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INV. 1898.

MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO, SATURDAY, JULY 5, 1879.

VOLUME XXXIX Number 1.

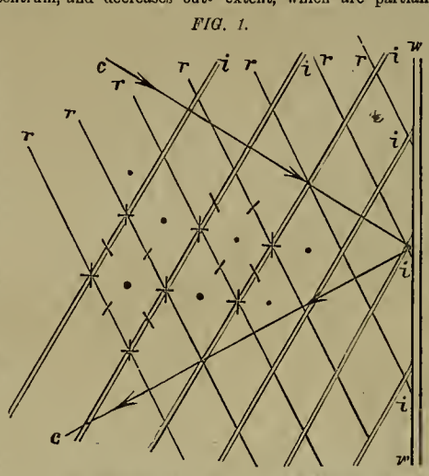
Earthquakes.—No. 2.

The most conspicuous example of a vorticose earthquake, in which the ground is twisted and whirled around and back, occurred in the great Calabrian earthquake of 1783. Blocks of stone forming obelisks were twisted one on another; the earth was broken and twisted, so that straight rows of trees were left in interrupted zigzags. Similar phenomena were observed in the California earthquake of 1868. Chimney-tops were separated at their junction with the roof, and twisted around without overthrow; wardrobes and bureaus were turned about at right angles to the wall, or even with their faces to the wall. These phenomena may be explained by the backward and forward motion common to all earthquakes—the sudden lifting up of one end by a forward motion, would swing around by the sudden backward motion. The concurrence and interference of earth-waves would produce the real vorticose motion. If two systems of waves of any kind meet each other, there will be points of concurrence where they re-enforce each other, and points of interference where they destroy each other. Suppose, for example, a system of water waves, represented by the double lines, *i*, *i*, (Fig. 1), running in the direction *b*, *b*, strike against a wall, *w*, *w*; the waves would be reflected in the direction *c*, *c*, and are represented by the single lines, *r*. Then, if the lines represent crests, and the intervening spaces the troughs, at the place marked with crosses and dots there would be concurrence, and, therefore, higher crests and deeper troughs, while at the points indicated by dashes there would be interference and mutual [illegible], and, therefore, smooth water. When two systems of earth-waves meet and [illegible] other, we must have points of concurrence and interference in close proximity. Ground, therefore, will be thrown into violent agitation—points in close proximity moving in opposite directions (twisting). If the motion be sufficient to rupture the earth, restoration not made by counter-twisting, and the [illegible] is left in a displaced condition. The cause of this interference lies in the different velocity of waves—as has been explained, an inequality in the medium. It is a noticeable fact that the most violent earthquakes, especially twisting of the ground, occur near the junction of the softer strata of the plains with the harder and more elastic strata of the mountains, as will appear from Fig. 2. From the point of the shock, *X*, suppose earth-waves to emerge at *a*, and run as a surface-wave toward the mountain, *m*. The waves, striking the hard, elastic material, *m*, would be partly transmitted and partly reflected. The reflected waves, running in the direction of the arrow, *r*, would meet the advancing incident waves moving in the direction of the arrow, *i*, and concurrence and interference would be inevitable. The hollow rumbling, rolling or grinding preceding and accompanying an earthquake are produced by the rupture of the earth at the origin, and by the passage of the wave through the variable elastic medium, being the sound produced by the breaking of the medium and the grinding of the broken parts together. Waves of every variety of size are transmitted, the great waves being sensible as shocks, jars or tremors, while the small waves which do not produce tremors are heard as sounds. The smaller waves running faster than the large ones, are heard first, and thus precede the shock.

Whether the direction of the earthquake be up and down, back and forth, or oblique, the observed motion is due to the position of the observer. At the outcrop the motion would be up and down, becoming oblique the further the observer recedes from the epicentrum, until at a great distance the motion is usually horizontal. The rocking motion is due to a series of waves which pass beneath the observer, waves similar in form to water waves.

It has been observed that in a certain zone, a considerable distance from the epicentrum, the destruction by overthrow is very great, and beyond it the effects speedily diminish. This zone has been called the circle of principal destruction or overflow. This depends not so much on the amount of oscillation as upon the horizontal nature of the oscillation. The oscillation or vibration is of course greatest at the point of first emergence, the epicentrum, and decreases outward. The oscillation increasing at the epicentrum and decreasing beyond that. Under the influence of these two contrary elements, there must exist a point or circle on every side of the epicentrum when the horizontal element will be a maximum. This is shown in Fig. 3, in which *a a*, *b b*, *c c*, etc., are the decreasing oscillation, and *b b″*, *c c″*, are the horizontal element. This reaches a maximum at *c*. It has been found by mathematical calculation, based upon the supposition that the whole oscillation varies inversely as the square of the distance from *X*, that the horizontal element will be a maximum when the angle of emergence is 54°, 44′. By determining by observation the circle of principal disturbance, it is easy to calculate the depth, *a*, *X*, of the forces, for it will be the apex of a cone whose base is that circle and whose apical angle is 70° 32′.

FIG. 1.



CONCURRENCE AND INTERFERENCE.

It has been noticed that shocks are sometimes distinctly felt in mines which are insensible at the surface, and again are felt at the surface and not felt in the mine. This latter has lately happened in our own mines, and may be explained in both cases by the elasticity of the strata, the depth of the impulses or obstacles that may have changed the course of the terrestrial undulations. In Fig. 4, *S*, *S*, represents the surface of the ground; *a*, *b*, hard, elastic strata, covered with loose, inelastic materials; *c*, *c*, earth, gravel, etc. Now, if a series of waves come in the direction of the arrows, *d*, *d*, and, passing through *a*, *b*, on their way to the surface, strike upon the lower surface of *c*, *c*, a portion would reach the surface by refraction, but a greater portion would be reflected and return into *a*, *b*, concurring and interfering with the advancing waves, and producing great commotion in these strata. Now, if the inelastic strata *S*, *S*, be located at the bottom of a mine, the same effect would be apparent, viz., the undulations would be reflected at the bottom of the strata, to reappear at the surface of the ground above the strata.

In the earthquake regions of South America there are certain favored spots, often of small extent, which are partially exempt from the shocks which infest the surrounding country. The wave seems to pass under them as under a bridge to reappear again on the other side. An inspection of Fig. 5 will explain the cause to be reflection from an under surface of inelastic strata. According to Mallet, the geological structure of the earth, the formations at the surface and below the surface, have nearly everything to do with the violence of the earthquake. Two cities may be near together, yet one would be totally destroyed by the shock, and the other entirely escape, or different houses may escape or suffer according to the strata upon which they rest. Immunity from earthquakes may be had, few, if any, human lives need ever be lost by earthquakes even in volcanic countries. There, earthquakes recur in their "times and seasons," and to be dealt with, like all human difficulties, they must be understood. The informed faculties and energies of a man may avert the evils of the earthquake, in like manner as all others incident to his estate, by his application of forethought, and knowledge to subjugate by skill, labor and observation.

FIG. 2.

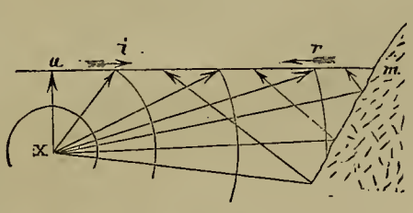


FIG. 3.

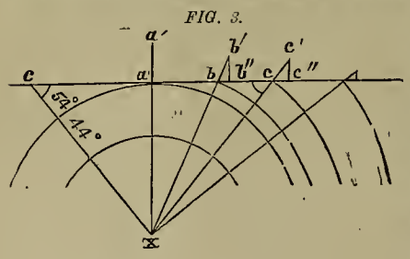


FIG. 4.

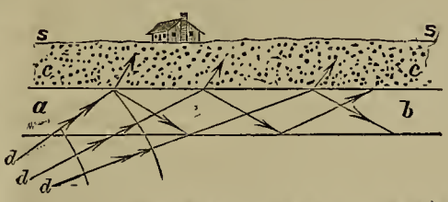


FIG. 5.

DIAGRAM ILLUSTRATING REFLECTION OF EARTHQUAKE WAVES.

PETROLEUM.—Crude petroleum went down to 63¾ cents a barrel, Saturday last, the lowest point ever reached at New York, and refined oil is worth only 7¼ cents a gallon. The average price of the crude product last year was $1.37 a barrel; the highest price ever paid was $20 a barrel, in 1860. The cause of the present depression is the enormous average yield of 54,000 barrels a day, against 50,000 in April, 48,000 in March, and 40,000 a year ago.

Mechanical Interests of the Coast.

There is no industry so intimately connected with mines and mining than the mechanical necessities of this coast. The immense deposits of precious metals continually being developed and discovered require the aid of perfectly working machinery such as can be properly furnished by our own manufactories. Recent statistics declare that the annual demand of the world for the precious metals now falls short by $160,000,000. The decrease of 20% in our own productions is felt not only here but in the East, and in seeking for the cause a cure has been proposed by Eastern machinery builders. It is a truth which every business man now knows, that Chicago and St. Louis are not only making strenuous efforts to compete with San Francisco, but notably in Arizona and Colorado have actually forestalled our markets. The facilities for manufacturing ought not to be greater in the East than here, besides our mining characteristics have developed a scientific knowledge of the needs of mineral regions, such as the Eastern manufacturer cannot possibly have except in theory. It certainly cannot be said that the intelligence or business policy of our coast is less than that of the East, yet with the enormous quantity of rich mineral within our reach and waiting for us to work it into bullion, the East steps in and proposes to monopolize a business which should be kept here at home. If the movement should be successful and trade in machinery be diverted from San Francisco, that interest here will languish and become subsidiary to the monopolizing tendency of Eastern manufacturers. Already Philadelphia sends her machinery to all quarters of the globe, taking advantage of our weakness for big trees and monstrosities in fruits and vegetables to undermine an industry which if not the only element of what is to glorify our future, is at least the main element. Floundering in the mud of stock gambling, the very foundation of our future prosperity is quietly slipping from under us, not without our knowledge, but without our interference. It is perfectly legitimate for us to fear whatever will tend to injure our present and future, and when we say that Eastern efforts are succeeding, we would inculcate the idea that unless we awake from our sloth and put forth such efforts as San Francisco alone knows how to put forth when aroused to the necessity of action, our slumber will be eternal in the direction of our mechanical interests.

The old pan and rocker idea of gathering the precious metals has passed into oblivion, yet it would seem as if the bullion product of our mines was believed to originate in the old-fashioned easy way. Expensive and perfect machinery is now required, and the whole world sees it, and seizes the advantage offered by a non-competing locality to our detriment. It may be useless to talk about this matter, for "no man is a prophet in his own country." The facts remain nevertheless that other manufacturers are gradually establishing a market which will draw to the East other industries, and deprive us of opportunities that are now within our reach and retention. It is not jealousy that induces us to point to the facts, but a laudable desire for local interests which all men feel. It is well to be cosmopolitan in talk, but then ideas do not build up trade and commerce.

SUB-TREASURER SHERMAN has shipped $17,000,000 in gold coin to the East as third-class mail matter during the past eight months. Lately the shipments have been made under a government frank, and without cost.

ADVICES from Guaymas indicate that the early building of a railroad from that point to El Paso or elsewhere is unlikely, the Mexican government preferring fighting to improving.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS

Shasta County.

EDITORS PRESS:—At Mad Ox, seven miles above Whisky Town, we find the quartz mill owned by Messrs. Grotafend, Brickford & Co., in fine running order, with its double turbine water wheel, from A. Myers, San Francisco. The mill is running day and night, the parties are confident of a good thing in their mine, which is well located with a large body of fine-looking quartz now in sight. The extension of this mine known as the Peckham mine, now owned by A. Saulan, Warfield, Scott & Co., is turning out a large amount of good quartz, worked by an arastra, pays from $100 to $140 per ton, ledge from 3 to 5½ feet in thickness.

On Mad Mule

Mr. Banghart is working his seam diggings very quietly, but with satisfactory results. Since 1866 he has his new tunnel in 500 feet, and is within a few feet of his pay chimney, or seam, which is very rich. Ex-Sheriff Jackson is working the extension with good prospects. The diggings have been very rich in the gulches in this vicinity in past years.

The Bell & Knox mine on Grizzly gulch, in same district, has yielded a large amount of gold during the past two years.

The mining interests around French Gulch are very encouraging. Messrs. John, Souter, Simes & Co. are getting the old Washington mill and mine in running order again, as they have found new bodies of ore. The quartz in this district is gold bearing. F. McConnell and H. Dorr have a fine prospect higher up the mountain, their ledge is between slate and porphyry, rock averaging from $40 to $70 per ton, worked by an arastra right at the mine. V. Kern is also running an arastra on the north fork of the creek with equally good results.

Passing over the mountain at an altitude of 4,100 feet (into Trinity county), we find Deadwood gulch, on which five arastras are now running—George Keine, two; G. F. Deiner, two; Waver Sebastian, one. Mr. Willey and Mr. Davis are also working very rich ore from their mines. Ores in this district run from $70 to $120 per ton, and some has run even higher than that. There is no doubt but this will prove a fine district, it is well located, formation slate and porphyry, the same as French Gulch district, and the gold of good quality. B.

Chrome Mines in San Luis Obispo.

EDITORS PRESS:—On the afternoon of Saturday last I had the pleasure of visiting with an acquaintance the "chrome" mines among the hills about eight miles distant. For about five miles the road leads through a picturesque valley, watered by a perennial stream which is fringed with a rich growth of grass and sycamore trees. In passing through we noticed evidences that more than one picnic party had practically appreciated the inviting shade. On leaving this valley we ascended the "grade," which is a road cut along the side of the mountain somewhat spirally, and is of just sufficient width for one team only; though there are "bays" here and there for the convenience of teams passing one another. Where the "grade" was steepest and narrowest, and in every uncomfortable way most suggestive, the hill bore nothing to which in an emergency one could cling but wild oats; above this there was a thick chaparral growth interspersed with pines and cedars; here too were some large manzanita bushes whose stems were 10 or 11 inches in diameter. Having attained the highest point, and seen four Chinamen just beginning a new mine, we returned, and on the way halted for water at the house of Mr. Louis G. Flores, of San Luis Obispo, who owns the mines and a large area of land. We were fortunate enough to find him at home, and he at once offered us his hospitalities. Having refreshed ourselves and the horses, Mr. Flores conducted us to his most productive mine. Here we found men at work in a tunnel running about 200 feet into a hill. Mr. Flores described to us the characteristics of the chrome ore, and pointed out the dips and leads of the various veins, and showed us one vein that had increased in breadth as the miners followed it, until it developed into a huge subterraneous mound of pure chrome. The ore is sorted, screened, and then hauled to the depot of the S. L. O. and S. M. V. R. R., whence it is taken by rail to Port Harford, thence to Baltimore by way of San Francisco. The only factory in the country, for using this chrome ore at present, is at Baltimore. The price paid at the depot here is $8 per ton, which, in the opinion of those qualified to judge, is not a sufficient compensation. We returned home after an enjoyable trip. C.

San Luis Obispo, Cal., June 16th.

Great Western Quicksilver Mine.

EDITORS PRESS:—Among the first, if not the first mine now being worked for mercury, is the Great Western, near Middletown, in Lake county, which has for several years been under able management of the experienced mining engineer, Andrew Rocca, now running a force of 250 men. The mine discharges the ores by tunnel and trains of horse cars right at the furnaces and assorting sheds. The tunnel for main discharge is now in a distance of half a mile. There is also a tunnel discharging through the mountain on the west side to another furnace there. The principal extracting of quicksilver is done by one fine-ore furnace of the capacity of 13 tons in 24 hours; and three coarse-ore furnaces, each of capacity of 35 tons in 24 hours. Of the coarse-ore furnaces, two are Greene's excellent furnaces; one of Coult's—patented in 1867 by Joseph Coult, then of Pope Valley, but now in Texas. This furnace gives the best, easiest and cheapest results; does not cost one-fourth as much as the others—$5,000 will put up two of them with condensers. The fine-ore condenser uses a Livermore condenser. Uses Hercules Giant powder as the best and safest—have tested all kinds—using about $600 worth per month; average about 160 shots or blasts each six hours.

Mr. Rocca is a progressive man and has introduced many new, original and practical ideas in his various machines. His glass-roofed condensers are proving a perfect success. The flow of metal from the furnaces has not ceased for the last three years, yielding 500 to 600 flasks per month, or about 7,000 to 8,000 flasks per annum, which is sent by freight teams to Calistoga depot at $6 per ton over Lawley's toll road. Men work 10-hour shifts between 7 A. M. and 6 P. M., and from 7 P. M. to 6 A. M.

The Sulphur Bank and Oat Hill mines are doing well, but not working up to full capacity. The latter mine is considered an excellent mine and under very successful management.

Dr. Baker, below the lake six miles, is doing well for the amount of capital now at his command. He claims some successful improvements in furnace and condensers, and deserves ample success for his great perseverance where capital was lacking. B. W. C.

Middletown, June 9th.

The Telluride Ores of Gold.—No. 4.

[Thesis by RUSSELL L. DUNN, College of Mines, University of California.]

Special Processes.

Smelting with copper ores usually more or less auriferous and argentiferous to a copper matte. This is the process employed at the Boston and Colorado works at present. When first introduced the Ziervogel process was used to part the gold and silver from the copper; this, it is said on account of the expensiveness of the chemicals employed, was abandoned. Since then a secret method, invented by Prof. Pearce, has been used, and is claimed to give better and cheaper results than any other yet applied. The Boston and Colorado works have treated the greater portion of the telluride ores of Colorado.

Smelting with auriferous iron pyrites to an iron matte. This process, so far as I have information, has never been used with telluride ores, though recommended.

Smelting with lead ores to base bullion is often used and seems to be fairly successful. Very rich ores are not usually treated by this method. The process is in use in Boyd's smelting works at Boulder City, Colorado, on ores too poor in gold and silver to be smelted in a lead bath. The base bullion can be refined and parted by the usual methods. As compared with the Copper Matte process described above, it is said not to give as high a percentage of return.

Smelting in a lead bath. Into a test of melted lead very finely pulverized ore is fed in quantities of from 10 lbs. to 15 lbs. at a time. The slag is skimmed off from time to time as it accumulates in excess; as soon as the lead is sufficiently enriched it is removed and a fresh charge of lead introduced. The refining and parting of the enriched lead are done in the usual way. The same lead can be used over and over again, the unrecoverable loss being small. This process is in use in Boyd's works at Boulder city, Colorado.

Mr. Boyd has patented what he considers an improvement by which the ore as it is fed into the test is forced beneath the surface of the melted lead and retained there until the tellurium minerals are decomposed and the tellurium driven off. Theoretically the principle seems good, how it works practically I am unable to say as accounts vary.

Rich ores are sometimes smelted in crucibles with litharge and reducing fluxes. A high percentage of metal is of course returned, but at a proportionately higher expenditure.

All of the crucible, and the cupellation lead bath process are quite costly, and with the exception of the latter only suitable as experimental processes on a small scale. None of them, except under favorable circumstances, can treat other than high grades of ore.

The matte processes are the best on a large scale. For them and for furnace processes in general the telluride ores should not be crushed too fine. At the Boston and Colorado works at Denver, the ore is crushed by steel rolls so as to pass through sieves of 10 holes to the running inch. For cupel and crucible processes the ore must be finely pulverized. The table will show where smelting is and can be applied.

Amalgamation.

Very little need be said about this branch of the metallurgy, as telluride ores will not amalgamate. Amalgamation is decidedly the best treatment for gold ores where it can be applied directly to metallic gold in a finely divided condition. No other method will yield so high a percentage of the gold in the ore at so low a cost. But mercury will not decompose tellurides so as to amalgamate the gold and silver in them. I am informed that the mercury cuts up and blackens, acting very much as with base metal chlorides and sulphates. In attempting to mill some extremely rich ore from the Stanislaus mine in California, it was found that only from 5% to 10% of the gold was saved; attempts since made in Colorado have succeeded no better.

Where there is much free gold and few tellurets and sulphurets in the rock, it is possible to crush the ore wet, run it through the amalgamation plant, and thence to concentrators which will save the tellurets and sulphurets and concentrate them to second class ore. I know of no instance in which this process is employed at the present time, and from general principles it is only to be recommended in the case cited above, where it is obviously more economical.

Roasting.

The roasting of telluride ores is the most interesting as well as the most important point in connection with their metallurgy. It is true that roasting is now practically abandoned on account of the large loss of metal by volatilization, but if some economical mode were discovered by which the ore could be perfectly roasted without loss, it would become used to the almost entire exclusion of smelting. Roasting is the only economical way of preparing mineralized gold ores for amalgamation. All kinds of furnaces have been tried on these ores, reverberatory, Bruckner's cylinders, and in fact almost every roasting device which the ingenuity of the metallurgist could invent, and thus far, none of them, judging from the length of time they were used, are more than partially successful at the best.

The principal reason why roasting has not been successful is the volatility of gold, and in a less degree silver, with tellurium and tellurous acid. Mr. Kustel, who in 1865 said that the ores could be roasted in a reverberatory furnace successfully, made some experiments on ores from Colorado a few years ago. He roasted them himself in the sulphuret roasting furnace connected with the chlorination plant at Grass Valley, paying the most careful attention to the rate of roasting and the regulation of the draft, and the best result he was able to obtain showed a loss by volatilization of 9%.

This peculiar volatilization of gold is one of the unsolved problems of chemistry. It is said to occur in roasting sulphurets, but some careful experiments by Mr. Kustel convinced him that in this case the loss was mechanical and caused by a too rapid roasting. Arsenic and antimony seem to have more or less of the same power (doubtful) of causing gold to vaporize. It is, however, most marked with tellurium. Whether the gold vaporizes as gold or volatilizes as a telluride of gold has not yet been discovered, but the latter supposition would seem to be the most probable, although it may be both. Gold is slightly volatile at high temperatures. A rather curious instance of this property occurred in the Boston and Colorado works at Black Hawk, Colorado, several years ago. In breaking up a hearth from a reverberatory furnace used for roasting iron matte, flakes and wires of pure bright gold were found in the quartz bed at some distance below the surface of the same. How the gold got there from above is a mystery even under the supposition (most probable) of vaporization and condensation.

It is necessary that telluride ores should be crushed dry and very fine for thorough roasting. The usual plant for roasting and the method of carrying on the process are the same as are used for roasting ordinary auriferous iron pyrites, only considerable more attention must be given to the manipulation, as the roasting is much more delicate. As the ordinary roasting furnace is well known, it is not necessary for me to give any description of it.

Willard's furnace is peculiar both in construction and manner of working. Heat is applied to the exterior by a fire underneath, and the roasting goes on inside supported by sawdust or some other finely divided carbonaceous matter which is mixed with the ore. A blast is used to supply air to the inside of the furnace. The roasted ore can be treated in three ways, viz., dry amalgamation, wet amalgamation and chlorination. By the first more or less gold and floured amalgam are unavoidably lost. The fineness of division of the gold and silver is so extreme that the particles are liable to remain suspended in water and pass off with the slimes in wet amalgamation. By chlorination the silver is of course lost unless another process be subsequently employed to save it.

Roasting processes as a rule can treat equally well all grades of ore, but the richer the ore the more careful should be the manipulation.

Chemical Processes, Etc.

Under this head I include all of the so-called wet processes which have or can be applied in reducing telluride ores. I can learn of no instance in which any of them have been applied on a large scale as practical processes. Acids have been used to dissolve out the tellurium, after which it was easy to extract the metal. Such processes are, however, far too costly for any but the richest ore.

Mr. Stewart made some experiments, or rather tests, with his modification of the Hunt and Douglas copper reduction process, at Georgetown, Col. They were on a small scale, but he claims successful. His process will treat ore of any grade without previous roasting.

Concentration.

It is found unprofitable to work low grades of these ores by smelting raw, and it is therefore necessary to concentrate first. By concentrating it has been made possible to reduce all rock coming from the mine with as low a value as $15 or $20 per ton.

The thorough concentration of telluride ores is somewhat difficult. Owing to the complete dissemination of the small particles of mineral the ore must be crushed very fine, and then of course more or less will be lost in the tailings and slimes from the machines. Also in crushing fine, the brittle mineral is powdered, while the gangue remains in comparatively large particles—that is, the gangue and mineral are not crushed equally, thus making a preliminary sizing of the crushed ore necessary, with the use of the usual machines. It can be readily seen that the German methods, sieving and jigging, are not applicable to such fine ore. The ordinary modes of concentration employed in California and on the Pacific coast for sulphurets are much better. Buddles, cradles and blanket-boxes all do good work, though by no means as perfect as can be desired. A machine has been in use in the last few years in the Telluride district of Colorado, which seems to do better work than any of the others. It is called the Frue Vanning machine or ore concentrator. It consists of an endless rubber belt moving upward by the revolving of the rollers on which it is stretched. A rapid lateral vibration is given to it by steel springs. The ore and water are fed continuously on the surface, and the tailings discharged at the foot, while the concentrations are washed off in a box filled with water, through which the belt travels. The machine is perfectly automatic in action, hand labor only being required from time to time to remove the concentrations.

As regards the absolute efficiency of these machines (*i. e.*, the percentage of the mineral in a given grade of ore they will save), accounts differ. The last described would seem to be the best, as the others have been discarded almost entirely for it. Even it, however, would not seem to be all that is desired, from the fact that it will not treat economically as low grades of tellurides as of other gold ores.

Very little more remains to be said of the beneficiation, except to note that there is still room for improvement. It has been noticed by smelters that certain fluxes, more particularly limestone, seem to reduce the volatilization of the metal, and it is possible that some substance may yet be found which will have the same influence in the roasting furnace. In wet processes we may find the true method of working these ores, but roasting, with amalgamation or chlorination are at present the most available for improvement.

[Concluded.]

The Treatment of Auriferous and Argentiferous Pyrites.

The trouble experienced in dealing with "sulphurets" is so well known that it will be unnecessary to say that every new method which will serve to reduce the cost and the losses of extracting gold, silver and copper from ores running high in pyrites, deserves attention. A recent modification of known methods is that proposed by Mr. W. A. Dixon, who has made a series of experiments to test its value, so far as laboratory work can accomplish that object. He roasts the ore on a matte smelted from the ore in a muffle roasting furnace, and utilizes the sulphurous acid formed for the manufacture of a dilute sulphuric acid, in suitable combination chambers and condensation towers. Any arsenious acid formed is deposited in a flue previous to the gases entering the combination chamber. So far the process does not in any way differ from existing methods. Before being discharged from the muffle furnace the roasted ore is mixed with a proper amount of coal dust or any other carbonaceous matter, and then it is transferred to a reverberatory furnace, in which a reducing flame is maintained. This reduces the oxides, formed in the preliminary roasting, to metals. The material is then carried into vats, where a large portion of the iron is extracted by means of the acid solution from the towers in the shape of a sulphate. The residue, which contains free gold and silver, is amalgamated. If copper is present in considerable quantities, the process is somewhat modified. The ore, after having been roasted in the muffle furnace, is lixiviated with an acid solution of copper, and then with water. The residue is mixed with carbon and treated further in the manner described. The process is claimed to possess the advantage of suffering less from poor roasting and of being conducted at a low temperature, with its attendant decrease of cost of fuel, of plant and of loss by volatilization. There is none of the expense connected with chlorinizing roasting nor any outlay for precipitants.—*Iron Age.*

MECHANICAL PROGRESS.

Cable Towing.

The Belgian cable towing system, which has been used for years on the canals and rivers of Europe, and which has given very satisfactory results on a short section of the Erie canal, is now about to be introduced on this water-way on an enlarged scale.

The following are the special features of this system: There is provided first a wire rope, which is laid down along the bottom of the canal the whole length of the course, and attached at both ends. The tow-boats (or tugs), each of which is to draw its fleet of boats, are provided with engines for giving motion to the peculiar feature of the system, namely, the device known as the "clip pulley." This is a large drum provided on its periphery with a series of movable jaws, forming a continuous groove for the reception of the wire rope. These movable jaws are so contrived that they successively close upon the wire rope as the drum revolves, and clutch it with a force directly proportioned to the amount of strain brought upon the rope by the weight of the tow. Any slipping of the cable is thus prevented—the tightness of the clutch of the pulley being automatically regulated by the amount of the load. In operating the system, the cable is raised from the bed of the canal, placed in the groove of the drum, which (provided with suitable guiding and tightening pulleys) is usually placed on the deck of the tug near the bow, and the engine being started, the tug pulls itself along, and its fleet of boats in tow, by means of the cable, which it draws up at the bow, and pays out over the stern, where it falls again to its place at the bed of the canal. The record of the short section of 42 miles, from Buffalo to Middleport, which has been tried in this country, is reported to have been most satisfactory. The speed "was three times greater than the average of animal power, although seven times the amount of freight was hauled by the cable-boat." The largest tow consisted of seven canal-boats, loaded with 1,499 tons of coal, the equivalent of 150 car-loads, and the mechanical operations of the drum is pronounced to have been in every respect admirable.

Electric Car Signal.—A trial will soon be made of a new signal recently patented by Mr. I. A. Sherman and Mr. C. E. Mees, of Louisville, Ky. The first named gentleman is an accomplished electrician, and connected with the Louisville & Nashville railroad. The invention consists in combining a signal device upon the locomotive with two conducting wires extending through the cars of the train, and terminating at the end of each car in adjacent contact plates, forming seats, together with a flexible cable having two insulated wires terminating in metal plates separated by a soft rubber block, to continue the circuit, but permitting it to be broken when the cars separate, and transmit a signal to that effect to the engineer. It can be applied to freight as well as passenger cars. The cost will be something more than that of the system now generally in use.—*Nat. Car Builder.*

Apparatus for Feeding Boilers.—Signor Chiazzari, of the Alta Italia railway, has recently described a new apparatus for feeding the boilers of locomotives and other non-condensing engines with water heated to within a few degrees of the boiling point. The apparatus consists in bringing the feed-water in a finely divided spray into contact with a portion of the exhaust steam during its passage through the feed pump, and of an automatic arrangement for shutting off the supply from the tender the moment the regulator is closed, thus preventing the admission of cold water to the boiler. Mechanically, the pump appears to be successful, as it has worked without trouble since January, 1876. Economically it seems to have answered, for the saving in fuel, in a trial of four months, is said to have been very large.

A new process for the production of a superior artificial stone is described to consist of the employment of a thorough mixture of six parts of fine sand and one of slacked lime, which is exposed for about three days to a high temperature under a pressure of some three atmospheres. The result is affirmed to be the partial decomposition of the silicious particles with the formation of silicate of lime, which acts as a cement, so that the mass, when cooled down to the ordinary temperature, hardens. This hardening process is said to continue for some weeks after exposure to the air, and the final product is declared to be as hard and solid as good sandstone.—*Mining Journal.*

Gas Engines.—The introduction of gas engines, says the *Engineer and Mining Journal*, has attained to remarkable dimensions in Germany and England (especially), where engines of this class, as high as 30 to 50-horse power have been built. Mr. Robert Grimshaw, reporting upon a recent visit to the Gasmotorenfabrik, Deutz, notices that a 50-horse power gas engine, for a beet-sugar factory, was in course of construction there. The gas companies, in view of large consumption, furnish gas at very reduced rates for such engines.

The Latest Telephone.—At a recent meeting of the Society of Telegraph Engineers in London, an interesting feature was the disclosure made by Major Webber, R. E., to the effect that he had recently experimented with a remarkable new carbon telephone from America, which owed its power to a diaphragm of animal tissue. With this instrument, which was not further described, Major Webber was able to speak in a low tone over 70 miles of wire with perfect clearness. A part of this line consisted of underground cable, in which from 20 to 30 other circuits were busily at work without interfering with the telephonic message. The voice of this instrument was singularly full and lifelike, whereas that of magneto-telephones is peculiarly thin and parrety. This experiment is completely cast in the shade by the successful working of an ordinary telephone perfectly through 195 miles of wire. This was accomplished by Lieut. Reade, of the United States Military Telegraph, between San Diego and Fort Yuma. The old-fashioned telephones of years ago had a diaphragm of animal tissue and could be used at remarkably long distances without any magnetic current at all. It is now very certain that the power of the telephone to transmit vibrations does not depend on the diaphragm so much as upon the medium which transmits them, and even now diaphragms are being dispensed with. So Major Webber has not discovered anything very new or curious.

European Stoves.—In Russia, Sweden, Norway, and all Northern Europe, stoves are usually built of brick, covered with porcelain and placed while building in the house. They are of the size of a large and very high chest of drawers, and usually stand in the corner of the room. The fire is burned in a furnace near the bottom, and the heated smoke is made repeatedly to traverse the structure from side to side, along a winding passage, before it reaches the top, where a pipe conveys it, now comparatively cold, into a flue in the wall. The heated mass of brick continues to warm the room long after the fuel is burned. It is generally sufficient to warm the stove once a day. The same quantity of wood or turf burned in an open grate would be consumed in an hour, and would hardly be felt. There is one of these stoves in every room.

Wirebound Sheaves and the Millers.—The millers of the Western States of America have set themselves against the use of wire-binding reaping machines on the ground that the wire gets into the flour and offal, and injures the milling machinery. The Minnesota millers have agreed not to buy wheat that has been bound with wire, except at a reduction of 10 cents per bushel. As nearly all the self-binding reapers of America bind with wire, this proposed action of the millers is a serious one for the farmers, and for the makers of the American sheaf-binding reaping machines. It is doubtful, however, whether they will have power to carry it into effect. No string-binder has yet been uninterruptedly successful in ordinary field use, though two or three are now before the public, and will probably be perfected after another harvest.

Car Heater.—Mr. John Somerset, of Manchester, Eng., has invented a heating apparatus for railway carriages. Inside the smoke-box of the locomotive is a coil of pipe connected with a trumpet-mouth in front, so that as the engine travels, a current of air is forced into the coil, where it is heated and conveyed by pipes to the train. Each carriage is fitted with a series of pipes passing under the seats of the several compartments. The connection between the engine and first carriage, and between the other carriages, is by means of a telescope sliding tube and ball and socket joint, so that the train can expand and contract and pass curves without breaking the connection. The rear end of the tube is open, so that as the train travels, a continuous current of hot air passes from one end to the other.—*Car Builder.*

Working Steam at High Pressure.—It is well known that great efficiency in steam engines is obtained by an increase of pressure and the use of expansion. To accomplish this, the point lies not so much with the engine as with the boiler, engineers finding no difficulty in working an engine with steam at 150 to 200 pounds per square inch; therefore Mr. Walt, an eminent Liverpool engineer, thinks there is no limit to the practical working pressure. Some engineers will be inclined to differ with this opinion, as the management of steam used expansively in simple reciprocating engines at ranges of pressure much exceeding those named, is considered by many risky practice.

Steel-faced Iron Plates.—A cast-iron mold is divided into two sections by means of a transverse plate of thin sheet iron. The two metals are then poured into the respective compartments. The sheet iron partition prevents the mixture of the metals and facilitates the welding by itself being brought into a state of fusion. It is said that the product is well adapted for safes, and that it resists drills.

Soft Steel being used for Tin Plates.—A correspondent of the London *Mining Journal*, who appears to be well informed, states that very large quantities of tin plates made from steel are branded charcoal and best charcoal, and so exported, and these plates, he affirms, are exceptionally well received, especially for stamping purposes, in the United States.

SCIENTIFIC PROGRESS.

Centrifugal Force and Fly Wheels.

It is not always that practical men are willing to admit the value and importance of scientific knowledge as regulating the operations and accidents of a workshop. We had a valuable incident of the kind that forced itself upon our notice, says a foreign contemporary, a few days back. A large pulley or rigger, three feet in diameter, and very wide, was split across its rim by carelessness in unloading; at the same time it was noticed that two of the arms out of six were cracked by contraction in cooling. In order, however, to save expense it was proposed to patch the broken rim of the pulley with wrought-iron plates, which was done. *Per se*, the iron plates were stronger than the original casting, but the whole weight of the patch amounted to about 15 pounds. As the pulley revolved at the rate of 600 revolutions a minute, this unbalanced weight on the rim became by calculation as much as 7½ cwt. radial force outwards. This scientific result was brought to the knowledge of the practical men, but they could not see why the pulley would not do very well if the patch was as strong as the rest of the rim. The pulley was accordingly run under protest, and hardly had the maximum speed been attained before the pulley flew in pieces, and might have been dangerous to life and limb. The pulley, undoubtedly, broke, as above indicated, by centrifugal force, which, by the unbalanced patch of 15 pounds, caused a breaking radial pressure outward upon the broken rim at the position of the patch of 7½ cwt. This was quite sufficient to break the rim outward with enormous force, so that the pieces flew about the shop like fragments of a bursting shell. It will be well for machinists to remember this incident when they have occasion to repair fly-wheels.—*Scientific American.*

Underground Telegraphing.—Two systems have been proposed. In one, known as the Alberger plan, tubes of glass are prepared of a convenient length and about one-eighth inch internal diameter, in which a steel wire is introduced. This compound tube is then inserted in an iron one, the whole brought to a welding heat in a furnace, and then rolled, reducing the iron pipe so as to make a solid mass of pipe, glass and coating. The coating of iron acts as a shield and an arrester of induced currents. The wire being perfectly insulated is capable of working to a higher capacity and with less resistance than any other system. The wires are buried in the ground, a battery attached to the first piece of pipe and the pieces connected by the ordinary telegraphic tie—testing with a galvanometer as the work progresses. A bell-shaped sleeve somewhat larger than the pipe is drawn over each joint when connections are made, and an insulating fluid poured into the sleeve through an orifice in the center, thus making a joint impervious to moisture and perfectly insulated. The second system is the invention of David Brooks, the well-known electrician. The wires wrapped in cotton, 20, 30 or more are placed in an iron pipe, and after being laid in the ground oil is introduced and allowed to run its entire length, the source of supply being an elevated vessel always kept full so as to keep a constant pressure on the oil already there. These pipes have been laid in Philadelphia. The strong point in their favor is economy. Any number of wires may be enclosed in a small space, while the work of laying them does not involve much expense. Once in place they are free from disturbances of all kinds.

Prehistoric Remains in Oregon.—The coast of the Pacific ocean some distance below the mouth of the Columbia and above, even to the colder latitudes, shows in its shell mounds or beds evidences of a dense population that must have long ago lived and thrived on the bounteous sea-food that the ocean provides. Up the little streams and inlets may these beds also be found. Excavations made at Clatsop beach, Oregon, show a depth of six feet of shells, human bones and skulls *without* having reached the original dirt stratum. The length of this bed is unknown and its age can only be imagined. It is in shore half a mile, and in ancient times must have been the beach proper. Ages have passed since these wild people encamped by the booming waves, for immense old firs, five and six feet in diameter, are growing over the giant trees that preceded them. No implements of any kind have as yet been found in these beds. It is said that similar beds are found on the Alaska coast, also remains of ancient junks.—*American Antiquarian.*

Location of the Garden of Eden.—Of the four rivers which encircled the Garden of Eden in Genesis, the Phrat and Chiddekel have long ago been identified as the Euphrates and Tigris. A cuneiform monument in the British museum has a series of geographical names, and among them occur Pisan and Guchan, both canals of the Euphrates. Pisan was a canal running south of the Euphrates, and in the epoch of Alexander the Great, went under the name of Pullakopas canal; it is the Pisan or Pischon of the Bible, and Guchan is the Gihon. The Hebrew people had therefore placed the cradle of the human race in the vicinity of Babylon.

Fuel-Gas from Water.

Much attention has recently been directed to the Lowe & Strong processes for producing a cheap gas by the decomposition of water, which in the form of steam is brought in contact with incandescent carbon. The experiments that have lately been made in Sweden and Russia have been attended with favorable results, and several scientific men, some of them government officials, declare "that the gas has by us been employed for welding wrought iron, for smelting in crucibles as well as pig iron as steel; that the results of these experiments have been very satisfactory as to the heating power of the gas. On the other hand, we can confirm the statement that the employment of the gas for cooking purposes causes extraordinary saving in the household department, and that the cleanliness and convenience of its use must make it a favorite with all housekeepers."

The gas was used in a small baking and roasting stove, which required a gas consumption of only fourteen feet an hour, maintaining a constant heat of 275° centigrade.

For illumination the gas was conducted through a vessel filled with cotton moistened with benzine, and the result was eminently satisfactory.

Telephones without Diaphragms.—M. Ader reports some experiments confirmatory of the views of Du Moncel, upon telephones without diaphragms. He has often observed that the reproduction of words and sounds, which are occasioned by the interruption of currents, can be made in these telephones with a different quality, and upon a higher or lower pitch, according to the degree of tension which is given to the iron wire; but if the fundamental sound of the wire is muffled by holding it between the fingers, the sounds which are reproduced become dull, a little more feeble, and always in the same tone. He concludes from his experiments, that the sounds which are produced by a magnetic nucleus are probably the result of shortenings and lengthenings of the wire, determined by rapid magnetizing and demagnetizing, the molecular vibrations of the magnet producing the effects of the telephone, and the iron diaphragm only strengthening the vibrations, and rendering them more sensible to the ear by its own vibrations. We know it is possible to replace the iron plate of the receiver by non-magnetic substances, as a plate of copper, glass, wood and even card-board. The magnet does not exercise any particular action upon the diaphragm. The mistake was not in the fact but in the cause, the substance of the diaphragms receiving the molecular vibrations and communicating them to the ear.

The Heliograph.—Devices for signaling, very similar to the heliograph or "sun writer," have been in use for ages. As far back as the Persian invasion of Greece, polished metal surfaces were used to flash the rays of the sun and give warnings of one kind or another. The signaling in this and other cases was, however, imperfect, and could not be carried on over a space of more than 18 miles. But the instrument now in use, the Mance heliograph, is a great improvement, for it not only concentrates the sun's rays but it flashes them with the utmost precision to any required spot, irrespective of the relative location of the sun. It is also provided with a finger key, so that flashes may be made of long or short duration, thus permitting the employment of the Morse telegraphic alphabet. Under favorable conditions intercourse has been carried on through the medium of two of these instruments over a distance of nearly 100 miles, and at several points occupied by the English army in Afghanistan, regular communication is maintained at distances of not less than 50 miles by heliographic signals. The instrument weighs only seven pounds and can be carried and worked by one man. It is, of course, useless in cloudy weather. It has already been proposed to establish a systematic telegraphic communication between various islands in the West Indies by this process, and before long it will be adopted as a means of signaling between vessels when at sea.

New Use for Paper.—A great diversity presents itself in the various useful purposes to which paper, or *papier mache*, has been applied of late years. Besides ornamental articles, clothing, bedding, stamps, boxes, barrels, picture frames, furniture, stovepipes, chimney-pots, bricks, partition walls, carriage and car wheels and boats, it would seem as if the inventive ingenuity of manufacturers has succeeded in adapting this single substance to some new use every day. The last remarkable application of *papier mache* is the manufacture of a revolving dome for the astronomical observatory of Prof. Greene of the Polytechnic Institute at Troy. This dome has an internal diameter of 29 feet, and if constructed in the usual manner, would weigh five or six tons and require powerful and complicated machinery to manipulate it, besides also requiring foundations of considerable depth for its support; whereas the total weight of the paper dome will not exceed a ton and three-quarters, and, mounted on pivots working in iron grooves, is capable of being revolved in any direction required without the assistance of any machine or apparatus of any kind. The paper is put upon a light framing of wood, and is, by means of a special preparation, rendered fully as hard and even more rigid than wood.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending June 11		Week Ending June 19		Week Ending June 26		Week Ending July 2.	
Alpha	32½	28¾	29½	23	30	25½	28	24
Alta	11⅞	9⅝	10	8⅛	8⅝	6⅝	10⅞	6⅞
Andes	1⅛	80c	1.15	65c	1	75c	1.45	90c
Alps	....	....	....	....	....	....	....	....
Argenta	1½	1	1.15	1	1.20	1	1.05	1
Atlantic	45	35c	50c	....	35c	30c	35c	30c
Aurora Tunnel	....	....	40c	....	70c	40c	1	60c
Baltimore Con	1.30	1	1.30	50c	75c	....	....	....
Belcher	7⅝	5½	6⅝	6¼	7	6¼	6⅜	6
Belmont	75c	65c	65c	60c	30c	....	40c	35c
Best & Belcher	21	19	19	17½	19¼	17¾	19	17½
Bullion	11⅜	9½	8⅝	7¼	9¼	7⅜	8	7⅜
Bechtel	2	1.70	2	1⅞	2.15	1.65	2.30	1.95
Belle Isle	1.40	1.15	1.55	1.35	1.70	1½	1.60	1.45
Bodie	45	41	46½	38½	42	20½	24½	22½
Benton	8⅞	7¼	7	6	6	4¼	7⅜	5¼
Bulwer	12¼	11¼	12	10	10	9	10	9
Boyle	....	....	....	....	....	....	....	....
Black Hawk	3	2	2½	2	2.60	2.10	2.15	2
Belvidere	2.10	1.55	2.10	1⅞	1.90	1.60	1.95	1⅞
Booker	1.10	70c	1	90c	1.60	1	1.40	1
Caledonia	4½	2.65	3.15	2.60	2.80	2½	2.60	2½
California	7¼	6¼	6⅜	5⅞	5⅜	5¼	5⅜	5¼
Challenge	3.40	3	3	2.85	3.05	2.90	2.95	2.80
Chollar	9	8¼	8⅜	7⅜	9	7¼	8⅜	7⅝
Confidence	16⅜	15	15½	14⅜	16	14	16⅜	13½
Con Imperial	2.35	1.90	2.20	1.70	2.20	1.80	1.90	1.70
Con Virginia	7	6⅜	6½	5	5⅜	5¼	5⅜	5¼
Crown Point	6⅝	5½	6	5⅜	5⅜	4½	4.80	4¼
Con Washoe	30c	....	40c	....	55c	45c	....	....
Champion	50c	25c	70c	50c	50c	40c	65c	60c
Concordia	....	....	....	....	....	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	10c	5c	10c	5c	5c	....	25c	5c
Daney	....	....	....	....	....	....	....	....
Day	45c	30c	45c	40c	....	....	35c	30c
Eureka Con	17	15¼	17	15¼	17	15¼	17	16½
Exchequer	12	9⅝	9⅜	7½	9	7½	8	7⅜
Endowment	35c	25c	....	....	25c	....	35c	30c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	4	3.60	4.20	4	4.05	3.80	4	3½
Gila	75c	65c	80c	75c	1.55	90c	1.30	95c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	14	12	14	....	15⅜	....	14	....
Goodshaw	75c	50c	80c	70c	70c	60c	....	....
Gould & Curry	13⅝	11⅞	12¼	11¼	13½	11⅞	12¾	12
Hale & Norcross	18	17	17	15½	18½	15⅜	18	16
Hillside	2.95	1.90	2	1.90	1.90	1½	1⅞	....
Highbridge	35c	25c	60c	25c	30c	....	25c	15c
Homestake	....	....	....	....	....	....	....	....
Hussey	10c	5c	10c	5c	10c	5c	25c	20c
Independence	3⅞	5	3.10	2.90	2.90	2.60	2½	2¼
Julia	5½	4½	4.80	4.30	4.35	3.90	5.40	2⅜
Justice	4⅞	4.30	4.10	3⅞	4.20	3½	4.90	4
Jackson	5⅛	....	6	5⅝	5½	....	5	....
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	5⅞	5	5½	5	5½	5	5	4.60
Kossuth	....	....	20c	15c	20c	15c	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	1.45	1⅛	1.35	1.20	1⅜	1⅛	1.30	1
Lady Wash	3	2	2.40	1.90	2.30	1⅞	2.85	1.60
Leopard	80c	65c	1	....	1.20	1.05	1.10	1
Leviathan	75c	70c	75c	70c	60c	70c	75c	70c
Leeds	1	50c	1	70c	90c	75c	....	....
Lee	....	....	....	....	....	....	....	....
May Belle	50c	30c	40c	25c	75c	50c	70c	45c
Modoc	1¼	1	1¼	1	1¼	1	....	....
Manhattan	2⅝	2½	3	2½	2⅜	2½	3	2½
Martin White	6½	6	6⅞	6½	7	....	7	5¼
McClinton	1⅝	1.20	1.65	1⅛	1.60	1½	1½	1.40
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	45	39	39½	33	32½	26½	27⅜	26½
Mides	1½	....	....	....	....	....	....	....
Morning Star	3	....	....	....	3	....	....	....
North Con Virginia	9½	8⅜	9	8	8⅞	8½	9½	9
New York	1½	90c	1.15	80c	95c	65c	90c	65c
Northern Belle	6⅞	6½	6⅞	5	6	5⅞	5⅞	....
New Coso	....	....	25c	....	20c	....	20c	....
Navajo	45c	35c	50c	45c	45c	40c	40c	25c
Occidental	1	85c	1	75c	1	85c	1	80c
Ophir	36⅞	32½	34½	32	35	31	31⅞	30½
Oriental	75c	70c	75c	50c	85	45	40c	25c
Overman	12½	10⅞	13	11¼	12½	10	11⅜	10½
Panther	....	....	....	....	....	....	....	....
Phenix	2½	....	3½	3	3½	3½	3	2.90
Phil Sheridan	90c	50c	90c	60c	80c	65c	75c	60c
Potosi	7	5⅞	6½	5½	6⅜	5½	6	5½
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	5	4½	4⅞	4½	5¼	4½	4	....
Richer	65c	60c	75c	55c	85c	70c	1½	95c
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	16⅞	15¼	16	14⅞	17⅞	15	17	15½
Seg Belcher	28	25	28	24	....	....	....	....
Sierra Nevada	56	48	48	43	48	43½	46⅞	43
Silver Hill	3	2.40	2½	2	2½	1.80	2.20	1.80
Silver King	....	....	8	....	7	....	8	7
Silver Prize	....	....	....	....	....	....	....	....
Succor	90c	70c	80c	50c	1½	6c	15c	10c
Summit	2¼	2	2½	2¼	2.80	2	2½	2.30
Scorpion	3.40	2.10	2.90	2⅛	2.90	2½	2½	2
Solid Silver	20c	10c	45c	10c	45c	40c	45c	40c
South Bodie	45c	40c	45c	40c	45c	40c	45c	35c
South Standard	50c	20c	35c	25c	30c	25c	25c	20c
Star	40c	35c	40c	25c	40c	25c	40c	25c
St. Louis	50c	....	....	....	....	....	....	....
Syndicate	5	3½	5½	4.90	7	6	8⅞	6
Tioga Con	4	3	3.95	3⅞	5⅞	4.95	7⅞	6⅞
Tiptop	1⅝	95c	1½	1⅛	1⅛	1.15	1.15	1.10
Trojan	35c	30c	35c	25c	35c	25c	25c	....
Union Con	99	75½	79	63	61	43	45	40½
Utah	28	23	23	21½	22¼	21	22	20
Vermont Con	....	....	....	....	....	....	....	....
Ward	2	1⅛	1⅜	1⅛	1.60	1½	1.65	1½
Wells-Fargo	40c	25c	25c	20c	20c	....	....	....
Woodville	40c	30c	40c	30c	50c	30c	30c	25c
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	21⅞	20½	20	18⅜	19⅜	17	17⅜	17

Sales at S. F. Stock Exchange.

Friday A. M., June 27.
120 Alta 6⅞
450 Andes 95@90c
10 Alpha 24
270 Belcher 6¼@6⅛
255 Best & Belcher 17½
390 Benton 5¼@5⅜
420 Bullion 7⅜@7⅛
110 Con Virginia 5⅜@5½
200 Chollar 7⅞
75 California 5½
100 C Dorado 1.70
130 Crown Point 4.80@4⅞
760 Con Imperial 1.80@1.70
85 Confidence 14
250 Caledonia 2½
490 Challenge 2.90
450 Exchequer 7⅞
500 Fairfax 1¼@1.15
350 Flowery 50c
270 Gould & Curry 12¼@12
120 Hale & Nor 16
420 Julia 4@3.90
220 Justice 4.10@1.15
10 Kentuck 5
100 Leviathan 75c
210 Lady Wash 1.60@2
1380 Lady Bryan 1.30
705 Mexican 26½@26¼
220 Mackey 1¼
220 New York 75@65c
30 North Con Vir 9
655 N Bonanza 1½@1.60
160 Ophir 31½@31
50 Occidental 95c@1
70 Overman 10⅞
670 Potosi 6½@5⅞
280 Savage 15¼@15½
520 Sierra Nevada 44@44½
310 Silver Hill 1.80@1.95
1350 Succor 15c
350 S Potosi 75@80c
330 S Utah 25c
200 Solid Silver 40c
180 Scorpion 2.30@2½
330 Trojan 25c
765 Union Con 45@44½
115 Utah 22@21½
100 Woodville 25c
355 Ward 1.60
50 Yellow Jacket 17

AFTERNOON SESSION.
750 Adenda 90@75c
50 Argenta 1.05
890 Aurora T 1
1475 Belle Isle 1.45@1½
290 Bodie 23
20 Bulwer 10
150 Belvidere 1.90@1.95
1320 Bechtel 2@1.95
1420 Booker 1.30@1.40
500 Black Hawk 2.15@2.10
100 Belmont 35c
145 C Pacific 7
2300 Crœsus 10@15c
1500 Champion 50c
1145 Dudley 2.10@2.20
1430 DeFrees 5c
2140 Defiance 1½
200 D Standard 1.15
400 Endowment 30c
100 Fourth July 60c
345 Gila 1¼@1.15
300 Grand Prize 4
200 Glyon Dale 70c
200 Hussey 25c
200 Highbridge 25c
500 Independence 2¼
1100 Jupiter 2.40@2½
30 Jackson 5
100 Leopard 1.10
150 Manhattan 2½
110 Mammoth 13
280 McClinton 1.40@1½
205 Mono 10½@10
20 Martin White 6½
170 May Belle 50@45c
250 New Coso 20c
1070 N Noonday 2@1⅞
100 Noonday 3⅞@3.95
200 Oriental 25c
2000 Orient 50c
350 Paradise 1.70@1.65
950 Queen Bee 95c@1
390 Raymond & Ely 4
45 Real del Monte 1½
50 Red Cloud 75c
650 Richer 95c@1
250 Star 40c
1065 Summit 2½
385 Syndicate 6
400 S Standard 20c
1150 S Bodie 35@40c
885 S Bulwer 1.35@1¼
20 Silver King 7½
125 Tuscarora 10@20c
490 Tioga Con 7½@6⅞
100 Tiptop 1.15
1575 University 65@70c
500 Vortex 75@80c
10 Wales 2½
50 W Pacific 40c

Saturday A. M., June 28.
700 Alta 6⅝@7¼
480 Andes 95c@1
50 Alpha 26@25½
50 Argenta 1.05
550 Aurora T 90c@1
1320 Adenda 75c
270 Best & Belcher 18⅛@18⅝
540 Belcher 6¼@6
680 Bullion 7⅞@8
60 Benton 5¼
250 Belmont 35c
1340 Bodie 24@24½
500 Black Hawk 2.10@2
1020 Bechtel 2@1.95
370 Belvidere 1⅞@1.80
690 Booker 1.40@1⅛
280 Bulwer 9¼@9½
1500 Belle Isle 1.45@1.60
145 California 5¼@5⅝
225 Con Virginia 5⅜@5½
450 Chollar 8¼@8⅜
560 Crown Point 4⅞@4.65
80 Confidence 13½@13⅞
970 Con Imperial 1.90@1.85
365 Caledonia 2¼@2.60
35 Challenge 2.85
300 Con Dorado 1.70
1200 Champion 60@50c
30 C Pacific 7@7⅛
2000 Crœsus 15@20c
20 Caledonia (B H) 3⅞
100 Chieftain 10c
1215 Dudley 2.20@2¼
1750 Defiance 1½
25 D Standard 1⅛
395 Exchequer 8@7⅞
150 Eureka Con 16½
100 Endowment 30c
190 Flowery 50c
340 Gould & Curry 12¼@12½
810 Gila 1.15@1.30
120 Grand Prize 4
50 Golden Terra 14
550 Glynn Dale 50c
470 H & Norcross 17⅞@18
1100 Hussey 20c
250 Hamburg 50c
100 Hillside 1⅞
1600 Independence 2½
915 Julia 4¼@4.15
635 Justice 4¼@4.10
1650 Jupiter 2.60@2⅜
600 Leviathan 75c
100 L Wash 1.80
430 L Bryan 1.10@1.15
100 Leopard 1.05
265 Mexican 27⅜@27
250 Mackey 1½
100 Maryland 50c
400 McClinton 1½@1.45
100 Manhattan 2¼
595 Mono 11½@11¼
255 M White 6½@7
70 Mammoth 12⅞@12½
1250 May Belle 55@70c
100 Mt Diablo 2½
200 New York 75@80c
100 New Coso 20c
80 N Con Virginia 9
305 N Bonanza 1⅛@1.60
125 Navajo 30@25c
20 Northern Belle 5⅞
205 Noonday 3⅞@4
350 N Noonday 1⅞
130 Ophir 31½@31⅞
160 Overman 10½@10⅞
15 Occidental 80c
200 Oriental 25c
1500 Orient 50c
400 Paradise 1.70@1.60
1090 Potosi 6@5⅞
1025 Phil Sheridan 75c
820 Queen Bee 90c
230 Ray'd & Ely 4
100 Real del Monte 1½
400 Red Cloud 75c
180 Richer 1
850 S Standard 25c
285 Summit 2.30@2½
820 Savage 16@17
70 Sierra Nevada 46½@46¼
1085 Silver Hill 1.90@1.85
100 Scorpion 2¼@2.40
200 Solid Silver 40@45c
375 South Bodie 40@45c
100 Standard 30½
360 S Bulwer 1.40@1.30
575 Syndicate 6@6¼
70 Silver King 7
50 Tiptop 1.10
300 Tuscarora 10c
1770 Tioga 7⅜@7⅛
360 Union Con 44@45
135 Utah 21½@21¼
1170 University 65@60c
400 Vortex 75c
175 Woodville 25c
1320 Ward 1½@1.60
430 Yellow Jacket 17⅜@17¼

Monday A. M., June 30.
570 Andes 95c@1
1450 Alta 10@9
20 Alpha 25
550 Atlantic 35@30c
1330 Benton 7@6⅞
805 Belcher 6½@6
60 Best & Belcher 18⅜@18⅞
830 Bullion 7⅞@8
160 Confidence 16⅞
215 Con Imperial 1.80@1.85
680 Crown Point 4.70@4.65
1800 C Dorado 1⅞@1.70
340 California 5⅜@5½
370 Con Virginia 5⅜@5½
190 Chollar 8⅜@8⅞
190 Caledonia 2.60
150 Challenge 2.90@2.95
520 Exchequer 7⅞
300 Fairfax 1
300 Flowery 70c
190 Gould & Curry 12⅞@12½
135 Hale & Nor 17⅞@17½
415 Justice 4@4.70
660 Julia 4½@4.35
210 Kentuck 5@4.90
30 Lady Bryan 1.20
200 Leviathan 75@70c
465 Lady Wash 2.30@2.45
615 Mackey 1.30@1¼
100 Mountain View 2.40
615 Mexican 27¼@27½
100 North Con Vir 9¼
650 New York 75@80c
475 N Bonanza 1½@1.60
240 Ophir 31½@31
330 Overman 10⅞@11⅜
465 Potosi 6
395 Sierra Nevada 46½@46⅞
330 Silver Hill 2.20@2.10
50 S Utah 20c
300 Succor 15c
310 Savage 16⅝@17
700 S Potosi 80c
200 Solid Silver 40c
450 Trojan 25c
80 Utah 20½
470 Union Con 44@43½
260 Ward 1.60@1.65
20 Yellow Jacket 17¼@17⅜

AFTERNOON SESSION.
400 Adenda 65@70c
100 Albion 30c
270 Argenta 1.05@1
100 Aurora T 75@60c
150 Bodie 22½
1430 Bechtel 2¼@2.30
2250 Belle Isle 1.60@1.55
100 Belmont 35c
100 Bulwer 9
510 Black Hawk 2.10@2
980 Booker 1.30@1¼
140 Belvidere 1.80@1⅞
950 Champion 65@60c
1600 Crœsus 25@30c
550 Caledonia (B H) 3
250 C Pacific 7½
400 Chieftain 10c
70 Day 25c
200 D Standard 1½@1.20
200 DeFrees 25c
340 Defiance 1⅛@1⅞
1740 Dudley 2¼@2½
50 Eureka Con 17
100 Endowment 30c
730 Gila 1@1.10
260 Golden Terra 14
300 Glynn Dale 70@65c
300 Hussey 20c
150 Hillside 1⅞
310 Highbridge 15c
200 Hamburg 60c
1160 Independence 2½
10 Jackson 5
535 Jupiter 2¼@2½
770 Leopard 1.10@1
5 Manhattan 2½
830 May Belle 50@70c
405 McClinton 1½
30 M White 5¼
1215 Mammoth 12
560 Mono 11½@11¼
5 Northern Belle 5⅞
50 New Coso 20c
1950 N Noonday 2@2½
695 Noonday 4@4.40
2450 Orient 45@50c
900 Oriental 35@40c
150 Paradise 1.70@1.60
105 Phenix 2.90@3
790 Queen Bee 90@80c
1225 Richer 1½
160 Raymond & Ely 4
595 Red Cloud 65@75c
1090 S Bulwer 1.40@1¼
570 Summit 2½
100 Syndicate 7½
590 S Bodie 35@40c
520 South Standard 25c
300 Star 25c
1180 Tioga Con 7¼@7⅞
245 Tuscarora 10@15c
60 Tiptop 1.10
2800 University 65@50c
150 Vortex 75c

Tuesday A. M., July 1.
925 Alta 9¼@9⅜
50 Alpha 24
2270 Andes 1@1.15
550 Belcher 6⅜@6½
60 Best & Belcher 18@18½
530 Benton 6¼@6½
630 Bullion 7⅞@7⅜
135 California 5⅜
165 Con Virginia 5⅜@5½
230 Chollar 8½
1360 Con Imperial 1⅞@1.80
815 Crown Point 4½@4⅜
70 Confidence 13½@13⅞
60 Caledonia 2½
800 Con Dorado 1.80@1.90
600 Exchequer 7⅝@7⅞
300 Flowery 50c
95 Gould & Curry 12¼@12
195 H & Norcross 16½
1000 Julia 4½@4.40
310 Justice 4.60@4½
30 Kentuck 4⅞
220 L Bryan 1.15@1.10
950 Lady Wash 2.15@2.10
300 Leviathan 75c
610 Mexican 27@26⅞
300 Mackey 1.30
100 Mt View 2.40
965 New York 75@85c
200 N Bonanza 1.60
125 North Con Vir 9¼@9
565 Ophir 30¼@30½
165 Overman 11@10½
25 Occidental 95c
125 Potosi 5½
100 Phil Sheridan 60c
315 Savage 16@15⅞
440 Sierra Nevada 45½@43
400 Scorpion 2¼
150 Succor 15c
150 Silver Hill 2.10
2000 S Utah 10c
165 Trojan 25c
35 Utah 20@20½
905 Union Con 43½@42
430 Ward 1.60@1.55
100 Woodville 30c
320 Yellow Jacket 17⅜@17⅞

AFTERNOON SESSION.
100 Albion 30c
60 Argenta 1
600 Aurora T 60c
1945 Addenda 70@65c
200 Belmont 40c
230 Bulwer 9@9½
255 Bodie 22½@22
2860 Booker 1@1.10
1130 Bechtel 2.20@2.30
1330 Belle Isle 1.60@1.55
290 Belvidere 1.80
1100 Black Hawk 1⅞
950 Caledonia (B H) 3
1250 Crœsus 30c
810 C Pacific 7⅜@7⅞
1500 Champion 65@60c
600 Day 35@30c
1670 Dudley 2.30@2½
100 DeFrees 25c
350 Defiance 1.80@2
100 D Standard 70c
100 Endowment 35c
40 Eureka Con 17
700 Fourth of July 75@85c
55 Grand Prize 3½
500 Golden Terra 14
200 Glynn Dale 60@70c
1950 Gila 95c@1
200 Hamburg 50c
720 Independence 2½@2.45
900 Jupiter 2¼@2.30
510 Leopard 1.10
320 McClintou 1½@1.60
650 May Belle 60@70c
1095 Manhattan 3@2.95
420 Martin White 6@6½
200 Mt Diablo 2½
660 Mammoth 10@9½
245 Mono 11¼@11
450 Navajo 40c
750 Noonday 4⅞@4.80
2070 N Noonday 2½@2.60
1490 Orient 50c
650 Oriental 35@30c
500 Phenix 2.90@3
900 Queen Bee 60@50c
1185 Richer 1½
25 Raymond & Ely 4
300 Red Cloud 85c
760 Summit 2¼@2.40
350 S Bodie 40c
395 Syndicate 6½@6⅞
300 Star 35@30c
130 Silver King 7@6
1210 S Bulwer 1.35@1¼
600 S Standard 20@25c
100 Tuscarora 15c
1140 Tioga 7½@7⅞
600 University 60c
500 Vortex 75c
100 W Pacific 50c

SALES OF LAST WEEK AND THIS COMPARED

Thursday A. M., June 26.
345 Alpha 25½@26
265 Alta 6⅞
280 Best & Belcher 18⅜@18⅞
460 Bullion 7⅜@7⅞
940 Belcher 6½@6⅛
370 Benton 5@4.90
180 California 5⅜@5½
800 Crown Point 5@4⅞
490 Con Imperial 1.80@1.85
190 Chollar 7⅞
80 Con Virginia 5⅜@5½
270 Caledonia 2⅜@2.60
50 Challenge 2.90
300 C Dorado 1.70
435 Exchequer 7⅞@7½
650 Fairfax 1½
600 Flowery 65@60c
635 Gould & Curry 12¼@12
425 Hale & Nor 16½@16
285 Julia 4@3.90
440 Justice 4.20@4.10
250 Kossuth 20c
255 Lady Wash 1⅞@1.80
560 Leviathan 75@70c
960 L Bryan 1¼@1.30
450 Mackey 1.40@1.30
1790 Mexican 27½@26⅞
150 Mt View 2.30@2.40
90 New York 75@80c
490 N Bonanza 1.40@1.60
15 N Con Vir 8⅝@8⅞
225 Ophir 31½@31⅞
125 Overman 10½@10
100 Phil Sheridan 65@75c
320 Potosi 5¼@5½
910 Savage 15¼@15½
335 Sierra Nevada 45@45¼
600 Succor 10@15c
250 S Potosi 75c
170 Scorpion 2½@2.60
220 Solid Silver 45c
85 Silver Hill 1.80
50 S Utah 25c
1775 Trojan 25@30c
40 Utah 21⅞@22½
910 Union Con 43@45
300 Woodville 30c
300 Ward 1.55
350 Yellow Jacket 17¼@17

AFTERNOON SESSION.
400 Albion 40@35c
800 Argenta 1.10@1.15
650 Aurora T 65@75c
1275 Addenda 95c@1
295 Bodie 22@22½
250 Bechtel 1⅞@1.80
1475 Belle Isle 1⅛@1.20
40 Bulwer 10
1180 Booker 1¼@1.30
60 Black Hawk 2¼@2.20
100 Belvidere 1.85
200 Chieftain 50c
85 C Pacific 7¼@7½
1500 Crœsus 10c
950 Champion 50c
200 Caledonia (B H) 4
150 Day 35@30c
100 DeFrees 5c
975 Dudley 1.90@2
650 Defiance 1½
725 D Standard 1.20@1.10
100 Eureka Con 16½
100 Fourth July 75c
405 Grand Prize 4.10@4
150 Gila 1.15@1.10
615 Goodshaw 60@65c
300 Glynn Dale 70c
900 Hussey 10@5c
250 Hamburg 60@[illegible]
835 Independence 2.60@2.40
2170 Jupiter 2¼@4¼
200 Jackson 5
120 Leopard 1. 5
300 Leeds 90c@1
535 May Belle 50c
280 Mono 11¼@11½
65 M White 7
50 Mammoth 13
70 Mt Diablo 2⅞@3
200 McClinton 1.40@1.35
300 Navajo 35c
50 Northern Belle 6
600 N Noonday 2.10@2
2690 Oriental 50@55c
600 Paradise 1⅞@1.90
1930 Queen Bee 80c@1
550 Richer 85c
260 Red Cloud 75c
100 Raymond & Ely 4
60 Silver King 7@7½
550 Summit 2½@2.60
240 Syndicate 6
1100 S Bulwer 1.30@1.35
490 S Bodie 35@40c
800 S Standard 25@20c
600 Tuscarora 10@20c
365 Tiptop 1.15@1¼
1905 Tioga Con 6⅞@6¼
700 University 70@65c
750 Vortex 75@85c
50 W Pacific 50c

Wed'sday A. M., July 2.
1450 Andes 1½@1.40
1540 Alta 10⅞@10
155 Alpha 28@27
350 Belcher 6¼@6⅞
240 B & Belcher 18⅞@19
1055 Bullion 7⅞@7⅞
1520 Benton 7¼@7⅞
825 California 5⅜
400 Crown Point 4.70@4.65
680 Chollar 8@7⅞
450 Con Virginia 5⅜@5½
2050 Con Imperial 1⅞
100 Challenge 2.80
420 Caledonia 2½
50 Confidence 13⅞
1900 Con Dorado 1.90@2.10
140 Exchequer 7½@7⅞
500 Flowery 60@55c
410 Gould & Curry 12½@12⅞
130 Hale & Nor 17@17⅞
460 Justice 4.70@4.90
125 Julia 4.45@5.40
10 Kentuck 4.60
100 Leviathan 75c
575 Lady Bryan 1.10@1
985 Lady Wash 2.80@2.60
125 Mexican 27½@27¼
150 Mt View 2.40@2.30
300 Mackey 1½
405 N Bonanza 1⅞
500 New York 90@85c
125 North Con Vir 9
50 Occidental 1
30 Overman 11
290 Ophir 30⅞@31
500 Potosi 5½
380 Savage 15¼@15⅝
540 Sierra Nevada 44¼@44
190 Silver Hill 2.20@2.10
575 Succor 10@15c
150 Solid Silver 40c
120 Scorpion 2¼@2
600 S Utah 15c
300 S Potosi 85c
300 Trojan 25c
80 Utah 20@20½
625 Union 40½@41
730 Ward 1½@1.55
215 Yellow Jacket 17⅞@17½

AFTERNOON SESSION.
500 Albion 30c
200 Aurora T 60c
430 Argenta 1
160 Bodie 23½@23¾
1715 Bechtel 2.15@2.30
150 Belvidere 1⅞
1100 Booker 1.10@1
50 Bulwer 9½
2600 Belle Isle 1.60
500 Champion 65@55c
300 Crœsus 30@35c
250 Con Pacific 7⅞
325 Defiance 1.90
285 Dudley 2.30
15 Eureka Con 16½
1100 Gila 90c@1
1030 Grand Prize 4
200 Hamburg 55c
100 Hillside 1⅞
70 Independence 2½
250 Jupiter 2¼
50 Mammoth 10½
420 M White 6
190 Mono 11½
450 May Belle 60@65c
100 McClinton 1.60
20 Manhattan 2½
220 Modoc 1
150 New Coso 15c
100 Navajo 30c
275 Northern Belle 5
300 N Noonday 2½
300 Noonday 4.85@4⅞
2000 Orient 75@65c
100 Paradise 1.60
1175 Queen Bee 60@65c
50 Richer 1.40
150 Red Cloud 95@90c
120 Raymond & Ely 4½
425 Summit 2.30@2⅜
100 Syndicate 8
150 Star 40c
200 South Standard 25c
800 S Bodie 35@40c
50 Silver King 7½
300 S Bulwer 1.10@1¼
1955 Tioga Con 7@6⅞
250 Tiptop 1
850 W Pacific 50c

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alta S M Co	Nevada	15	1 00	June 12	July 17	Aug 4	W H Watson	302 Montgomery st
Belcher S M Co	Nevada	18	1 00	May 20	June 25	July 15	Jno Crockett	203 Bush st
Booker Con G M Co	California	3	50	June 30	Aug 4	Aug 25	W H Lent	309 Montgomery st
Brilliant M Co	Nevada	3	10	May 19	June 23	July 14	H S Stone	419 California st
Commonwealth Con M Co	Nevada	1	25	June 27	July 31	Aug 20	C A Morse	217 Sansome st
Crown Point G & S M Co	Nevada	37	1 00	June 4	July 11	July 29	Jas Newlands	203 Bush st
DeFrees M & M Co	Nevada	10	15	May 29	June 28	July 18	T E Atkinson	318 Pine st
Hussey Con G & S M Co	Nevada	8	15	May 27	July 1	July 22	Jno E Dixon	327 Pine st
Justice M Co	Nevada	28	1 00	May 26	June 30	July 19	R E Kelley	419 California st
Leopard M Co	Nevada	11	50	June 11	July 15	Aug 5	J E Dixon	20 S F Stock Ex
Mexican G & S M Co	Nevada	6	1 00	May 14	June 18	July 10	C L McCoy	203 Bush st
N Comstock S M Co	Nevada	1	05	May 30	July 2	July 23	D L Thomas	203 Bush st
N Noonday M Co	California	2	25	June 5	July 14	Aug 18	G A Holden	310 Pine st
Real Del Monte M Co	Nevada	7	1 00	June 10	July 19	Aug 11	C V D Hubbard	203 Bush st
Sierra Nevada S M Co	Nevada	58	3 00	June 12	July 16	Aug 5	W W Stetson	309 Montgomery st
Solid Silver G & S M Co	Nevada	1	25	May 14	June 16	July 10	J J Applegate	331 Montgomery st
Summit G M Co	California	2	50	June 5	July 10	July 31	W H Lent	309 Montgomery st
Union Con S M Co	Nevada	13	2 00	June 4	July 7	July 24	J M Buffington	309 California st
University G M Co	California	2	10	June 9	July 14	Aug 4	W Letts Oliver	328 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Ajax G & S M Co	California	2	10	June 11	July 14	Aug 1	A F Main	309 California st
Allison Ranch Ford G M Co	Cal	—	01	June 16	July 18	Aug 4	J E Carr	Grass Valley
Armaud G & S M Co	California	1	10	June 9	July 28	Aug 25	J L Fields	240 Montgomery st
Armstrong G M Co	California	1	05	June 11	July 14	Aug 1	J W Pew	310 Pine st
Butte Creek H M Co	California	2	25	Apr 16	June 6	July 7	R L Taylor	310 Pine st
Champion M Co	California	3	15	Apr 15	June 6	July 7	Jno Crockett	203 Bush st
Crœsus G & S M Co	California	1	05	June 16	July 21	Aug 14	E Hestres	328 Montgomery st
Dudley M Co	California	4	25	June 12	July 16	Aug 11	E O Masten	22 Nevada Block
Emigrant S M Co	California	4	50	May 10	July 3	July 23	B W Mudge	309 Montgomery st
Fall Creek M Co	California	3	40	June 11	July 22	Aug 14	C Robinson	310 Pine st
Gover M & M Co	California	38	50	May 21	July 1	Aug 11	W O Wilson	402 Front st
Hartford S M Co	California	1	50	June 18	July 21	Aug 13	S Heringhi	422 Montgomery st
Leo M Co	Nevada	5	50	June 14	July 19	Aug 8	J J Scoville	59 Nevada Block
Mayflower Grav M Co	California	5	10	June 17	July 22	Aug 8	J Morizio	328 Montgomery st
McClinton M Co	California	3	25	May 15	June 20	July 10	Wm H Lent	309 Montgomery st
Mono G M Co	California	4	50	June 21	July 28	Aug 18	W H Lent	309 Montgomery st
Numa M Co	Nevada	1	03	June 13	July 24	Aug 11	D Wilder	328 Montgomery st
Occidental Con Grav M Co	California	1	07	May 19	June 23	July 12	W T Smith	402 Montgomery st
Oriental Con G & S M Co	California	3	25	June 25	July 25	Aug 11	H C Hinman	411 California st
Oroville Grav M Co	California	2	10	May 31	June 30	July 18	J T McGeoghegan	318 Pine st
Old Dan G & S M Co	California	1	35	May 16	June 20	July 10	Wm H Watson	302 Montgomery st
Oro M Co	California	1	05	——	May 8	——	William Stuart	320 Sansome st
Planet Grav M Co	California	—	02	May 19	June 21	July 15	M Byrne, Jr	Grass Valley
Rocky Bar G M Co	California	1	10	May 26	June 28	July 15	G W Hill	Grass Valley
Rustler G M Co	California	1	10	June 30	Aug 4	Aug 25	A F Main	309 California st
Seg Europa M Co	Nevada	1	25	Apr 4	July 15	Aug 2	R B Noyes	240 Montgomery st
San Pedro G & S M Co	California	1	02	May 14	June 16	July 7	T A White	113 Leidesdorff st
Sigourney G & S M Co	California	2	05	May 15	June 21	July 11	A Judson	320 Sansome st
Silver State M Co	Nevada	10	06	May 20	June 24	July 22	A Halsey	314 Montgomery st
Swansea M Co	California	1	10	June 14	July 21	Aug 11	F N Delaney	315 California st
Tellurium G & S M Co	California	18	10	May 29	July 5	July 31	J M Litchfield	415 Montgomery st
Union G & S M Co	California	20	05	June 9	July 10	July 26	R Vincent	Grass Valley

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Belmont M Co	Nevada	J W Pew	310 Pine st	Annual	July 11
Best & Belcher M Co	Nevada	W Willis	309 Montgomery st	Annual	July 14
Bohemia M Co	——	J Klein	121 Sansome st	Annual	July 21
Curtis Con M Co	——	W A M Van Bokkelen	419 California st	Special	July 8
Eagle S M & M Co	Nevada	J E Dixon	20 S F Stock Ex	Annual	July 7
Modoc Con M Co	California	J W Pew	310 Pine st	Annual	July 8
Overman S M Co	Nevada	G D Edwards	414 California st	Annual	July 10
Savage M Co	Nevada	E B Holmes	309 Montgomery st	Annual	July 17
Sherwood Con M Co	——	W A M VanBokkelen	419 California st	Special	July 8
Union Con S M Co	Nevada	J M Buffington	309 California st	Annual	July 21
Utah S M Co	Nevada	G C Pratt	309 Montgomery st	Annual	July 8
Yellow Jacket S M Co	Nevada	M Otey	Gold Hill, Nev	Annual	July 21

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
California M Co	Nevada	C P Gordon	23 Nevada Block	50	June 17
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	50	June 16
Excelsior W & M Co	California	G P Thurston	315 California st	25	Apr 21
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	1 00	May 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	Apr 30
Standard Con M Co	California	W Willis	309 Montgomery st	50	Apr 12
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	30	May 27

Pacific Board—Latest Sales.

Tuesday A. M., July 1.
100 Alta 8⅞@9
365 Andes 1@1.10
170 Benton 6⅞@6½
70 Best & Belcher 18⅞@18
190 Belcher 6¼
20 Booker 1½
30 Black Hawk 1.85
140 Bullion 7⅞@7.80
50 California 5⅝
500 Cameron 3.10
100 Champion 60c
150 Chollar 8½@8⅜
20 Crown Point 4⅜@4¼
100 Exchequer 7.80
180 Gould & Curry 12⅞@12¼
20 Hale & Nor 17
20 Julia 4.40
20 Justice 4½
20 Kentuck 4⅞
100 Mexican 26⅞@26¼
10 N Con Virginia 9
90 Ophir 30⅞@29⅞
60 Potosi 5½
80 Sierra Nevada 44@43⅞
60 Savage 16⅜@15½
10 Yellow Jacket 17⅜

AFTERNOON SESSION.
10 Alta 9
255 Andes 1.15@1.20
50 Benton 6¼
25 Best & Belcher 19
10 Con Virginia 5.40
40 Gould & Curry 12½@12¼
10 Justice 4½
50 Julia 4.40@4.45
100 N Standard 2
50 Phil Sheridan 65c
260 Silver Hill 2.10@2
110 Savage 15¼@15½
100 Trojan 24c
300 Tiger (B) 75c
10 Utah 20
500 Walker 70@65c

California Board—Latest Sales.

Tuesday A. M., July 1.
30 Alta 9
950 Ætna (A) 4@6c
50 Andes 97½c
30 Belcher 6¼@6½
75 Best & Belcher 18½@18⅝
50 Bullion 7⅞@7⅞
50 Black Hawk 2
100 Brilliant 50c
100 Con Washoe 37½c
40 California 5⅝@5.45
50 Con Virginia 5½@5⅜
300 Con Imperial 1.80@1.85
60 Crown Point 4⅜@4⅜
30 Chollar 8¼
45 Challenge 2.90@2.95
150 Crœsus 30c
45 Caledonia 2½
600 Central 50@52½c
40 Exchequer 7⅞
60 Gould & Curry 12⅞@12½
40 Hale & Nor 17⅜@17¼
50 Julia 4.40@4.45
150 Justice 4.40@4.45
50 Kossuth 20c
30 Mexican 27¼
500 Newark 20c
50 New York 85c
100 Orient 47½c
30 Ophir 31@31½
30 Potosi 5⅞
70 Savage 16⅞@16½
40 Sierra Nevada 46½@46⅜
50 Silver Jacket 40c
20 Union Con 44¼
300 Wm Penn 30c

AFTERNOON SESSION.
10 Alpha 24
30 Alta 9
100 Ætna (N) 1½
50 Andes 1.15
200 Almaden Q 1⅝
30 Belcher 6⅛
20 Best & Belcher 18½@18⅝
30 Bullion 7⅝
50 Benton 6⅛
20 California 5⅜
30 Con Virginia 5½@5⅜
200 Con Imperial 1⅞
40 Crown Point 4½
30 Chollar 8⅜
30 Challenge 2.90
40 Caledonia 2½
1200 Coso Con 10@7c
500 Central 75c
300 Enterprise 1⅜

50 Exchequer	7½@7¾	30 Ophir	30¾
150 Goodshaw	f.55	50 Queen Bee	75c
100 Golden Chariot	7c	30 Savage	15½@15¾
40 Gould & Curry	12½@12¾	110 Silver Hill	2
100 Gwyn Dale	75c	150 S Utah	10c
30 Julia	4.45	120 Trojan	25c
30 Justice	4¼	50 Tiger [W]	1½
200 Kossuth	20c	225 Tiger [B]	75c
50 Mexican	26½@26¾	30 Union Con.	40½
500 Newark	20c	20 Yellow Jacket	17½

The Mining Share Market.

The mining share market during the past week has not been of a kind calculated to gladden the heart of the average operator, nor yet inspire the masses with hopes of an early improvement. Comstock shares, the old king pins, have been soggy, resolutely slipping down in spite of determined efforts to maintain previous quotations. That stocks should be neglected on the approach of our great national holiday is natural enough, the dealers patriotic instincts getting the better of selfish considerations.

Glancing over the field our mining industries seem fairly prosperous, notwithstanding statistics show the yearly supply of the precious metals to be $160,000,000 less than the business of the world demands. This is a deficiency which our mines could fill. The bullion yield, although short in Nevada to the extent of 20% this year, as compared with last, need not be regarded as a giving out of the mines. Reports from all quarters show an unusual activity in mining, and an increase in the quantity of metal turned out. The glowing accounts of recent strikes in Mono county, Cal., in Arizona, Idaho, and Colorado, though probably exaggerated, are no doubt in the main truthful, pointing to an early increase of our aggregate bullion production. The late falling off in the product of this coast has been due mainly to the diminished out-put from the Bonanza mines on the Comstock lode, which latter has greatly disappointed public expectation, both as regards the yield from these as well as other mines in that vicinity. The Comstock group of mines made but a sorry bullion exhibit last year, a showing which the present year will hardly improve, even though the ore developments now deemed imminent should prove realities. A glance at the history of these mines is not calculated to encourage investments in their shares just now, much as is said about ore bodies known to exist in the lower levels of some of them. Only a little more than one year ago, what was then proclaimed as a veritable bonanza was struck in the Sierra Nevada ground. The stock of that company, then worth $2.90 per share, at once jumped to $270, raising the value of the mine from less than $300,000 to $27,000,000. But there was no bonanza there, or none, at least, that has yet yielded any bullion to speak of, nor is it known when, if ever, it will make any large production. The price of these Sierra Nevada shares afterwards fell to $37 per share, being at the rate of $3,700,000 for the entire property. In less than six months over $23,000,000 disappeared, nor is it difficult to say who were the chief sufferers by this annihilation of values. This, though an extreme case well illustrates, in a general way, the record of these Comstock mines through a long series of years, the assessments on the shares of these mines, as a whole, having amounted to more than 50% of the dividends declared, to say nothing of purchase money paid for these properties in the first instance. Leaving out dividends paid by two mines, the Con. Virginia and the California, the assessments collected from Comstock shareholders exceeds the dividends disbursed to them by more than $15,000,000. Notwithstanding the improved prospects of these mines through the completion of the Sutro tunnel, it will be time enough to discount the advantages thence accruing when they come to be realized. Meantime let the magnates, who manage the Comstocks and have confidence in their future, go on and prove their faith by their works, while the public possessing themselves in patience wait and see what shall come of it.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Northern Belle, June 23d, $2,491.71; Indian Queen, June 23d, $4,117.07, Northern Belle, June 25th, $2,550.81; Ophir, June 26th, $16,656.03; Belle Isle, June 30th, $28,000; Independence, June 30th, $15,000; California, June 28th, $46,074.66; Martin White, June 25th, $5,895.39.

PLATINUM.—We have been shown a letter from T. A. Edison making inquiries about platinum deposits on this coast. The letter coming from Mr. Edison is of course written with an electric pen. Platinum has been found in small quantities in our mines, perhaps more in Butte county than elsewhere. Under the impression that it was more valuable than gold, the miners looked for it or tried to save it, but it not being a paying metal its search was abandoned. Intimately united with gold its separation is a matter of extreme difficulty. Our rocks are seldom favorable for such a metal. It is found generally in the alluvial gold of mountain streams. The unexplored mineral regions may develop platinum finds, particularly the unexplored eastern interior of British Columbia, and the west source of Frazer river, in quantities sufficient for profitable extraction.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

MARTINEZ.—*Ledger*, June 28: The new hoisting works are expected to be in running order in a few days. The boiler is 54 inches in diameter by 16 ft in length, and the machinery is estimated at nearly 100-horse power. All of it has been brought from New York. A compressor drill will also be purchased to facilitate operations in connection with this mine. The new shaft is down 50 ft.

DOWN'S.—Another clean-up was completed at this Volcano mine, on Monday of last week, embracing a run of 24 days. The yield of bullion was $8,300, the average surrender being $67 per ton. This is the largest amount of gold yet obtained from any clean-up of this claim, although the average yield falls somewhat below that of one or two previous runs, where a smaller quantity of ore was put through the mill. The mine is looking well in every way. Sinking operations will be commenced in a few weeks.

MISCELLANEOUS.—The Moyle gravel claim, in Volcano basin, is running along smoothly, under the co-operative plan. Moyle furnishes water and two men, and the workmen furnish the balance of the labor, with the understanding that the proceeds are to be equally divided between the owners and employers. We are unable to say how the claim is paying under this agreement. They have cleaned up twice since this arrangement was entered into, and from the fact that operations continue to be pushed steadily, we presume the result was satisfactory to all parties. The Santa Clara company, near Volcano, are putting up three roasting furnaces and a mill, for custom rock. A 15-horse power engine is on the ground. We believe the process which they intend to follow in the treatment of ore is a new one, at least in this county. In the Confidence mine, a short distance from Volcano, a fine body of ore has lately been uncovered.

INYO.

MODOC.—*Independent*, June 21: Results of work on 1000 level for the week ending yesterday morning, are as follows: Main tunnel run 34 ft; drift from 300-foot point, 15 ft; drift from 1100-foot point, 15 ft. Total length of tunnel, 1,736 ft. Drift, 300-foot point, 100 ft. Drift, 1100-foot point, 33 ft. Face of tunnel has just passed through a clay seam, and is now in easy breaking ground. Drift at 1100-foot point presents about the same appearance as it has for the entire length. Following the hanging wall; ledge matter in top, bottom and west side of drift. In drift at the 300-foot point, broke into a small cave, lined with crystallized lime and manganese. Ground at this point looks very fine.

MARIPOSA.

COULTERVILLE ITEMS.—*Gazette*, June 28: J. Handy, of San Francisco, has sold the Bondurant and Martin & Walling mines to Eastern parties for $80,000, cash. The 10-stamp mill at the former mine is running day and night on $30-ore. James Dolan & Co. are driving a main tunnel on the vein in the Italian mine, and have a large vein of $15-ore. Mt. Morris mine, owned by Majs. Wilburn and Johnson, is developing a vein two ft in width, that prospects in free gold at the rate of $20 per ton. Hilliard & Hartford, at Bull Creek, have struck a large vein of fine ore on Burnell's gulch. A few tons worked in the Bull Creek mill, paid them at the rate of $15.87 per ton. The vein is fully five or six ft in width. In the Gen. Ord mine, the tunnel is in about 100 ft, with a vein 20 inches to two ft in width with ore worth $25 to $30 per ton. In the Eureka mine, the vein is fully six ft in width, and pays $40 to $50 per ton. On Texas hill a vein was lately struck, out of which nine tons were taken which milled $50 per ton.

MONO.

ITEMS.—Bodie *News*, June 25: The mining product of Bodie district is constantly on the increase. Standard has enough ore in sight to guarantee two years more of dividends, and the mine is kept in advance of the mill. Bodie is opening out so immensely rich that one ton of its ore, it is said, equals a dozen of any found elsewhere. The new strike in Lake district, in the Mammoth mine, is said to be enormously rich, and the indications are that this lead may extend for many miles. Traces are said to have been discovered far to the south and southeast. The new strike was made in the Mammoth 73 ft below the bottom of the middle tunnel. The assay reaches up into the thousands—both silver and gold. A rich strike has been made in the Orient, of a 10-foot ledge at 125 ft.

BULLION.—The bullion shipments from Bodie district, through Wells, Fargo & Co., from June 1st to 24th, inclusive, are as follows: Standard, $138,903.23; Bodie, $70,747.18; Bulwer, 17,253.30; Noonday, $9,121.27. Total, from June 1st to 24th, $236,024.98. During the month of May the entire shipments of the month were but $101,228.83. We have now a full week to run before the close of June, and the figures by that time will approximate $300,000.

BODIE MILL.—The result of a two days' run in the batteries of the Bodie mill was shown yesterday, in a collection of gold nuggets worth $16,000. The nuggets were mixed up with the coarse brownish sand usually found with the metal. The stamps are crushing about 22 tons per day. The clean-up of an 11 days' run realized $75,000. The bullion is worth about $13.75 per ounce, with about 30% silver.

PRESCOTT DISTRICT.—The new Prescott district lies south of Bodie 25 miles, and is 17 miles long, north and south, by 10 miles wide, east and west. The mineral belt is a strict continuation of the Bodie deposition. A large stream of water traverses the entire length of the district, and cuts nearly all of the principal ledges obliquely—in two instances to the depth of about 1,000 ft. The entire eastern slope is mineral bearing. The ore bodies are so large and well defined that but little of the usual sinking has been done. The assays that have been made upon random ores, have run from $35 to $125 per ton, averaging 60% gold and 40% silver. One of the ledges shows a width of nearly 100 ft, mostly free milling ore.

ITEMS.—*Chronicle*, June 28: The north drift on the big ledge of the Standard Con. is in 260 ft; the fissure at this point is so large that timbering, on the Comstock plan, has to be resorted to. The ledge is 20 ft wide of clean ore; 700 level is flooded. The West Standard is in 12 ft of ore—half of it $300-grade. The new bonanza, Bodie, is working to its utmost. The ore in all of the levels is rich. On 300 level, the winze is down 43 ft in two-ft ore. In Tioga the winze on the 320 ledge, west, is down 37 ft. Ore is five ft wide. The Con. Pacific is in ore five ft wide on the 100 level. Steam hoisting works are being erected on the surface. In Bulwer the drift in the east branch of the Ralston ledge is in ore two and a half ft wide.

NOONDAY AND NORTH NOONDAY.—Bodie *Standard*, June 30: The south drift on the Noonday ledge, 200 level, is in 270 ft, the ledge in the face being two and one-half ft wide. The winze is down 116 ft, the ledge being strong in the bottom. Drifts will be run north and south from this point. The stopes are looking well. The new joint shaft on the line between the Noonday and North Noonday is now 104 ft in depth, a progress of 14 ft during the week. At a depth of 200 ft it will be connected with the old Noonday workings.

STANDARD CON.—The north drift from the east crosscut, 385 level, has been extended 10 ft; total length, 253 ft. The ledge is from 12 to 15 ft wide, of very fine ore. The upraise has reached a point 183 ft above the level. The ledge here is also about 15 ft wide, of good ore. The west crosscut from the south drift, 450 level, incline shaft, is in 53 ft; progress during the week, 10 ft. The face is in good blasting rock. South drift, on Oildea ledge, has been advanced since last report nine ft; total length, 97 ft. The ledge is two and one-half ft wide, of good milling ore. The west crosscut from the south drift, 550 level, is in 181 ft; progress for the week, 25 ft. It is expected soon to cut the ledge in the north drift, 385 level, of main shaft. In the stopes on the Oildea, the ledge is three and one-half ft wide, of very rich ore. The ledge in the stopes, south drift, 300 level, is four ft wide, and looks well. In the stopes, south drift, 550 level, the ledge is eight ft wide, of very fine ore. The ledge in the stopes, north drift, 385 level, is from 10 to 15 ft wide, of good ore, and the mine throughout is looking well.

SYNDICATE.—The south main tunnel is following a small vein. The tunnel has now reached a point within 50 ft of the dividing line, between the Syndicate and the Tioga, where a crosscut will be run the entire width of the company's ground. An upraise is being made from this vein to connect with the drift on the old Tioga ledge in the old tunnel, and is now 35 ft above the drift. The vein holds its own in width and prospects well in gold. The upraise to connect with the old winze is nearly through. The winze is being made a double compartment, one for an ore chute and the other for a tramway. The chute will be 510 ft in length. A track is being laid through the old Osceola tunnel about 500 ft, from which point crosscuts will be run to connect with the Isabella on the west and the New Mexico on the east. The mill is running steady on Standard ore, and will be until the completion of the contract, when it will be started on Syndicate ore.

BODIE CON.—The crosscut east from the old shaft is in 358 ft. The drift south, on first level, 68 ft. The drift south, second level, on ore 72 ft. The winze, second level, 41 ft. The east crosscut, third level, 223 ft. The west crosscut, same level, 118 ft. Drift north, No. 1, 275 ft; No. 2, 156 ft. Drift south, 115 ft. Second crosscut, east from south drift, 28 ft. South winze, 29 ft. The vein in the south winze, on the third level, shows improvement in width and quality of ore, and the drift south, on second level, is improving, both in the size of the vein and its quality. In the bottom of the north winze the vein continues very rich both in gold and silver, and is becoming gradually larger. The mill is running steadily and doing very good work, and to-morrow two more bars will be ready for shipment.

NEVADA.

ITEMS.—*Foothill Tidings*, June 28: The Nevada City mine has struck an apparently good lead of quartz at the bottom of the incline, which is now down something like 140 ft. Supt. Perkins came down from the North Bloomfield mine with a fine lot of bullion, which was shipped to the Bay through Wells, Fargo & Co.'s express. The Poor Bros., whose claim is above Blue Tent, have recently struck into some very rich gravel and are drifting. They have engaged water from the South Yuba Canal Co. to make a clean-up soon and expect big returns. The May bullion product of the following Nevada county gold mines is: Idaho, $42,200; Milton, $60,000; Pittsburg, $9,000. The Excelsior gravel mine, at Smartsville, produced $75,000. Mrs. S. H. Dikeman, of Rough and Ready discovered the croppings of a four-inch ledge in the house-yard a few days since, and proceeded to prospect it. Alpine mines, at Monitor, in the Colorado No. 2, (Tarshish) have developed a new ore body, showing free gold and giving high assays. The same body has been struck 112 ft above the old Tarshish workings.

PLUMAS.

ITEMS.—*National*, June 28: Two men working in the Metcalf claims on Winter creek, below Wilson point, have cleared over $500 in the last six weeks. In addition to this, on Monday last, they found a nugget weighing about $500—nearly pure gold and as large as a man's fist.

SIERRA.

GOLD BAR QUARTZ MINING CO.—*Mountain Messenger*, June 28: This mine is situated near Jim Crow canyon, Sierra county, within four miles of the Sierra Buttes mine. Already $150,000 have been expended in its development. There are over 1,000 ft of tunnels, shafts, drifts and stopes opened and ready to work, with the exception of caves at the mouth. About 10,000 tons of good average ore in sight; vein varies from four to nine ft in thickness, and dips east 45°. The strike is northwest and southeast; formation of walls talcose slate. No machinery is required for hoisting or pumping, and the present tunnel will give from 500 to 1,000 ft back. It is safe to say the ore will average $40 per ton. Free gold is seen in the great mass or bulk of the ore which is refractory to a certain extent. It can be worked by sweating (at an additional cost of $1.50 per ton) and sample amalgamation.

TUOLUMNE.

ITEMS.—Tuolumne *Independent*, June 28: The Soulsby mine, in the last few days, has been uncovering very good rock. In the Hunter and Star King mines a new two-ft vein has been found, which shows free gold all through. The Spring Gulch mine improves in appearance the deeper the miners go. The Humbug & New York tunnel company's consolidated property has been sold to Moyle Bros., of Rawhide, and they are now opening the old tunnel on the west side of the mountain.

TRINITY.

TAYLOR FLAT.—*Journal*, June 28: This flat lies on a horseshoe bend on the Trinity river in a rich auriferous gravel. The bedrock supporting the gravel is about 30 ft above the river, the gravel rising from 40 to 00 ft above the bedrock. The gold scales and flakes are disseminated and evenly distributed throughout this vast area of gravel, which has been so thoroughly tested along its mile and a quarter of water front, and in the interior of the flat by shafts, that the amount of gold contained can be computed with a great degree of certainty. The very lowest estimates of the quantity and value of this gravel by reliable experts is 15,000,000 cubic yards, of a minimum value of 50 cents per cubic yard, or $7,500,000 gross product. This is a placer or hydraulic mine, in which water, under a high pressure, does the work, and very cheaply, too. The water is obtained from French creek, one and a half miles above the gravel deposit. The creek is fed by perpetual mountain snows at its source, 60 miles to the north. Three miles from the gravel the water has an elevation of 250 ft.

NEVADA.

WASHOE DISTRICT.

SUTRO TUNNEL, June 30.—To-night the mountain tops overlooking the Washoe silver region and the Carson valley are ablaze with bonfires, and the echoes of cannon and discharges of Giant powder are heard in every direction. The event which is being celebrated is the final completion of the Sutro tunnel, for the reception of water from the Comstock mines, after 10 years of ceaseless labor day and night, and the expenditure of $6,000,000. The powerful engine of the combination shaft of the Hale & Norcross and Savage mines was started up this morning at precisely 6 o'clock, discharging their water into the Sutro tunnel, at the mouth of which it made its appearance in 1 hour and 20 minutes, showing a temperature at least of 101°, which gradually increased to 113°. In 8 hours the water in the long drowned-out mines was lowered 100 ft. Everything worked to a charm. The wooden boxes, constructed of three-inch tongued-and-grooved Sierra Nevada pine, did not show a leak, and not even a particle of steam escaped from them, so that the tunnel, after the hot water was turned in, showed barely an increase of temperature. The water from the Sierra Nevada, Union, Ophir, the Bonanza mines, Best & Belcher, and Gould & Curry, will not be turned in for a couple of weeks; and after all finds its way into the tunnel it is expected that one of the double-line of boxes will have ample capacity to carry off all the water.

BELCHER.—*Enterprise*, July 1: Incline has reached a depth of 80 ft below the 2760 level. East drift from the 2760 station is in 141 ft, the face showing soft porphyry. The face of the south crosscut on the 2560 level is in fine looking quartz.

COLIN & CURRY.—East drift on 1700 level has been extended 20 ft during the past week. Total length of drift, 973 ft.

BULLION.—Incline winze from the 2150 level has been sunk a total length of 51 ft.

HALE & NORCROSS.—The 8th station has been completed. It has been re-timbered with 10-inch timbers, and enlarged so that it is now 18 ft wide, 72 ft long and 10 ft high. Repairs to the south compartment of the main shaft are progressing well.

TROJAN.—The north drift from the upraise, 2d station, has been advanced and timbered 26 ft, through quartz and porphyry; total length, 109 ft. From the face of the northeast drift, 3d station, drift is west 26 ft, through bright lively quartz. West crosscut, 428 ft from the shaft, has been extended 12 ft through quartz and porphyry. Crosscut, 473 ft from the shaft is in 22 ft, through quartz carrying a little ore.

SAVAGE.—Repairs have been made on the vertical shaft incline, 1640 drift, and new cylinder boilers have been put in the north air compressor.

CHOLLAR-NORCROSS-SAVAGE.—Repairs to pump shaft have been completed.

NIAGARA.—North and south lateral drift, 500 level, have been run 36 ft, following in the course of a very promising ore vein, assays from which run from $14 to $80. The faces of both are in porphyry, with spots of ore carrying low assays.

EXCHEQUER.—North drift on the 2400 level has advanced a total length of 527 ft.

YELLOW JACKET.—New shaft is 2636 ft deep, working well. The 2500 east drift is in 305 ft. West drift is in 244 ft, leaving 25 ft to connect. Progress in this drift is very slow, owing to hardness of rock.

EUREKA DISTRICT.

ITEMS.—*Sentinel*, June 29: Within the past two days 108,000 pounds of bullion and five cars of flue dust have been shipped by the Eureka Con. In the Hamburg the winze below the 600 level is in good ore. The rock of the west crosscut is somewhat softer. A considerable body of extra good ore has been found in the old works, immediately above the top of the winze from the east crosscut on the 250 level. In the Fourth of July the face of the drift from the lower tunnel level is in soft vein matter, showing considerable ore. At the North Bonanza mine the north crosscut on the 200 level has reached a splendid clay wall, along which it has been driven some distance to the northward. The main north drift, from which this crosscut was started, has been swung round to the west and has struck the same well-defined clay wall at a point 100 ft north of where it was reached by the crosscut. At this point an upraise will be made to reach the Rule winze, and at the same time the drift will be continued along the clay to the northward. This clay is as smooth as a plastered wall, and is perfectly regular in dip. Just inside of it will no doubt be found the ore body. Crosscutting may be done at this point at any time. The ore can be reached in a very short time after the word to advance to it has been given.

PARADISE DISTRICT.

ITEMS.—*Silver State*, June 30: Messrs. "Brick" Palmer, Murphy and "Big Nick," struck the south extension of the Bullion mine last week. The ledge is four ft wide, the ore looks well, and the average of five assays shows it to be worth $155 in silver per ton. The Arthur ledge was struck in the lower tunnel the other day by Alexander Middleton. The ledge is dipping east, and shows well in mineral. Several assays of ore from the Red Deer were made this week, showing $125.30 in silver per ton.

ELKO.—The mining country northeast of Island mountain contains both quartz and placer mines, the latter of which can be made to pay about $10 per day to the man, as soon as a sufficient quantity of water can be got upon the ground. There is an abundant supply a few miles distant from the best locations, the expense of conducting which to the mines is heavy. The quartz claims thus far, have developed nothing important.

WILLOW CREEK.—Rich ore has been found in a new opening on the Ethan Allen mine, on Willow creek. It assays $186.67 in silver to the ton, and contains 65% lead.

PIOCHE DISTRICT.

CLEAN UP.—Pioche *Record*, June 21: Eight bars of bullion, valued at $11,341.10, came up from the Dry Valley mill on Wednesday evening. This is the final clean-up of that mill, it having now closed down, and there is no knowing when it will be started up again. The immense pile of wood that used to be there is exhausted, and also pretty much all the tailings.

CHRISTY BULLION.—The Christy mill and mining company shipped from Silver Reef, on the 14th and 16th of June, bullion valued at $2,224.33.

PIOCHE BULLION.—Bullion to the amount of $17,490.37 was shipped during the past week by Wells, Fargo & Co.

ARIZONA.

TOMBSTONE.—*Sentinel*, June 21: About $19,000 of bullion was shipped for this mine from Tucson last Tuesday. Everything at mines and mill is working smoothly upon an ample supply of rich ore. The Contention mine has ore ready for extraction, the value of which is variously estimated at from $1,000,000 to $3,000,000. A 40-stamp mill is about to be erected at this mine.

PICACHO MILL.—A huge lump of retorted gold was turned out from the Picacho mill a few days ago; value, $2,000, the product of 125 tons of ore. The quantity of ore now developed in the Picacho mine is immense, and amply sufficient to supply the 15 stamps of the mill for many years.

AJO MINES.—Work upon the old Ajo mines has been resumed on a small scale, and is already developing ore of singular beauty and of high percentage in copper. Their easy distance from the railroad, 45 miles over a good road, makes it possible to ship the ores with profit.

MOHAVE COUNTY MINES.—The mines in Mohave county are being worked by the Southwestern mining company. Some 126,794 pounds of machinery and supplies have arrived the past week, including over 2,000 pounds of powder, a fine new engine, a Blake crusher and a Davis pulverizer. The engine has a 10-inch cylinder and could work 30 stamps.

ITEMS.—Phœnix *Herald*, June 25: Senor Gavilondo, of Magdalena, has made a rich find near his ranch at Babasac. The rock is a very rich copper glance about four ft in width. Assays at the mint at Hermosillo ran as high as $4,000. Average assays made in Tucson ran about $390 per ton.

PINAL COUNTY.—Prescott *Enterprise*, June 21: The Stonewall mill is now well supplied with water from the Hannibal and Stonewall shafts, and is running full time. Ore most abundant. Another rich strike has recently been made in the mine, showing native silver. The grading for the new roasting furnace, soon to be erected at the Haskin mill, is well advanced. It is at the northwest end of the mill building on a line between the battery and pan rooms. We understand that at the depth of 150 ft a great improvement is visible in the ore body of the Independence lode. It is richer than it has been heretofore, is more compact and more abundant in quantity. Mr. H. C. Hoffman, of McMillen, has just had 55 pounds of ore specimens worked at the Haskin mill, and as the product was 19 pounds 6 ounces of bullion, nearly 800 fine, our readers will understand that the Globe district ores are unusually rich. The specimens referred to came from different mines in the district.

COLORADO.

LEADVILLE.—*Courier*, June 26: The Highland Chief and Highland Mary have been consolidated. The property is valuable. In one shaft the ore is said to be 14 ft thick, and at another, 21 ft thick, carrying from 50 to 200 ounces in silver, from 35% to 60% in lead, and containing but very little waste rock mixed in it. The present product is 50 tons daily.

MINING NOTES.—Cleora *Journal*, June 21: On the Cunnison & San Juan a gold lead was discovered a few days ago, carrying free gold from rock down three ft. The rock assayed $3,400. The Gold Fleece, located at Picayune gulch, two miles from Animas forks, produced surface ore assaying as follows: Gold, 8,051 ounces; coin value, $161,420; silver, 5,598 ounces; coin value, $6,269.76; total, $167,280.76. From 300 pounds of second-class ore, was obtained, by mill run: Gold, 10 ounces; silver 53 ounces. From 1,381 pounds third-class ore, was obtained:

Continued on page 12.

The Australian Bustard.

The very interesting specimen of the feathered tribe which adorns our first page this week, is known as the Australian bustard *(Otis Australasianus)*, and is the largest and handsomest of that family of birds.

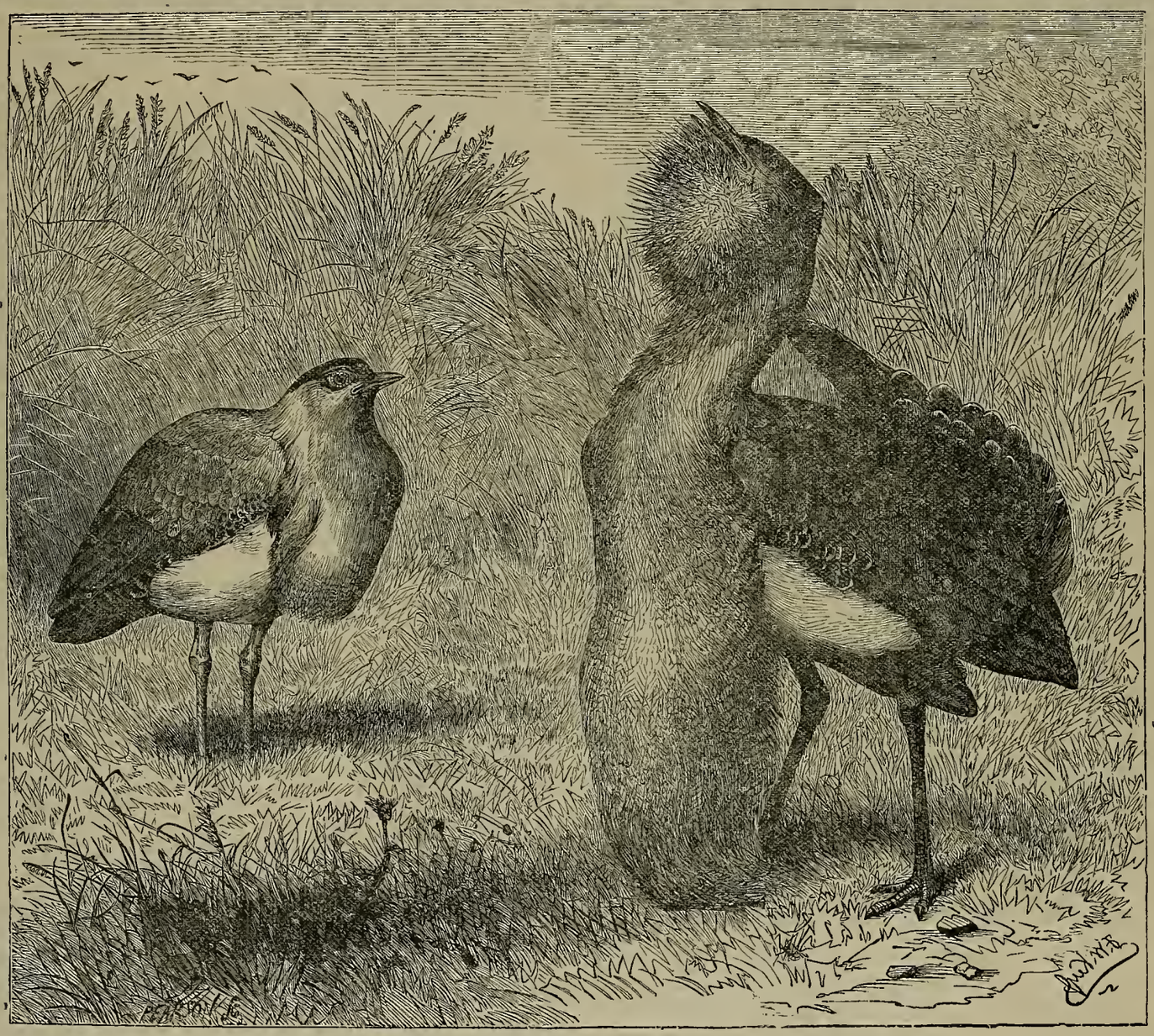
The bustard inhabits the grassy plains of Europe, Asia and Africa, none being found upon our own continent. They vary in size according to species, the great bustard weighing from 25 to 30 pounds.

According to Gould, the Australian bustard exceeds in size the European, standing higher upon its legs and having a longer neck. When seen at freedom no Australian bird, save the emu, is so majestic or assumes in its carriage so great an air of independence. The male, whose weight is from 13 to 16 pounds, greatly exceeds the female in size, and from the greater length of the plumes of the neck is much more stately in appearance.

The bustard is so shy and runs with such marvelous rapidity when once alarmed, that great care is required hunting them. To succeed in getting near, it is necessary to bring in the aid of a horse, and to approach in circles, gradually closing in upon it before it takes wing, which it readily does by running a few yards, thereby gaining an impetus, which enables it to rise. It flies heavily, with its long neck stretched out to the utmost, but it is capable of sustaining flight for a considerable distance.

As an article of food it is said to be delicate and well flavored, surpassing the turkey of the European country. It breeds in the latter part of September, the situation chosen for the purpose being a clear spot in some valley or on the side of a grassy hill. The eggs are usually deposited on the bare ground; occasionally a few sticks are spread for them to lie upon.

A very striking peculiarity that will be noticed about the larger bird (the male) in the engraving, is the long pouch which adorns its breast, and which, when inflated, reaches almost to the ground. This development is said to be peculiar to the breeding season, and is connected with the vocal organs, which, at that time, are much exercised.



THE AUSTRALIAN BUSTARD OR NATIVE TURKEY OF AUSTRALIA—Otis Australasianus.

THE MANUFACTURE OF PHOSPHORUS.—Various mineral phosphates, said Mr. James Readman, before the Glasgow Philosophical Society, are now used in the manufacture of phosphorus. Bone ash is no longer remunerative, on account of its high price. Among the varieties of mining phosphates are Canadian, German or Nassau, Charleston and Sombrero phosphates. The first stage in the manufacture of phosphorus is to decompose the phosphate of lime completely in a large cylinder with sulphuric acid of 110° to 120° Twaddell, with constant agitation. The sulphate of lime is then filtered off, and the filtrate is evaporated to about 80° to 90° T., and then allowed to cool. It contains over 25% of phosphoric acid. It is then mixed with coarse wood charcoal and dried in a muffle furnace. The proportion of charcoal to liquor is one to five. This substance contains the phosphoric acid in a partially insoluble state, so that it is different in its properties from meta-phosphoric acid. The mixture is then transferred to retorts of Stourbridge clay, capable of holding 30 to 40 pounds. The malleable iron pipe through which the phosphorus distils is then luted on, and the heat is raised to bright redness. The phosphorus distils over and is condensed in water. It only remains to cast it in molds, when it is sent to market. Mr. Readman, in contradiction to usual assertions in text books, called especial attention to the fact that monophosphate of lime is not used as a source of phosphorus, for the lime takes up valuable room, and the compound requires a much more intense heat to effect its decomposition. Redonda phosphate of aluminum is regarded by the author as the future source of phosphorus, but as yet no attempt to procure phosphorus from it has been pecuniarily successful.—*Iron Age.*

Arizona Mines.

The Silver King mine, situated in the northern part of Pinal county, Pioneer district, in a basin at the foot of a steep mountain range, was discovered in 1875 by C. G. Mason, B. W. Reagon, W. L. Long and Ike Koplin, and was the first location placed on record in Pinal county. The vein matter is quartz, the minerals consisting chiefly of chloride and black sulphurets, with quantities of pure silver in nuggets. The old shaft is down 257 feet, and drifts and tunnels in all directions show that the mineral is not only deposited on top of the ground, but extends down into mother earth. A new working shaft has also been commenced which is to be sunk 1,000 feet. There is now in sight, by actual miners' measurement, $1,000,000 besides $750,000 worth of ore on the dump and tailings at the mill, which latter are to be reduced by amalgamation, a process the company is about to introduce to their otherwise perfect mill, and thereby save that which is lost by present process. The entire cost of the mill was $60,000. Wood and water are in the vicinity of mine and mill, and the property is distant from terminus of the Southern Pacific railroad but 60 miles. The ore is hauled from the mine to the mill, four miles, in wagons. About 50 men are employed by the company. Picket Post and the town of Silver King both show considerable activity.

The ill-omened title borne by the Tombstone district indicates the ready wit of the hardy miners in coining names for new places, and also the pertinacity with which a name will stick to a man or place when it has once taken popular hold. The story as to the origin of the name given to the district is, that two young miners, brothers, named Schæfln, had reached Tucson in the early part of last year, on a prospecting journey. While there they heard of some likely indications that had been seen on the hills around the San Pedro river, about 70 miles away from Tucson, and made up their minds to go and prospect there. They were strongly advised by their friends not to go on what they considered a fool's errand, and told them they would find their tombstones there and nothing else. "All right," replied the boys, "tombstones let it be, if we can't do better, but we will chance it." And away they went, up amongst the wild hills where the attack of the treacherous Apache was no less probable than the miners' every-day risk of accident and starvation. But none of these mishaps befel the brave lads; they were singularly fortunate in lighting upon a magnificent vein of silver ore, which piece of good luck was followed by the discovery of other veins equally valuable, in the same neighborhood. A mining camp was immediately organized by the discoverers, who, in derision of the dismal forebodings of their friends, gave it the doleful name of the "Tombstone" district.

Silver mountain, just south of the Bradshaw range, is attracting considerable attention; in fact, all the leads of gold and silver that stand out so prominently in the Peck, Bradshaw and Tiger districts seem to tend toward Silver mountain as their objective point, and to culminate, as it were, in a grand fountain head, a monster ledge which has its home in Silver mountain. This ledge has been named the Mammoth, and is at one point 150 feet between casings, and shows mineral for a distance of three or four miles across the mountain. No work has yet been done on any part of the ledge, so as to determine whether there are rich ore chutes or not, and it will take a large sum of money to prospect it, consequently, it may be some time before the world will know its value.

PHOSPHORESCENCE.—In a certain butcher's shop all the meat became strongly phosphorescent and remained so as long as sound. If putrefaction set in and *Bacterium termo* made its appearance the luminous appearance ceased. None of the customers of the meat experienced any inconvenience from its use, and no similar phenomenon was traced in other butcher's shops in the neighborhood.—*M. Nucesh.*

The Engineer.

River Taming in England.

The English government is now at work on a problem which is engaging attention in this State, and in other parts of the world, viz., the devising of some method by which the surplus water from the mountains may reach the sea without the destructive floodings of the low lands, which now follow the rain storms or snow meltings on the highlands. In England, this flooding of low-lying districts has become more destructive during recent years, because the systematic ditching and underdraining of the uplands give quick passage through the soil into the rivers to the surplus water which formerly was long held on the surface or percolated but slowly through the soil. We find but meager information concerning the provisions of the act which is now before Parliament for the averting of floods, and can do but little more than state the fact without description of methods proposed. It may be said, however, that the subject has been studied by a royal commission and that a scheme has been elaborated from the report of their investigations. The *Agricultural Economist* thinks that the whole project is endangered by the fact that the proposed act orders that a part of the expense of carrying off the water shall be taxed upon the uplands whence the waters come. This, our exchange thinks, will awaken much opposition to the contemplated improvements. We suppose the uplands will hold that as water is prone to run down hill, it is no fault of the hill, but the iniquity is rather in the water, and if those below do not care to suffer injury they must get out of the way, or else corral the water so that its destructive power is held in check. This it is proposed to do by widening the rivers, and the power to carry out these improvements is to be vested in "River Conservancy Boards," who shall have full authority to condemn adjacent property, mill rights and the like, as their plans may require. One recommendation of the report is, that all arterial streams insufficient to carry their waters after heavy rains be widened very considerably indeed, and that the new banks be formed gradually shelving down to the banks of the stream that they may be available to bear grass either for mowing or for feeding of stock, when the waters are low. If this were carried out, the conservancy boards would no doubt let these river banks by the season, the revenue derived from which would lighten the taxation for the conservancy rate. Although most of the rivers would require considerable widening, this shelving bank system might, in a great measure, prevent the waste of land which would take place if conducted on any other principle.

In addition to preserving the lowlands, it seems that the system of upland reservoirs, for irrigating low land meadows, is also contemplated, and this the *Economist* regards as a very promising feature. This has also been proposed for our own turbulent rivers. It is interesting to note the testimony brought forward in England in favor of irrigation, and comparing their moist climate with our arid one, we can but say if irrigation will do these things in the green tree, what will it do in the dry. Our exchange says that if "there is one thing we are behind in more than another in our British husbandry, it is in making that extensive use of water which is made on the continent and in the East by processes of irrigation." It then proceeds to read English feed growers the following lesson: "The recommendations of old Arthur Young for laying out fresh water meadows might still be studied to advantage by the owners and occupiers of numerous districts, and as to benefits derivable therefrom, the same writer records an instance where nearly five pounds an acre was realized for the feed of a water meadow during six weeks of spring, and that nearly two tons per acre of hay was reaped from the land afterwards the same summer, which, together with the after-grass in autumn, made a splendid return. Yet when the same meadow could not be irrigated owing to some disputes respecting the water rights, very little whatever was grown on it."

These propositions to curb rivers from their wild work and harness them forever in the service of the farm, is one of the most interesting and important which is now advanced for agricultural engineers to reduce to practical operation.

Gold in Russia.—The St. Petersburg papers report a great development of the gold production in Russia. Strata containing gold dust in considerable quantity have recently been discovered in the Ural mountains. It is said that in the district of Sennigsei a Russian proprietor has found in his gold mine, near Motygym, a nugget 445 pounds in weight, representing a value of nearly $75,000.

Sixty-three years of age is said to be the grand climacteric or turn of life, a critical period for masculine humanity, more men dying at that age, or near it, than at any other, leaving accidents and violent deaths aside. A like critical period for feminine humanity is 47 years.

Useful Information.

Asphalt and Timber Floors.—A new method of laying down floors has been adopted in France, and is said to have obtained a wide application. It consists in putting down a floor, not as hitherto, on joists, but in embedding the boarding in asphalt. The new floors are used mostly for ground stories of barracks and hospitals, as well as for churches and courts of law. Pieces of oak, usually 2½ to 4 inches broad, 12 to 30 inches long, and one inch thick, are pressed down into a layer of hot asphalt not quite half an inch thick, in the well-known herring-bone pattern. To insure a complete adhesion of the wood to the asphalt, and obtain the smallest possible joints, the edges of the pieces of wood are planed down, bevelling toward the bottom, so that their cross section becomes wedge-like. Nails of course are not necessary, and a perfectly level surface may be given to the flooring by planing after the laying down is completed. The advantages of this flooring, which only requires an even bed upon which to rest, are said to be the following: 1st. Damp from below and its consequences, rot, are prevented. 2d. Floors may be cleaned quickly and with the least amount of water, insuring rapid drying. 3d. Vermin cannot accumulate in the joints. 4th. Unhealthy exhalations from the soil cannot penetrate into living rooms; asphalt being impermeable to damp, rooms become perfectly healthy, even if they are not vaulted underneath. In buildings consisting of several stories, as in hospitals, the vitiated air of the lower rooms cannot ascend, an object which it has hitherto been impossible to attain by any other means. 5th. The layer of asphalt will also prevent the spreading of fire from one floor to another in case of conflagration.

Heptane.—Six or seven years ago ahietene, a hydrocarbon obtained by distilling the exudation of the nut pine or digger's pine of California (*Pinus sabiana*), was introduced in market and sold in a crude state under various names, and is now used for removing grease spots, etc. It is aromatic, colorless and very liquid. Chemists lately made a pretty thorough chemical and physical examination of this ahietene, and found it to consist mainly of pure heptane—a substance the other known natural sources of which are petroleum and fossil fish oil. The occurrence of a paraffine playing the part of oil of turpentine in a tree now living is exceedingly interesting. In ordinary turpentines a paraffine-like substance has been found, but only in very small quantities. The composition of the oil of the *Pinus sabiana* probably varies at different seasons, as sometimes the nuts tasts strongly of turpentine, and at other times they have hardly any of that flavor.

Sea Weeds for the Herbarium.—The recipe for pressing sea weeds for preservation used by the Rev. A. B. Hervey, of Troy, N. Y., well known as an expert in that process, is as follows: Float out each specimen by itself in salt water, in a white dish, like a washbowl. Put the paper under the plant in the water; arrange the plant on the paper and carefully draw it out. Lay the paper with the plant upon it on drying paper and spread over it a piece of white muslin. Then spread over this a layer of drying paper, then more plants, and then more cloth, drying paper, etc. Put all under a board, and weight it with 40 or 50 pounds of stone or other heavy substances. The next day change the cloths and drying paper, and in one day more the plants will be dry and ready to go into the herbarium or the album for permanent preservation.

Imitation Inlaying.—Suppose I want an oak panel with a design inlaid with walnut. I grain the panel wholly in oil. This is not a bad ground for walnut. When the oak is dry, I grain the whole of the panel in distemper. I have a paper with the design drawn thereon, the back of which I rub with whiting, place it on the panel, and with a pointed stick trace the design. I then with a brush and quick varnish trace the whole of the design. When the varnish is dry, with a sponge and water I remove the distemper, where the varnish has not touched. This, if well executed, presents a most beautiful imitation of inlaid wood. Marbles are executed in a similar manner.

Babbitt Anti-Friction Metal.—The metal is made of one part copper, three parts tin, two parts antimony, and three parts more tin are added after the composition is in the molten state. This composition is called hardening, and when the metal is used for filling boxes, two parts tin are used to one of hardening. The above alloy constitutes the best anti-attrition metal in use, but on account of its expense it is very little used. The anti-attrition metals commonly used are principally composed of lead, antimony, and a little tin, but they are not nearly so good as the above.

Paste to make Paper Adhere to Tin.—Soften 4 parts of glue in 15 of cold water, and then moderately heat until the solution becomes quite clear. Then add 65 parts of boiling water, and agitate. In another vessel stir up 30 parts of starch paste with water enough to form a milky liquid without lumps, and into this pour the boiling glue solution with constant stirring. Continue the boiling for a few minutes, and add, after cooling somewhat, a drop or two of carbolic acid to each gallon of paste. Keep the paste in closed vessels.

To Temper Drills, Gravers, Etc.—Select none but the finest and best steel for your drills. In making them, never heat higher than a cherry red, and always hammer till nearly cold. Do all your hammering in one way, for if, after you have flattened your piece out, you attempt to hammer it back to a square or a round, you spoil it. When your drill is in proper shape, heat it to a cherry red, and thrust it into a piece of resin or into quicksilver. Some use a solution of cyanuret potassa and rain-water for tempering their drills, but for my part, I have always found the resin or quicksilver to work best. Gravers and other instruments larger than drills may be tempered in quicksilver as above; or you may use lead instead of quicksilver. Cut down into the lead, say half an inch; then, having heated your instrument to a light cherry red, press it firmly into the cut. The lead will melt around it, and an excellent temper will be imparted.

How to Make Court-Plaster.—Soak isinglass in a little warm water for 24 hours, then evaporate nearly all the water by gentle heat, dissolve the residue in a little proof spirits wine, and strain the whole through a piece of open linen. The strained mass should be a stiff jelly when cool. Now stretch a piece of silk or sarsanet on a wooden frame, and fix it tight with tacks or pack-thread. Melt the jelly and apply it to the silk thinly and evenly with a badger hair brush. A second coating must be applied when the first has dried. When both are dry, apply over the whole surface two or three coatings of balsam of Peru. Plaster thus made is said to be very pliable and never breaks.

Emery Belts and Wheels.—A correspondent says that most users of emery belts and emery wheels do not use glue that is thick enough, fearing it may chill before the sand or emery can be spread In making an emery wheel or belt, if the cloth has never been glued, it should be sized with glue about as thick as lard-oil, and allowed to dry thoroughly before applying the glue which holds the emery. Have the emery heated to 200° Fah., and coat the belt or wheel with glue about as thick as molasses and roll it in the hot emery. If a wheel or belt thus treated is allowed sufficient time to become thoroughly dry, it will be very serviceable.

How to Make Plaster of Paris Hard enough for Turning.—Mix with fresh plaster of Paris from two to four per cent. of powdered marsh mallow root, then add sufficient water until it forms a mass. This will set in about an hour and become so hard and dry that it may be sawed and turned. It is used in the manufacture of domiones, dice, etc. When eight per cent. of the root is added a still harder mass is obtained which may be rolled into leaves and painted or varnished. A small quantity of alum added makes it set harder and quicker.

Purity of Milk.—It is stated in a German paper, that the purity of milk may be tested by the following very simple method: A well-polished knitting needle is dipped into a deep vessel of milk, and immediately withdrawn in an upright position; when, if the sample be pure, some of the fluid will be found to adhere to it, while such is not the case if water has been added to the milk, even in the smallest proportions.

Good Health.

Hyposulphite of Soda in Erysipelas.

Anthony's Bulletin contains the following concerning the hyposulphite of soda as a remedy for erysipelas: "When erysipelas proceeds from a wound, it is more delicate to manage, and requires the best surgical skill; but when it is of the milder form, on the outside skin in the face or any other part of the body, proceed as follows: Take of hyposulphite of soda any quantity, and make a saturated solution in a bottle of any convenient size—six, eight, or ten ounces. If the individual is a strong, hearty man, and the disease has a good start, give your patient one tablespoonful every hour for twelve hours; then decrease the dose, as the benefits become manifest, say once in three hours. It may cause diarrhea; but never mind, it will destroy any febrile symptoms. Twenty-four hours is generally sufficient to produce a decided change for the better, unless it has six or seven days' start, in which case it will take longer. The results are generally so wonderful that I have never known the remedy to fail. With an old person you may substitute a teaspoonful for tablespoonful, and once every two hours. You may put this down: that the sooner you can get a good quality of the soda solution into the body, the sooner the trouble will be over. Now, for an outward application: use equal parts of the soda solution and glycerine; saturate cotton flannel with the above, and lay on the part affected. Eat simple food—avoid all exciting food and drink; farinaceous diet is absolutely necessary. If you can bathe the part affected with the above solution, do so; then lay on the saturated cotton.

"Hypo is equally as efficacious in any poisons from insects or vegetables; old wounds in sores are healed by washing the parts in a solution of soda. It is also good in typhoid fever, carefully administered.

"Now, if a person has a form of erysipelas that is not so decided, but (say) chronic, let him take a teaspoonful every night of the solution, and the disease will be entirely removed, if kept up for a month. The disease seldom or never attacks a person the second time when eradicated by the soda treatment."

Food and Digestion.

In a lecture before the Workingmen's Lyceum, Dr. Seguin spoke as follows of food: "An ordinary meal is generally composed of five ingredients—animal or nitrogenous food, starchy or sweet food, watery vegetables, beverages and condiments. This food when digested is taken into the system by blood vessels. For persons, and especially for workingmen, in this climate, meats are the most easily digested, and at the same time are the most nourishing food. Tripe is the easiest and pork the hardest to digest. Among vegetables, rice and boiled cabbage are the extremes. Anything that is boiled in fat is extremely indigestible. Milk contains the five ingredients referred to above, and so is really 'all-sufficient.' Mothers make a great mistake in trying to induce infants under two years of age to eat starchy food, for there is no alkaline fluid in the stomach of an infant by which the starch can be changed to sugar, and so infused into the system. It has been estimated that a man working in the open air daily needs 15 ounces of meat, 18 ounces of bread, 3½ of butter or fat, and 51 of water. I agree with many eminent chemists who have proved that alcoholic drinks are an aid to the system in retarding the waste of tissues. So, too, for the same reason, I regard tea and coffee as nourishing. An excess of starchy food is to be carefully avoided. Men who handle lead ought to abstain from alcohol, for if too much is taken the kidneys, which throw off the poison of the lead, are likely to become diseased."

Nature has supplied an infinite variety of food to suit every taste and the gratifications of every stomach. "What is one man's meat is another man's poison," is an old and true saying. The whole of good health may be concentrated in the simple observation to "eat only what agrees with you." Volumes of information can give no better or other advice. No physician can prescribe a more efficacious remedy.

Child Murder.—The butchery of the Freeman child at Pocasset strikes everyone with horror. Yet the brutal father accomplished directly what is being accomplished indirectly and unintentionally, in many instances, by parents who either neglect their children or remain in willful ignorance of the ordinary and proper laws of health. The command to increase and multiply meant something else than the mere bringing of children into this world to assassinate them by degrees after they are here. While pouring out oceans of blood and volumes of words to maintain the rights of full-grown men and women, the making of men and women in the proper mind and body, by the proper training of children is overlooked in a great measure. And any religious zeal which prescribes a sickly diet for mind and body and restrains the exuberance of childhood by too great a solemnity, is murder not so speedy, to be sure, but fully as wicked as the Pocasset tragedy.

The Teeth.—As the result of numerous trials made by the exposure of recently-extracted teeth to the exposure of various substances, M. Maurel comes to the conclusion that if various medicinal substances are injurious in their action on the teeth, others in still larger numbers prove, in their habitual employment, quite inoffensive. Thus, if we are required to take great precautions respecting citric acid, tannin, chlorides of zinc and antimony, perchlorids of iron, sulphate of copper and alum, we may continue to employ with complete safety arsenious and carbolic acids, vinegar, corrosive sublimate, chloride of potash, alcohol, tincture of benzoin, essence of mint, tincture of quinine and eau de cologne. Tobacco, whether used in chewing or smoking, does not injure the teeth beyond their discoloration.

Disease Germs.—C. Von Nagell, a Bavarian investigator, while he retains the idea that the smallest organisms, fungi, are the cause of all infectious diseases, holds that only these germs are dangerous and calculated to infect which enter our organs of respiration with the air we breathe. If Von Nagell's theory should prove true, and find general acceptance, it would be no longer necessary to trouble ourselves about the generation of products of decay in masses of liquid, as in sewers, canals, damp soil, river and spring waters. On the other side every means must be employed to prevent these fungi diffusing through the air as a result of the drying up of such decaying masses.

Properties of Glycerine.—Glycerine should not be rubbed on the skin in an undiluted state. One of its remarkable properties is its power to absorb moisture, and hence its irritating effect on the skin. About three fluid ounces of water to one of glycerine will form a mixture which will neither attract moisture nor evaporate, the weight scarcely varying from week to week, either in one direction or the other. The mixture should be kept in a cool, moist place and used as required.

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The Week.

The most noteworthy event of the week in the mining world is the final completion of the Sutro tunnel, consummated after an almost uninterrupted prosecution of the work for nearly ten years. Some finishing up remains to be done on the great adit, but in its readiness to receive and handle all the water from the Comstock lode it accomplishes the main object of its construction and relieves the mine owners from a service that had already become troublesome and costly. They are now in a position to go on and prove the lode in depth, and make their ores profitably available if they exist in sufficient quantity and reach even a medium grade. As the Tunnel company are dependent on the resources of the mines for revenue, it is as much to their interest as it is to that of the mine owners themselves that valuable ore bodies should now be developed, wherefore it may be expected that these parties will now bury the hatchet and hereafter work harmoniously together. The weather in the interior continues favorable to mining operations, the snow lingering on the mountains and keeping the hydraulic claims well supplied with water. Bullion receipts during the past week have been fair, shipments from the hydraulic mines having been liberal and from all parts of California fully up to the average at this season of the year.

MEXICAN COMMERCE.—The actual annual commerce of Mexico with other nations, according to the latest official data, is as follows: Imports, $29,500,000; exports, including $22,000,000 of precious metals, $28,750,000; total, $58,250,000. Compared with the population the total equals $5.82 for each inhabitant, while the United States equals $27 per head, Cuba $120 per head, Spain $17 per head.—*El cinco de Mayo.*

In Memoriam.

Bereavement presses heavily upon us. At her home in this city, on Sunday morning, died Hosapher N., wife of Warren B. Ewer, senior editor of our publications. She has suffered long and patiently, hoping against hope, that the malady which had fastened upon her would loosen its grasp and restore her again to her beloved ones, to her wide circle of friends—again to the life of kind thoughts and gentle deeds in which she delighted. But the God in whom she trusted willed otherwise. On Sunday morning, fatigued with pain of unusual severity with which she had battled, she fell asleep, and while her devoted husband and attendants rejoiced to think the quiet slumber would refresh her, she peacefully crossed the river. Her loss is bereavement beyond words to those of her immediate household, and in the larger circle, in which her presence was a ray of sunshine and an influence toward purity of thought and nobility of conduct, the tributes to her memory are tender and heartfelt.

Mrs. Ewer was born in 1817 in Havana, Cuba. In youth she removed to the old commonwealth of Massachusetts, and there she and her future husband began an acquaintance as playmates which ripened into mutual affection. During seven years of plighted troth they awaited their marriage, and since then 40 years of union have cemented their lives together. During their early married life she was an invalid for many years, and the sympathy quickened by this experience knit them the closer. Mr. Ewer came to California in 1849, and his wife followed him four years after. They resided in Grass Valley about 8 years, making many friends. For 17 years they have lived in San Francisco. Four children were born to them, one dying in the full vigor and promise of early manhood; another, a devoted daughter, still survives her mother. This daughter and an elder sister, both in delicate health, Mrs. Ewer leaves in charge of her bereaved companion.

The life of Mrs. Ewer was one of nobility, and her heart was full of generous impulses. In deeds of charity she was constant. Her work lay in those quiet actions in behalf of the suffering and the unfortunate, of which the world never knows, as well as in organized efforts for wider charities. She was one of the lady members of the Board of Managers of the "Sailor's Home" in this city. This project was very dear to her, and while her strength lasted she gave it generous and self-denying promotion. As a member of the Union Square Baptist Church of this city, she lived a consistent Christian life and was earnest in every good work. Frankness in words, firmness and decision in character, with unswerving devotion for the right and kindness toward all in the least deserving—these were strong characteristics of her life.

Mrs. Ewer possessed what may be truly called a sunny disposition. In her friendships she was most honest and outspoken, and one of the results of her illness, which she most deplored, was her separation from her friends. Her conversation was full of the charm of animation, and while it disclosed thoughts born of wisdom and research on the themes she preferred, it was always warmed by true womanly sympathy and genuine philanthropy. She was the life of the social gathering, the light of her home, an influence toward the elevation of all who came within the circle of her acquaintance. Thus she will be widely mourned, and the sense of loss, itself the highest tribute to the worth of one departed, will press itself upon many a mind and heart. Though a great sufferer for many months she retained her kindness of disposition amid all her sufferings, and one of her greatest trials was the burden which she placed upon those who loved her—a burden which was lightly borne because of her hold upon the hearts of those who ministered to her.

She has gone hence. During her lifetime her trust was full and her faith serene, and to such souls to die is gain. Not to her, but to those whom she has left behind are honest words of sympathy fitting. To our associate, to whom for 40 years she was a loving wife and true companion, we extend the most heartfelt assurances that we grieve with him in his bereavement, because we know how much a part of his life her presence and companionship had become. He and his daughter are bereft and alone—and yet not alone, for love and memory do not die. Theirs it is to cherish a memory which will always come to them, sweeter far than fragrance of flowers; more precious than anything of earth can be, for their treasure is now beyond the pain and suffering of earth, in glad possession of the peace beyond.

The funeral of Mrs. Ewer took place on Tuesday afternoon, July 1st. Both at the home and at the church there were throngs of sympathetic mourning friends. Floral offerings were many. At the church there was a large cross, flower-set, encircled by a wreath of flowers. There was also an anchor of woven blooms. These were regarded by all as fitting emblems of her devotion and faith. An eloquent sermon was preached by Rev. Mr. Ross, pastor of the church and a touching tribute to the christian virtues and noble life of the deceased by Rev. Mr. Hughes, pastor of the Baptist church at the Mission. Both in the public exercises and in the tender words spoken at the home were to be found eloquent testimony to the worth of her they mourned, and assure us that she still lives in the hearts of the community.

Darien Canal.

We shall have occasion to present to our readers in a short time a complete exposition of the proposed canal. In the meantime the resolution offered in the last Congress by Senator Burnside with reference to the foreign ownership of the Darien canal interfering with the Monroe doctrine, has been criticised by the press of France in such a manner as can leave no doubt that Senator Burnside's ideas were correct. It appears from *La Republique Francaise* that the canal will be absolutely neutral territory, and that in consequence America need not fear entrusting the management thereof to foreign hands. This absolutism is just what America has always and will always contend against. Its destruction was the reason of the Monroe doctrine, and the true doctrine of national free will finds an ardent exponent in the American nation. Hampered on every side by the restrictive ties and contracts with nations foreign to this continent, how can this country hope to maintain its prestige? This Darien canal question comes home to our interests, if not more, as much, at least, as our war with England. What the nations cannot accomplish by brute force, they are now attempting to accomplish by diplomatic skill and finesse. "The United States must be checked." It has penetrated to every quarter of the globe with its mechanical and industrial products, and is fast crowding out of the markets of the world the products that heretofore have given European nations their greatness. We cannot afford to permit this thing, and on our own coast the matter is of great importance. The Orient is open to us, and we are gradually commanding its trade. Europe cut off by the natural obstruction of the Western continent, seeks by every effort to cut us off. National ambition to grasp the commerce of the East is the mainspring that moves northwest passage expeditions, and years ago the Darien canal was broached but suspended because it was thought a passage through the Polar sea would be discovered and made available. But now there is no hope of a highway in that direction, so the Darien canal has assumed its complete features. Upon the assumption that the United States can control eventually the commerce of the world, the foreign element on this hemisphere must be kept at a distance, and to Americans belong the right of controlling a highway theirs naturally. The same policy that European nations adopt to protect their commerce, must be adopted and enforced by us; and there is not a nation on the earth that would oppose us in our demands, or that would resist our enforcement of the Monroe doctrine. The star of Europe is setting, while our star of empire is ascending, hence the struggle of Europe to renew its luster at the expense of ours.

Our New Volume.

The MINING AND SCIENTIFIC PRESS, with this, the first number of Vol. XXXIX., enters upon its twentieth year. They have been years of hopes and fears. Our fears generally have proved groundless, and we are glad to say that we have witnessed a growth and progress unparalleled in the history of States. True, population has not increased in proportion to wealth, but on that account our progress has been solid. We believe our efforts to satisfy the demands for a mining and scientific journal have been and will continue to be appreciated, and we shall not spare any efforts to justify a continued and additional patronage. The period of dullness through which we have been passing is not due to local causes, but the business of the whole world has been and still is affected by what may be termed a "business epidemic," the causes of which cannot with certainty be ascertained. The clouds, however, are breaking, and we are sure that the new volume will be able to record a period of unparalleled prosperity, which our mining interests will permit us at present to expect.

The Extrinsic Burdens of Mining.

It argues well for the solid merit of gold and silver mining on this coast that it has been able to stand up and even flourish under the extravagance, fraud and other forms of abuse that, almost from its inception, have characterized the business. Hardly more than a year had elapsed after the discovery of gold in California when the miners, crazed with cupidity and impelled by the wildest vagaries concerning the origin of that metal, its modes of distribution and most apt places of lodgment, were betrayed into every manner of folly in the adoption of means for more speedily gathering it. Even so early as the summer of '49, when the miner with his shovel and rocker could almost anywhere wash out his ounce per day, with fair chance for making a good deal more, multitudes were ready to forego this sure thing and engage in any absurd scheme that promised to insure them larger returns. At that primitive day these men were ready on the slightest hint of rich discoveries elsewhere to abandon their claims and scamper off for the site of the reported find, however vague the rumor or distant the locality.

But, however excitement and follies have attended this calling from the first, not until the era of vein mining was inaugurated did these evils take on those novel and more mischevious forms that have since distinguished that branch of the business. If the early placer miner, misled by false rumors of big things far away, hurried off to remote points only to meet with disappointment and loss, his premature movements wrought harm to himself and no one besides. If, incited by greed, he engaged in ill-advised and ruinous experiments, or embarked his means in visionary schemes, he alone was the sufferer. Very different has it been in this other department of the business. Here, the consequences of the miner's mistakes and the manipulator's misdeeds have not been confined to this narrow scope. They have afflicted all classes, and fallen mainly on those nowise in fault. Here innocent parties have generally been the greatest sufferers. With the advent of this branch of mining came new ideas and new modes of procedure. With its growth there sprang up institutions and practices not in use before. Then, for the first time, incorporated companies, with numerous well-paid officials, luxurious quarters, large amounts of fictitious capital, and their cunning machinery for assessing shareholders, freezing out delinquents and favoring insiders, became common. Then the Stock Exchange, with its accessories, arose stately and potent, an instrument of some good and infinite mischief. Then the broker—the Bull and the Bear—came upon the stage, and corners and pools, puts and calls, and other methods of operating, with much besides of uncouth sound and unsavory morality, first began to be heard of. What has since followed may be inferred from the accumulated wealth of the few and the abject poverty of the many who have much dealt in mining stocks, somewhat also being of record in our bankrupt commissions and criminal courts.

We have alluded to these illegitimate burdens that so oppress mining, not with the purpose of now inveighing against them, but merely to show how inherently sound must be the business that can stand up and prosper under so great a weight. Under so many hindrances no other industry could have made such progress, or even survived for any length of time. It is, in fact, to the great opportunities afforded by mining that these rank abuses have been mainly due. It was because the business could bear them without being fatally crushed that they have been so often perpetrated and so persistently kept up. But a time has come when some check should be put upon these damaging practices, both for the good of the business itself, and the cause of public morality. It is time the tares should be weeded from the wheat, to the end that our bullion harvest suffer not early curtailment. Retrenchment and close figuring is the order of the day. The practice of economy is everywhere becoming a vital necessity. The whole business world is pervaded with the sense of saving. Only here on the Pacific coast does it seem to be absent. Presuming on our position and other natural advantages we are spending and wasting, speculating and gambling as before. This we will have to change. Thus far we have had the field mostly to ourselves. We have been able to largely monopolize the business of mining, with all that pertains to it. But we are going to have competitors. They are already in the field—active, sharp, and accustomed to go for all the chances in sight. In contending with them for commercial supremacy we will need to practice the same caution, vigilance and economy observed by our opponents, and to which they have long been schooled. If we think we can pursue this industry in the old reckless and spendthrift way, and still make advances, or even hold our own, we will soon find ourselves grievously disappointed. We will have to fall into line and keep step with the advancing army of close workers and savers if we are to get on and make money at this business of mining.

AFTER two months' debate the Italian Chamber of Deputies has approved the Ministerial Railway bill, which provides for the construction of 6,020 kilometers of railways within 21 years, at the annual expenditure of £2,400,000.

Copper Mines of Japan.

We translate from the *Moniteur Belge* the following account of copper mines and mining of Japan: While Japan is peculiarly remarkable for her mineral wealth of every variety, her principal source of mine wealth is in the abundance and purity of the copper deposits. Copper is in common use in Japan and is either used pure or alloyed for a great variety of purposes. Every mineral known to Europe is found in Japan, but the most universal is copper pyrites or sulphuret, malachite, azurite and even native copper in beautiful crystals are found in considerable quantities, but the sulphuret alone is utilized in the manufacture of the metal.

The deposits are very numerous, the pyrite is generally enveloped in a soft, decomposed quartzose gangue if the deposit be ancient, but very hard in recent formations. The product is frequently both auriferous and argentiferous, but the precious metals are never extracted except in the government mines. The principal rock is a porphyritic feldspar in an older clay, sometimes this porphyritic feldspar is replaced by felsite. The veins are frequent in the porphyry and its transformations and continue without interruption into and through the neighboring rock. The veins of the district of Aui are very numerous; either east or west, carrying copper and poor in lead. Second, veins dipping north or south, containing less copper but more lead than the east and west veins. The width of the lead varies from two inches to four feet. The wall is composed of quartz, fragments of clay, pyrites, galena, blende, etc. The production of these mines during the eight months of the last annual report reached 512,832 pounds. The leads running east and west are richer in minerals than those running in any other direction.

The same peculiarity is apparent in the greater part of the mines of Japan. While other nations in locating ledges and veins proceed upon scientific principles, observing the character of the geological formation, the exterior of the mountains, etc., the Japanese go it blind, so to speak. A locality is selected without any regard to formation or condition, and a horizontal gallery is constructed, the entrance to which is sufficiently elevated to provide for dumping. The gallery is continued *ad infinitum*, until an ore vein is found, or the work is stopped by some accidental caving in or geological obstruction, in which case hazard is consulted in constructing another gallery. This gallery is from three to four feet in hight and about 16 inches wide, hardly room enough for a small man to pass. Generally timber is useless, but sometimes lateral timbers are put in. When the gallery has accidentally encountered a vein it is followed *down*, the miners following its inclination by means of single poles, hollowed for foot-rests. The water is kept out of the galleries by means of a series of common suction pumps made of bamboo, and arranged at different hights upon platforms to allow for the elevation. The ore is extracted by means of a hammer weighing about two pounds, and a chisel twelve inches long. The method employed is that of mining by reversed galleries. Explosives are not used, although some of the Japanese miners have used powder, but with disastrous effect upon themselves and so the use is abandoned. The ore is brought out by young children in baskets carrying from 50 to 75 pounds. Each carrier is provided with a small pillow to support the weight upon his head, or too he used as a seat. The mine is lighted by means of shells filled with oil, and containing several wicks of junk. These small primitive lamps are placed in rows along the galleries in holes made for the purpose. The oil used is cocoanut oil.

Ventilation does not exist, in fact the drift does not penetrate very far into the earth before the water overcomes the pumps, when the gallery is abandoned and a new one commenced.

The ore, if decomposed, is broken up in a species of arastra, but when hard, is broken up very small by women and girls, who use a light hammer, breaking the ore against a small-pointed anvil, after which it is hammered to powder, as nearly as may be. The dust is then placed in baskets and washed in running water. Women also do this work, being compelled to stand in cold water, day after day, up to their knees. However, small pots of warm water are kept near by, into which the poor creatures plunge their limbs to warm them. The washed mineral is then transported to be roasted, and layers of wood and mineral are alternately placed one upon the other until a regular pyramidal-shaped structure is built up —and fire applied. After being roasted the mineral is weighed and placed into a furnace with wood, charcoal and mineral. The whole mass is fused, the workmen stirring it up and rejecting the scoriæ with a long bent pike pole. The operation commencing at 4 A. M. is completed about 10 o'clock at which time the fires are covered, and the black, brittle mass removed from the furnace and placed into a second furnace for refusion. In the fused mass of the second furnace, a pail of water is thrown, and the solidified surface removed; then more water, and another cake of metal is removed, and so on until the furnace is emptied. Each furnace has a capacity of about 250 pounds. The metal obtained by the second fusion is called *arado*, it is extremely malleable and used for a great variety of purposes, its composition is variable, but generally contains 80% to 90% pure copper. To obtain *nkagane'* or pure copper the metal is fused a third time, rejecting the scoriæ as before. The government of Japan does not interfere with the exportation of copper, but it prohibits the association of foreigners in the working of the mines, no person, not a Japanese, can have any interest in the mines of the kingdom.

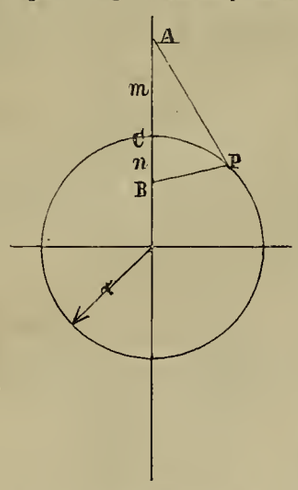
The copper obtained by this imperfect process is of a superior quality and is devoted to an infinite variety of uses, particularly in the manufacture of ornaments. There exists only a trace of antimony and arsenic in Japan copper. The splendid qualities of the copper are due to the excellence of the mineral and not to the primitive mode of extraction, as will be perceived. And in spite of the beautiful ornaments made of it, we have nothing to fear from importation, while Japan has everything to gain in the employ of intelligent scientific labor.

A New Property of Circles.

The following property of circles, which, not having found it mentioned in any work on mathematics, I believe to be new, will be of interest to mathematicians and useful for draughtsmen and surveyors.

Suppose a straight line, $A\ B$, be divided at any point into two sections; and a circle be drawn through C with its center on the continuation of the line, $C\ B$, with a radius equal to the product of these sections divided by their difference. Then this circle has the remarkable property of dividing any two lines drawn from A and B, so any point, P, on the circle, in the same proportion as the point C, divides the line $A\ B$. That is to say, $A\ C : C\ B :: A\ P : P\ B$. This may also be expressed in more general terms, thus: If $A\ C = m$ and $C\ B = n$, and the radius r be made $= \frac{mn}{m-n}$; then $A\ P$ is to $P\ B$ as m is to n.

Draughtsmen will find this law convenient for reducing or enlarging drawings. Suppose we wish to reduce to three-fifths of the original scale. Then $A\ C$ must be made equal to 5 and $C\ B = 3$ parts of equal and convenient size. The radius of the circle is equal to $\frac{5 \times 3}{5-3} = \frac{15}{2} = 7\frac{1}{2}$ parts. Take any length out of the larger drawing between the points of the



dividers, place one of them at A, the other on that point of the circle where it meets it. Keeping this latter point in place on the circle, move the other point of the dividers from A to B, then the length now included in the dividers is exactly three-fifths of the former length. This circular reduction scale does away with the use of a truler or triangle, which must be constantly employed when a right-angled triangle is the basis of reduction.

Surveyors will find in this law an easy method for laying out railroad curves. The point C corresponds to the beginning of the curve. Place the instrument at A; sight at any angle, A; mark the line on the field by two rods sufficiently far apart. The angle at B is calculated easily by the formula:

(Sine of angle B) = (sine of the angle A) (times $\frac{m}{n}$).

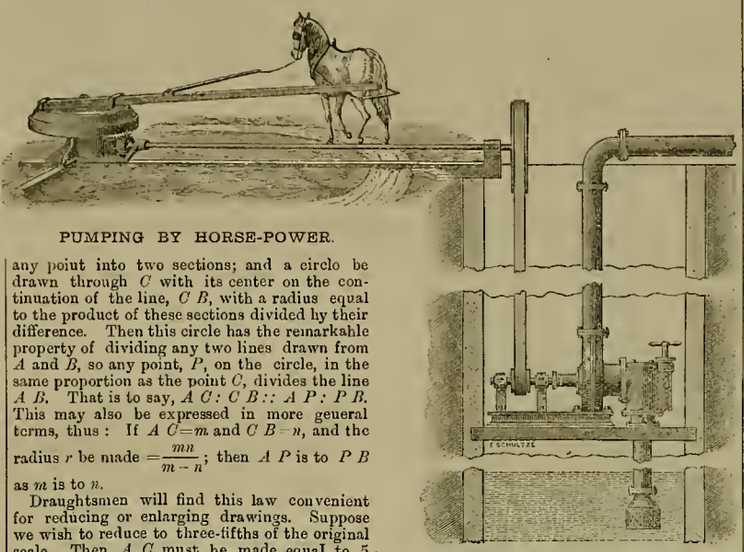
Place the instrument at B and set it at the calculated angle. Send the assistant forward in the line of sight until he is in line with the two rods marking the angle A. Then his position marks a point of the required circle.

L. Heynemann, Civil Engineer.

Water Rights.

The Supreme Court of California at the May term, 1879, decided the following case relating to water rights, viz., Stine Canal Co. *vs.* Kern Island Irrigating Canal Co. In August, 1874, the Kern Island Irrigating Canal Co. appropriated a portion of the waters of Kern river, and conducted the same by means of a canal to the Old South Fork, from which it was taken out lower down the stream, and so continued to do up to about the spring of 1878, when the waters were conveyed through the canals of the defendant, without uniting the same with the Old South Fork. All of the water companies which are joined as plaintiffs, except the Goose Lake Canal Co., appropriated portions of the waters of Kern river prior to the appropriation by the Kern Island Canal Co., and consequently their right to the portions of the water by them respectively appropriated is superior to that of the defendant. The right of the defendant is subordinate to that of the plaintiffs, and it is not entitled to divert the waters of the river to such an extent that a sufficient amount thereof will not flow down the river to supply the plaintiffs with their usual quantity. The injunction granted by the District Court ordered modified in accordance with above ruling.

A question of subterranean water rights was decided in the case of Hale *vs.* McLea. The defendant had diverted the whole body of a subterranean stream used by plaintiff. The point decided in this case was that the defendant could not exercise any greater rights in respect to the diversion or use of the waters of the subterranean stream flowing across his land to the spring of the plaintiff, than if he had been an upper and the plaintiff a lower riparian owner on a surface stream flowing across their respective lands. The defendant can only claim as much water as he needs for his cattle and for domestic purposes, leaving the surplus to flow to the spring of the plaintiff in its natural channel. But the defendant here had exceeded his rights by diverting the whole body of the water from its natural channel.



PUMPING BY HORSE-POWER.

Australian Exhibitions.—Dr. J. I. Bleasdale informs us that the commissioners of the Australian International exhibition will keep all of the departments open for the reception of American exhibits until the 1st of March, and at the termination of the Sydney exhibition will be shipped to Melbourne so as to be in time for the exhibition of 1880, at that port. Dr. Bleasdale has made arrangements with the managers of the S. F. Mechanics' fair for the exhibition of all articles intended for Sydney, so that all exhibits may be sent to the forthcoming Mechanics' fair, at the termination of which they will be shipped direct to Sydney. A great many exhibits have been promised, and the public generally are urged to take advantage of the opportunity presented to make a full and valuable exhibit of American industries. California has an interest in this which needs no demonstration. Dr. B. is unsparing in his efforts to make a perfect display of American manufactures. Communications may be sent to Dr. J. I. Bleasdale, care Sec'y Mechanics' Institute, or the New City Hall, or 120 Sutter street.

Meteorological Summary for June.—The report of the United States Signal Service officer of San Francisco, for the month of June is summarized as follows: The mean hight of barometer for the month was 29.913; mean temperature, 59.4; mean humidity, 70.4; prevailing winds, west; highest barometer, 30.103; lowest, 29.766; highest temperature, 85°; lowest 49°; monthly range, 34°; greatest velocity of wind, 30 miles per hour; total number of miles traveled by wind, 8,038; total rainfall, .05 inches. Rainfall in June during former years: 1872, .04 inches; 1873, .02 inches; 1874, .14 inches; 1875, 1.02 inches; 1876, .04 inches; 1877, .01 inches; 1878, .01 inches.

Centrifugal Pumps for Irrigating and Reclaiming Purposes.

We illustrate herewith a form of the Heald & Cisco Centrifugal pumps for irrigating purposes and reclaiming marsh land, for which these pumps are specially adapted.

In one device which is found extremely convenient for works of irrigation and drainage, the centrifugal pump is mounted on a carriage with two large wheels and long shaft, which are attached to the portable engine, and which steady the pump, and keep the belt tight and firm. The suction pipe of the pump is attached diagonally, so as to enable it to be readily placed in the water. The foot valve is placed at the bottom of the pipe, and can be placed on the carriage when required to be moved from place to place.

The cut shows an arrangement for working centrifugal pumps by animal power, in countries where fuel is expensive, or skilled labor difficult to obtain. This mode of raising water will be found very simple and efficient; the machinery is easily transported, and can be erected without the assistance of skilled labor, besides being very durable, and not liable to get out of order.

There is also an arrangement for pumping with an improved horizontal engine working a centrifugal pump fixed over a well for irrigation or any other purpose. When the water is more than 28 feet from the surface, the pump can be fixed 25 or 30 feet down the well, and the engine fly-wheel arranged to work over it; or a counter shaft fixed in the top of the well, and the engine fixed at some distance from it. These engines will be found less expensive than stationary engines and boilers, as they only require foundation sufficient to sustain their weight, being entirely self-contained. The motors and pumps to which we have alluded are being introduced to our agriculturists by Parke & Lacy, 414 Market street, San Francisco, from whom further information as to price, etc., can be obtained.

The Sutro Tunnel.—The mere fact of the completion of the Sutro tunnel and its successful operation, will not, of course, give the Comstock lode a new lease of life unless ore bodies actually exist in an attainable shape. The fact, however, cannot be overlooked that had it not been for this tunnel the lower levels of the lode would probably have had to be abandoned. Eight hours after the starting of the pumps the water in the long drowned-out mines was lowered 100 feet, and this fact alone demonstrates the practical success of the gigantic undertaking as a means of freeing the mines of water. The labor on the tunnel will not have been expended in vain even if the ore supply should not exceed the amount invested with reasonable interest. To capital and an energy which we would like to characterize as rugged obstinacy on the part of Mr. Sutro, the success of this the greatest tunnel in the world is due. In spite of scientific incredulity and local jealousies, the work went on quietly and resistlessly, and we believe that no one now would feel disposed to have the work undone. The fruits of energy combined with labor show for themselves; failure alone can be attributed to stupidity either on the part of the engineer or the opposing elements in human nature, that must either "rule or ruin." Whether the cost of mining or the reduction of ore will be cheapened, we are not prepared to say. There are many difficulties yet to be overcome; the transportation of ore through four or five miles of tunnel may not lessen the cost, while the old and customary appliances will still be necessary, both for the use of workmen and for hoisting to the level of the tunnel. All things considered, the millions expended must be recovered from the ore, and we fear, though we do not hope, that cheapness will be one of the lost arts on the Comstock. Still, if the tunnel pays for itself, the immense outlay will be justified in the future advantages to accrue in that and other localities, by the solution of so important an engineering problem.

Fire in the Mines.—From Virginia, Nevada, comes news of a fire July 1st, in the old winze of the Imperial mine on the 2100 level. The smoke and gas rushed through the long drift to the Bullion and Exchequer, overwhelming three men, who are still missing. Their names are Donahue, Perry and Cochran. It is not known what fate has befallen them, but probably they have been smothered by the smoke and gas. The drift to the Yellow Jacket new works has been bulkheaded. There were about 75 men in the mines at the time, all but the three above named escaping. The gas was so bad that no man could live in it an instant in the Bullion incline and shaft. As the gas passed toward the Bullion the men were able to bulkhead the drift on the 2000 and on the 2135 levels, south of the burning winze. On the north side the rock is hard, and there are no timbers in the drifts. The fire is therefore confined to the winze, and can do little harm. All was made safe by 9:30 o'clock. Water was sent down into the burning winze by means of an air pipe that runs through it. The fire probably originated from a candle kept near the foot of the old winze, in the drift on the 2135 level.

NOTICE

TO THE

MINING PUBLIC.

MESSRS. RANKIN, BRAYTON & CO., of the Pacific Iron Works, are the only parties authorized to manufacture HOWELL'S IMPROVED WHITE FURNACE under the License of this Company.

THE STETEFELDT FURNACE CO.,

By C. A. STETEFELDT, President.

Referring to the above, the undersigned would call attention to the fact that by a compromise recently effected with the STETEFELDT FURNACE COMPANY, they have secured the use of all the patents of said Company applying to

Revolving Cylinder Furnaces,

And are thus enabled to give purchasers the license of all patent claimants, to-wit:

WHITE, HOWELL, THOMPSON,

— AND THE —

Stetefeldt Furnace Company,

Thereby avoiding all further litigation in reference to these rival claims. The great

SUPERIORITY OF THE FURNACES

Embracing these patents has been satisfactorily demonstrated. There are now some thirty of them in operation in the various mining districts of the coast, operating in all cases with economy and satisfaction, working in many localities

THE BASEST AND MOST REFRACTORY ORES UP TO 90 AND 95 PER CENT.

By an improvement—the patent for which has recently been allowed—this Furnace can be readily adjusted so as to work with equal facility and effectiveness all classes of ores.

The following are some of the Mining Companies who have recently adopted this Furnace, the most of which are now in successful operation, many of them running two and some three and four Furnaces.

NEVADA.—Orand Prize, Star, Martin White, Highbridge, Columbia, Alexander, Paradise Valley, Jefferson, Leopard, Eagle, Endowment, Independence.
ARIZONA.—Tiptop, Tiger, Peck, Hackberry, Corbin, Tombstone, Bradshaw.
OREGON—Monumental.
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RANKIN, BRAYTON & CO.,

Pacific Iron Works.

CAUTION.—All persons are hereby cautioned against buying from other parties Furnaces embracing the improvements covered by the patents above mentioned, as they will be vigorously prosecuted and involved in heavy damages.

WASHING! WASHING!

Prices Reduced! Prices Reduced!

La Grande Laundry,

13th Street, Between Folsom and Howard.

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Office open from 7 A. M. to 9 P. M. Saturdays to 11 P. M.

Washing called for and delivered to any part of the city free of charge.

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PALACE RESTAURANT

218 Sansome St.

This elegant and spacious S. F. Restaurant has been re-opened with superior bill of fare daily, and is now the best and most popular dining saloon on this Coast.

Good Living at Reduced Prices

[Lunch ready at 10 A. M.] Resident business men and visitors from abroad will be wise in giving this place an early call. Examine of fare and prices.

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PACIFIC POWER CO.

Room with steam power to let in the Pacific Power Co.'s new brick building, Stevenson street, near Market. Elevator in building. Apply at the Company's office, 314 California street.

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Favorably known in the East, desirous of settling in California, seeks position as Superintendent or Chief Draughtsman. Competent to design Stationary, Marine, Locomotive, Mill Work, Sugar and Hydraulic Machinery. Speaks Spanish. Unexceptional references. Address EXPERT, this office.

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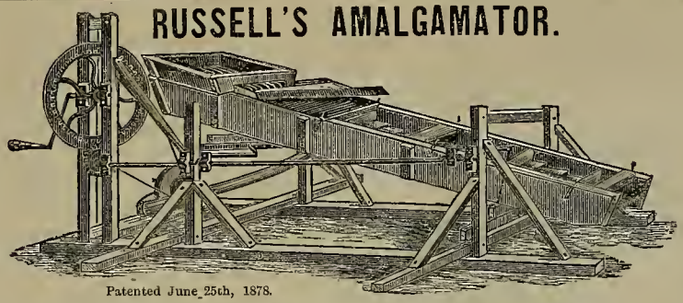

Patented June 25th, 1878.

SAVE YOUR GOLD

And Also SAVE YOUR QUICKSILVER.

The above Washer and Amalgamator with new patent Wire Bridge Quicksilver Boxes attached, can be worked wet or dry, either by hand, steam, horse or water power, and is easily taken apart and packed. For washing Pulp, Earth, Gravel, Mill Tailings or Black Sand, it is without a rival.

Has been Thoroughly Tested and given Complete Satisfaction.

The entire Lining, Hanging Plates, Riffles and Boxes Amalgamated

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Capacity, 30 to 60 tons per day, according to size. For further particulars apply to

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Pioneer Plating Works.

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Silver Plated Amalgamating Plates,

For Quartz Mills and Gravel Claims. Are prepared to furnish any size Plate promptly and satisfaction guaranteed. Old Copper Plates purchased, Plated or the Gold Extracted by the most complete process, at small cost, and the copper saved.

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Consulting Physician,

Professor of Phrenology and Mental Hygiene.

Proprietor of the Smithsonian Medical and Phrenological Institute, 635 California Street, above Kearny.

This Institute, by combining medical hygiene with the various Water Cure treatments and the most powerful Electrized Horseshoe Magnet in the world, claims to cure speedily and permanently all forms of acute or chronic nervo-vital derangements, Brain, Spinal and Heart diseases, St. Vitus Dance, Palsy, Epilepsy and all Rheumatic, Liver and Kidney troubles. The institution has for the past 20 years made a specialty of treating all forms of weaknesses and diseases peculiar to males and females. By the use of hygienic remedies and electro-motopathy the worst forms of impotency and seminal weakness in males and sterility in females are speedily and permanently overcome. Hygienic board, with or without rooms. Terms moderate. Electro-thermal, Russo-Turkish and Medicated Baths given daily.

Mrs. Dr. Smith as Matron has charge of the female bathing department.

DR. SMITH has practiced Phrenology the past 30 years, and during the last 20 years has been constantly using the science connected with Physiognomy, in examining or diagnosing disease in this city, and claims to have made discoveries in the SCIENCE of Phrenology that enables him, by an examination of the head, even blindfolded, to determine the disease to which the person is constitutionally subject, or whether the disease at the time afflicting the person, is the result of accident or hereditary weakness; whether CONSUMPTIVE, DYSPEPTIC, RHEUMATIC, APOPLECTIC, NEURALGIC, LEUCORRHEAL, or SEMINAL. Especially does the form of the head indicate the strength of the uterine, genital or reproductive system. The head is also an index of the natural strength of the lungs, heart, stomach, liver, kidneys, spleen, back or vertebra, and it determines the power of the system in warding off and overcoming disease of all kinds.

Ladies or gentlemen, desirous of obtaining a thorough and correct Phrenological examinations with Fowler and Wells' charts, will meet with a respectful reception at his consulting rooms. Parties can depend upon a reliable delineation of the character of their intimate male or female friends, by presenting a clearly defined photograph.

Phrenological or Physiognomical examinations without charts, $1.50; with charts, from $2 to $3.

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And all persons who are in any way out of health, who desire to know the nature and causes of their disease, may avail themselves of an examination through phrenology in regard to health free of charge, between the hours of 9 A. M. and 8 P. M. Sundays from 9 A. M. to 12 M.

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Take the Paper that stands by your interests.

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Consulting Engineer & Metallurgist,

Examiner of Mines and Assayer,

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Author of— SAN FRANCISCO.

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CHARGES.—ASSAYING, $3; TESTING, $2 per metal.

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All chimneys on which joint hands with cement, or its equivalent, are used to make the joint smoke and fire-proof, with rods, clamps, or their substitutes, to brace the chimneys to the buildings, are INFRINGEMENTS on my patents. My patents for sectional chimneys have been sustained in every instance.

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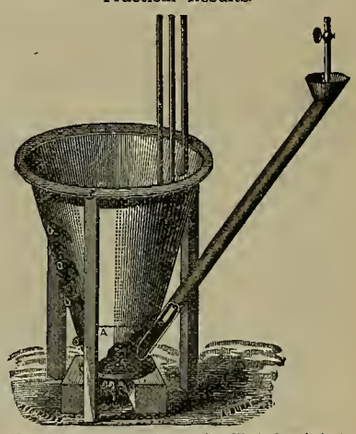

No mechanism required to run it. Worked entirely by pressure of water throwing the ore forcibly on to and through a body of mercury.

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REPORTS MADE ON MINES. Quartz Mills, and Works of every description started.

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The undersigned, owners of LESCHOT'S PATENT for DIAMOND POINTED DRILLS, now brought to the highest state of perfection, are prepared to fill orders for the IMPROVED PROSPECTING AND TUNNELING DRILLS, with or without power, at short notice, and at reduced prices. Abundant testimony furnished of the great economy and successful working of numerous machines in operation in the quartz and gravel mines on this coast. Circulars forwarded, and full information given upon application.

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Ores worked by any process.
Ores sampled.
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We would call the special attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our stock of Clay Crucibles, Muffles, Dry Cups, etc., manufactured by the Patent Plumbago Crucible Co., of London, England, for which we have been made *Sole Agents for the Pacific Coast.* Circulars with prices will be sent upon application.
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Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast.
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Careful attention paid to practical working tests on a large scale of Gold-bearing Quartz and ores of a refractory and sulphureted nature.
Will examine, report on, and survey mining properties.

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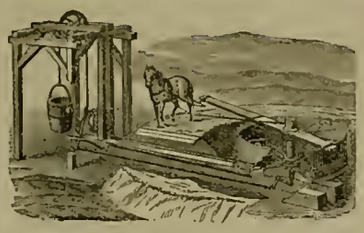
Our DRY AIR COMPRESSORS are the most Economical Compressors in the Market.



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This Power is especially adapted to working mines, hoisting coal or building material, etc. It will do the work of a Steam Engine with one-tenth the expense. One Horse can easily hoist over 1,000 pounds at a depth of 500 feet.

The Power is mainly built of wrought iron, and cannot be affected by exposure. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending bucket. The frame of the Power is bolted to bed-timbers, thus avoiding all frame work. When required these Powers are made in sections for packing.

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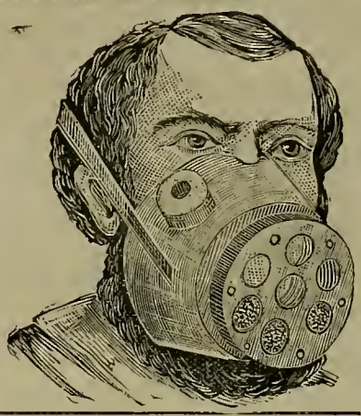
— PATENT —

LIFE-SAVING RESPIRATOR



Prevents Lead Poisoning and Salivation.

INVALUABLE to those engaged in Dry Crushing Quartz Mills, Quicksilver Mines, Guano Works, White Lead Corroding, Feeding Threshing Machines and all occupations where the surrounding atmosphere is filled with dust, obnoxious smells or poisonous vapors. The Respirators are sold subject to approval after trial, and if not satisfactory the price will be refunded. Price $3 each, or $30 per dozen. Sent post-paid to any address upon receipt of price

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Send for Descriptive Circulars containing testimonials of well-known parties who are at present using them.

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COMPLETE THRESHING OUTFITS,

Consisting of HOADLEY'S STRAW-BURNING ENGINE, 15 horse power, JACKSON'S REMODELED PITT THRESHER, with Feeder, Elevator, Derrick, Forks and Water Wagon,

$2,500 to $3,000,

Fully Guaranteed to Equal the Best Improved Outfits in the Market.

Also, one four-sided, six-inch SMITH'S MOLDING MACHINE, and one HOADLEY WOOD-BURNER 12-horse power, at a bargain. Also, new 3½-inch Thimble-Skein Wagons at $75, and 10-foot WINDMILLS at $80.

Machine Work and Castings of all Kinds to Order.

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Highly Important to Miners and Quartz Mill Men!

SILVER PLATED AMALGAMATING PLATES.

The best process yet discovered for saving fine or float gold. Extensively used with great success in gravel and quartz mining in various parts of the Pacific Coast. Over one thousand orders have been filled, and the demand is constantly increasing. Old Mining Plates bought or taken in exchange for new Silver Plated Plates. Gold extracted from old Plates at a moderate cost. Old Plates (which often contain a surplus of gold above the cost of plating) can be re-plated.

With the most extensive facilities on the Pacific Coast, orders can be filled very promptly and satisfaction guaranteed. All kinds of metal goods plated. Send for circular.

SAN FRANCISCO GOLD, SILVER, NICKEL AND COPPER PLATING WORKS,

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In consequence of spurious imitations of

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which are calculated to deceive the Public, Lea and Perrins have adopted A NEW LABEL, bearing their Signature, thus,

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which is placed on every bottle of WORCESTERSHIRE SAUCE, and without which none is genuine.

Ask for LEA & PERRINS' Sauce, and see Name on Wrapper, Label, Bottle and Stopper. Wholesale and for Export by the Proprietors, Worcester; Crosse and Blackwell, London, &c., &c.; and by Grocers and Oilmen throughout the World.

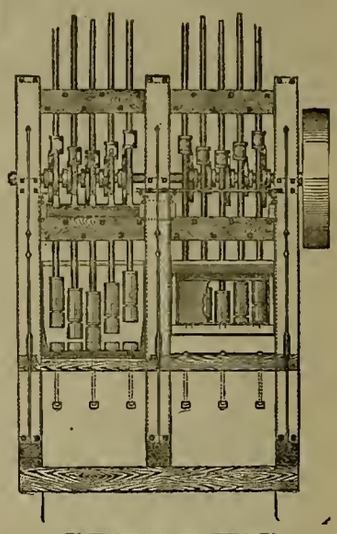
To be obtained of CROSS & CO., San Francisco.

Machinery.

GOLD AND SILVER

Grinding and Amalgamating MACHINERY.

Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver Ores, Chloridizing Furnaces, Retorts, Rock Drills, Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill Supplies.



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Wrought-Iron Frame

FOR STAMP MILLS.

Great saving in time and money over the wood frame. Is made complete with wrought-iron frame ready to put upon the foundation, requiring no skilled millwright. These mills are unsurpassed in excellence in every particular.

We are furnishing all the Machinery for a 10-Stamp Gold Mill, including Crucible, Steel Shoes and Dies, Boiler and Engine, Counter Shafting, Pulleys, etc., Stamps weighing 450 lbs. each, with Copper Plate inside of the Mortars, and for tables outside, making all the Machinery complete for a 10-Stamp Mill for the sum of

$2,250.

We construct Mills with Stamps weighing from 350 to lbs. for gold or Silver Ores. Wet or dry Crushing Mortars. Will contract to erect complete Gold and Silver Mills on most improved plans. We have 30 years' experience in mining and milling Gold and Silver Ores, and can compete the world. Send for a circular. Address

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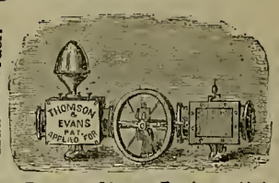
Engineers and Machinists.

Rubber Suction HOSE Made to Order.



All Sizes of Gas and Tube FLANGES.

Steam Pumps, Steam Engines, Hoisting, Pumping, Quartz Mill, Mining, Saw Mill Machinery, Specialties.

Plans and Specifications for Machinery furnished. Repairing promptly attended to.

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THE IMPROVED O'HARRA

CHLORIDIZING FURNACE.

Patented Sept. 10th, 1878.

Now in Operation at the Extra Mining Co.'s Works, Copper City, Shasta Co., Cal.

Two men and two cords of wood roast

Forty Tons of Ore in Twenty-four Hours,

Giving a full chlorination (100%) at a cost of 30 cents per on. Address,

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Furnaceville, Shasta Co., Cal

Or CHAS. W. CRANE, Agent,
Room 10, Safe Deposit Building, San Francisco.

Dewey & Co {202 San-some St.} **Patent Ag'ts**

Continued from page 5.

Gold, 5 ounces; silver, 41 ounces. The Golden King, an extension of the Golden Fleece, produces ore from pay streak 12 inches wide, assaying: Gold, 3 ounces, value, $62.01; silver, 417 ounces, value, $492.00; total, $554.07. At Mineral point the mines are active, with good ore on most of the dumps. In the San Miguel district the Lena, at present working, shows a pay streak of high-grade copper, assaying 800 ounces in silver per ton, with a trace of gold. In the Diamond tunnel the vein is over four ft wide, carrying good ore the entire width. From the Susquehanna 13 tons were sampled and promise a run of at least 250 ounces to the ton. From the Aspen mine 100 tons of ore have been taken that will average 175 ounces in silver per ton. Rich float has been found in Hensen creek, near the "Burro Cabin," indicating the existence of a valuable silver-bearing vein.

ITEMS.—Denver *Tribune*, June 25: A new mining camp has been developed about 15 miles from Canon City, at Oak creek, near the fork of the Rosita and Silver Cliff roads. It is called Crystal City. Fifty claims are now being worked; some of them run considerable galena, but many assay as high as 200 ounces per ton. Slip-up and Hell Gate are the principal. From Silver Cliff comes news of a discovery in Wet Mountain valley of a find in Jayhawker tunnel, on Round mountain. Silver nuggets, assaying $4,337.76 per ton. The Wolf Tone lode is down 36 ft, showing a vein of mineral a foot wide, carrying chlorides—ore assays from 25 to 40 ounces of silver. The Mohawk shaft is down 15 feet, entirely in vein matter, without walls. Ore assays 44 ounces silver.

IDAHO.

ITEMS.—Idaho City *World*, June 24: The Sub Rosa mine has about 200 tons of ore out. The mill was started up yesterday. The mines on the east fork of Salmon are looking well. They are yielding some very high grade ore. A quartz mill is on the road to Challis. There is much snow in the mountains yet, which interferes with prospecting. A rich mine has been discovered near Stanley basin. Several rich mines have been found on the headwaters of Wood and Lost rivers.

ITEMS.—*Statesman*, June 24: Nine bars of bullion, valued at $23,530.40, were shipped from Silver City last week. The prospects at Rocky Bar and Atlanta are flattering. A ten-stamp quartz mill is being erected on Shaw's mountain, near Boise City. News from Bonanza City say that the Custer mine has at least 2,000 tons of ore in sight, which will average $200. The Great Montana mine, at an elevation of 10,000 feet, has a 7-ft vein carrying six ft of ore that will assay $1,000 per ton. The Chas. Dickens mine is the only mine that has attained any depth. It has a shaft 190 ft deep, with plenty of ore in sight, running from $200 to $2,000 per ton. There have been, at the Rising Sun mine, two crushings and clean-ups with an arastra, the first showing a result of nearly $100 per ton, the second, by the Robertson process, satisfactory, but the result not known. Samples from the tailings of the crushing by the Robertson process submitted to a fire assay and not a trace of gold or silver found in them, showing that by this process every particle of the precious metal is saved. This mine is very rich in sulphurets.

MONTANA.

ITEMS.—Butte *Miner*, June 24: A discovery of quartz has been made in Spring gulch, a tributary of Alder. Last week, from a few pans of crevice dirt, between $30 and $40 in "wire" gold were obtained. The specimens of ore brought to town from the mine are literally covered with gold. The bullion shipped by express from Butte for the week ending Monday, June 23d, amounted to 213¾ pounds, valued at $34,144.

GOOD ORE.—*Northwest*, June 20: Several one-horse arastras have been erected for testing the ores at the mouth of Nevada Creek canyon. Yonken & Reeseman's clean-up of six ounces in three days' run is considered a fair average. It is rumored that a rich lead has been discovered at the head of Lincoln gulch, assaying 38 ounces to the ton.

NEW MEXICO.

ITEMS.—Silver City *Herald*, June 21: Mining in the Mimbres is likely to be interfered with by the Apaches. All of the mines are turning out at present very rich ore. Some of the specimens are literally filled with horn silver and other carbonates.

OREGON.

ITEMS.—Jacksonville *Sentinel*, June 25: Squaw Lake mine is looking well and the depth of the bank of pay gravel is increasing. In the Sugar Pine ledge the supply of gold quartz is abundant. In the Steamboat quartz mine active preparations are being made to find the lost vein. A nugget worth $140.50 and another worth $8.25 were picked up near French gulch at the Auburn mines in piping a claim owned by Mr. R. Roberts. The specimens were fine gold.

Bodie Bullion.

The following is a statement of the total amount of bullion shipped from the Bodie and Standard mines since their discovery, viz.:

Standard Bullion.

First bar shipped in April, 1877.

1877.		June	$ 83,667.33
May	$50,984.80	July	104,049.70
June	49,534.43	August	100,510.78
July	55,570.12	September	01,550.19
August	104,704.07	October	70,858.10
September	153,732.77	November	100,507.31
October	128,270.08	December	98,842.75
November	106,299.08	1879.	
December	101,117.17	January	102,167.79
1878.		February	87,700.23
January	80,104.34	March	09,642.39
February	51,040.41	April	102,002.89
March	73,504.29	May	114,951.81
April	78,215.37	June	97,039.30
May	75,540.51		
Total			$2,366,771 12

Bodie Bullion.

First bar shipped July 30th, 1878.

1878.		1879.	
August	$601,168.89	Janu'ry to M'ch 16th	$65,652.44
September	248,530.63	June 16th to June 24th	70,747.18
October	85,575.14		
November	83,226.74		
December	87,335.06		
Total			$1,242,712.58

A total for both of $3,609,483.70. To this amount should be added the bullion shipments of the Bulwer, Noonday, Con. Pacific and one or two other lesser mines, which would increase the total to over $4,000,000 since Bodie was reopened to the mining world in 1877.

BOSS AMALGAMATOR.—Attention is called to the advertisement in another column of the "Elkins Boss Amalgamator," a machine now being introduced to the mining public and which we illustrated and described in detail in a recent issue. The machines weigh 500 pounds and are useful for amalgamating mill pulp, tailings, sands, etc. They are sold for $250 each.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

CONSTRUCTION FOR WHEELS.—L. B. Laurence, Monticello, Napa Co. Dated June 10th. This improvement in the construction of wheels consists more especially in a novel construction of the hub of the wheel, and in the employment of a compressed rubber or other elastic holder or socket for the spokes, in combination with a stationary and a movable flange, one being secured to and forming a part of the hub or axle-box, while the other moves upon a screw-thread upon the inner end of said box, and may be set up against the elastic spoke socket disc so that the spokes will be firmly held in place. The invention further consists in the employment of an expanding ring, which is fitted to the exterior of the axle box, so that it may be forced beneath or within the elastic spoke-holder, and when the flanges are screwed up the expander will force the spokes outward, so as to tighten the tire when loose. In wet weather, or when the tire is re-set, the expander can be removed, and the wheel will be prevented from becoming warped by the contraction. Slight impressions in each of the flanges receive the sides of the spoke tenons, which may also be protected by their elastic side washers. The expanding ring may also be steadied by extending it beneath the stationary flange.

BORING IMPLEMENT.—William Heyn, S. F. Dated May 27th. This invention relates to certain improvements in implements for boring; and it consists in a novel construction of a circular cutter, the lower or boring end of which is in shape and form like that of the usual double twisted augers, having a dovetailed or other suitably formed slot, locking or centering device across its diameter, and also two grooves running at right angles from the above-mentioned slot towards a gimlet-pointed screw in the lower or boring end through which the shavings are being discharged towards the operator while boring. In combination with this the inventor employs either a plain and smooth or a partly twisted stem or shank, having a beveled or other suitably formed projection or locking device, which fits those of the circular cutter in such a manner as to unite the two principal and vital parts into one solid whole, thus forming a veritable borer.

DIRECT-ACTING HORSE POWER.—L. Herbert and Wm. V. Henry, Hicksville, Sacramento Co. The improvement consists in mounting on a horizontal bar moving in anti-friction devices between suitable guides, two pulleys which alternately pass in and out of depressions or corrugations formed on the periphery of a horizontal driving wheel, as the wheel is rotated. A rectilinear motion being thus imparted to the driving bar, and power being directly transmitted to a knee lever operating the pitman of a pump or similar device, without the intervention of any gearing.

COUPLING FOR VEHICLES.—John A. Bilz, Pleasanton, Alameda Co. Dated June 17th. This improved coupling for vehicles consists in a novel construction of the circle upon which the forward axis and holster turn to give direction to the vehicle. This circle is cast or formed in one piece, with the extensions which are fastened to the vehicle. It is constructed with a novel king bolt connection which cannot be broken or uncoupled, and it is braced and steadied so that the bolster cannot be tipped over. Elastic cushions relieve wear and prevent rattle and noise. It also consists in certain other details of construction.

CALIFORNIA GOLD MINES.—Hardly one-tenth of the gold quartz ledges of California which are known to exist are worked. Not one-fifth of the gold-bearing gravel deposits of California are worked. Yet the statistics show that many of these deposits which have been worked have yielded more than $100,000 to the acre. It is a notable fact that very few of the mining interests of California figure on the stock boards. The great mines of Grass Valley are never called. Great mines which have cost millions to develop and the dividends of which are now swelling over a million in the aggregate are not in the stock lists. Once a year something is heard of these mines in the annual reports, and of others nothing is heard because they are not incorporated. It is well to bear these facts in mind. The deposits of precious metals in the somewhat indefinite territory designated as the Pacific coast, have only been here and there explored. The pioneer can no longer take out his ounce in an hour with an old knife and a pan. It requires capital now to open either a gravel or a quartz mine. There are millions of dollars employed in these developments of which we hear nothing, and probably never shall, unless some new quartz district, like the Bodie or Lake, is discovered. Men who are taking gold out of placer mines at the rate of $100,000 an acre seek no publicity. They pocket the net gains, and at a later day, perhaps, the public find out how A and B are able to put up large blocks of buildings in some of the principal streets of the city.—*Bulletin.*

"STOCKTON INDUSTRIES."—An article will appear in the next issue of the MINING AND SCIENTIFIC PRESS upon this subject.

The Geological Section.

At the last three meetings of this section of the California Academy of Sciences, the following items of interest were presented by the members:

Mr. F. Gutzkow presented an account of some experiments which he had in hand as to the production of a valuable commercial article of plaster of Paris from the waste sulphate of lime from the chemical works. He exhibited some samples of this improved plaster, and some castings which were made from it. They differ essentially from casts made from the common article, in being translucent, thoroughly crystalline and much harder, so that they cannot be scratched by the finger-nail. They resemble very much in appearance the natural alabaster. Their most valuable quality is, however, that they are impervious to moisture. The plaster seems to be an hydraulic modification of gypsum. Further results are promised when they are obtained.

Mr. Gutzkow also presented the results of some experiments undertaken with a view to the cheap and easy refining of base bullion. The process has for its object the separation of the silver, copper and gold of the alloy. Ferric sulphate is the solvent used. As is well known, this salt has the property of dissolving copper and silver. The ferric sulphate is prepared in the following manner: Copperas, niter and free sulphuric acid in quantities nearly equal to their proper chemical equivalents are heated together in an iron pot, below 100° C. (212° F.) until the red fumes of hyponitric acid are driven off. With the bath thus prepared, the base bullion is digested at a gentle heat, the copper and silver dissolve, while the gold remains as a residue. From the solution of copper and silver sulphates so formed, the silver is thrown down by means of copper. The silver so precipitated is usually contaminated with small amounts of basic salts of iron, but is otherwise pure. The silver from bullion 600 fine came out 930 to 940 fine. Sometimes results as high as 990 were obtained.

Mr. Amos Bowman described the system of mining at present in use at the gold bluffs of the California and Oregon coast. The richest sand is found in a reef of a depth of six to eight feet, which is formed by the surf at some distance from the bluffs, and seperated from them by a lagoon of still water. Upon this lagoon lighters are floated which remove the sand from the reef to the depth of six or eight feet by an endless bucket pump. The sand is then run through a system of sluices and amalgamated by means of amalgamated copper plates with the use of sodium amalgam. All the fine gold is said to be saved, and the sand to be worked at an expense of 25 to 50 cents per ton.

Prof. Jos. Le Conte brought up some interesting questions as to the formation of gay lussite (double carbonate of sodium and calcium), in many of our lakes, as Mono lake, in whose waters no lime salts are found. According to Clarence King, this is due to the action of the alkaline carbonates, in which these waters abound, upon the lime salts of the incoming streams, leading to its instantaneous precipitation. Prof. Le Conte desired that anyone who could would send to him specimens of the waters and deposits of any of these lakes so that he might investigate this matter. Anything addressed to the "Museum of the University of California, Berkeley," will be sent by Wells, Fargo & Co. free of charge. The water should be sent in clean bottles carefully sealed.

An interesting discussion upon the origin of gold quartz veins, and upon the cause of the variable fineness of placer gold then followed, in which all participated, Prof. Price presenting the results of years of observation and careful assays upon the latter question, and Mr. S. B. Christy presenting the results of some experiments bearing upon the former question. Further investigations were promised by both these gentlemen.

Messrs. C. A. Stetefeldt and Ross E. Browne were elected to membership.

ODD FELLOWS' LIBRARY ASSOCIATION.—We are pleased to note the increase of the above library. It appears from the 24th annual report for 1878-9 that 1,665 volumes have been purchased during the past year, and 90 volumes donated. The reading room is well supplied not only with Pacific coast journals, but with all the leading American, English and German newspapers and periodicals. The total number of volumes in the library is 33,500. The circulation for the year was 107,512 volumes, an excess of last year by 3,502 volumes. From the statistics it appears that 86,427 novels were drawn out to 356 theological and 2,814 scientific works, a result which appears in the published statistics of every library. The cabinet connected with the library contains many valuable and interesting articles. George A. Carnes is the librarian, and to him we are indebted for a copy of the neat report.

REMOVING SCALE FROM BOILERS.—If the boiler is not a very small one, add once a week, about one pound of soda (sodium carbonate) for every 50 gallons of the boiler's contents, taking care to blow out (through the bottom blow-out tap) this charge with the accumulated sludge before adding more, and meanwhile do not let the water run low in the boiler.

News in Brief.

NIHILISM in Russia is notbing.

ANARCHY prevails in southern Epirus.

FROSTS are doing damage in Lassen county.

WATERMELONS are now a staple in San Diego.

MOLLIE MCCARTY won the 2¼-mile race at Chicago in 4:02.

THE Prince Imperial was deserted by English troops in Zululand.

ANTI-LANDLORD agitation in the west of Ireland is becoming serious.

THE Khedive of Egypt no longer reigns. He has abdicated—gone to Naples.

IN Dakota and northwestern Iowa, the grasshoppers are again ravaging.

IN the Bank of France the past week specie increased 19,270,000 francs.

THE potato blight is troubling the river bottoms of Washington Territory.

REDEEMING subsidiary silver coin with standard dollars does not work well.

THE northern Indians, having been whipped, are now willing to go upon their reservations.

SAN BUENAVENTURA has now two oil refineries in operation, and another one building.

A BAD harvest is expected in England. Prices are increasing and American wheat in demand.

AN Eastern paper writes an editorial begging the President not to veto the adjournment of Congress.

AT Liverpool, 30th ult., wheat was quoted at 8s 4d@9s 2d for average California white, and 9s 1d@9s 5d for club.

BISMARCK has been openly snubbed by the Empress of Prussia for declining to recognize the divine right of kings.

CONGRESS has adjourned without making any provision for United States Marshals. How does Congress expect them to live?

NITRO-GLYCERINE works at North Adams, Mass., exploded recently—distributing two men and the adjacent buildings.

THE Mayor of San Francisco refuses to sign the new tax levy because it is 17 cents more than he thinks it ought to be.

THE receipts of the Sunday School picnic last Thursday, amounted to $374.65. Net proceeds $321.85 distributed among Relief Societies.

THE time for receiving applications for space at the International exhibition at Melbourne has been extended to October 31st, 1879.

THE French journals claim that the Darien canal will be absolutely neutral territory. Absolutism does not accord with American ideas.

IN San Francisco half dollars are quoted at 99 buying, 99¼ selling; trade dollars, 98 buying, 98 selling; Mexican dollars, 93 buying, 93 selling.

IT is said that since the prevalence of cyclones in Missouri, and their regular appearance, the farmers are driving posts into the ground to hang to when they come.

THE corporations of San Francisco during the month of June last, disbursed in dividends the sum of $955,666, a falling off over the same month in 1878 of $1,245,042.

About 2,000 people attended the meetings of the Monterey Sunday School Convention June 29th. Every portion of the State except southern California is well represented.

AT Oakland last Saturday, the quiet but forcibly expressed indignation of citizens, procured the withdrawal of 300 Chinamen from works on Long wharf. There was no open demonstration.

THE Sutro tunnel is now an accomplished fact. Pumping commenced June 30th, and in eight hours the water in the drowned out mines was lowered 100 feet. The temperature of the water at the mouth of the tunnel was 118°.

THE Catholic Church has 64 cardinals—32 Italians, 10 Frenchmen, 4 Spaniards, 4 Austrians, 3 Hungarians, 3 Englishmen, 2 Portuguese, 1 American, 1 Belgian, 1 Pole, 1 Bavarian, 1 Corsican and 1 German.

CREMATION having been pronounced a measure of "salutary progress" by the committee of the Paris Municipal Council appointed to consider the question, is about to be introduced into Pere La Chaise Cemetery. It has been decided to set up an apparatus on Siemens' principle, and a Columbarium.

A GIRL 17 years of age, at Boudon, Ontario, is said to be a perfect electric battery. Very few can shake hands with her. By joining hands she can send a sharp shock through 15 or 20 people. Her magnetic attraction is so great that she cannot let go of any article of steel she has picked up. A paper of needles will hang suspended from her finger.

THE Congregational Association, which has been in session at Seattle for a week, adjourned Saturday evening, to hold the next annual session at Fidalgo. The Association endorsed the Massachusetts Civil Damage law, and will seek like legislation in this Territory. The ministers in the Association were requested to preach at least one sermon in the year on the observance of the Sabbath.

BERKELEY PROPERTY.—Many people find Berkeley property desirable for residence, both for the inherent beauty of the location, its nearness and accessibility to the city and its educational advantages. Many move to Berkeley that their sons and daughters may live at home while pursuing their courses at the State University, and some have secured lots and built cottages in which the young people keep house for themselves. Those who may think of Berkeley for a home or for investment will be interested in the advertisement of Mr. Penwell in another column.

Butts' Fruit, Vegetable and Hop Drier.

The enormous and continually increasing demand for canned and dried California fruits, and the production of available quantities, has aroused the inventive faculties in the direction of economical and perfect processes for supplying the market. Mr. Wm. Butts, southeast corner Spear and Mission streets, S. F., is the patentee of a fruit, vegetable and hop drier, which seems worthy the attention of manufacturers and farmers. The Butts drier is built in sections, each of which is complete in itself and of a capacity of 1,500 to 2,000 pounds per day, all the sections are precisely the same cut of lumber, and to any person desiring a large drier, several sections are placed together. Put together with screws, the apparatus is so arranged as to be easily taken apart and transported to any distance in a portable shape.

The fruit is placed in the drier upon a series of trays, and the drying heat conveyed to the whole interior or to any particular tray by simple valves or dampers regulated at pleasure from the outside by means of a uniform key. By means of these valves, easily regulated, the fruit, when ready for packing, need not be removed from the drier, but may remain for any length of time, without deterioration, until necessary to be removed to give room for a fresh supply, the drying heat being shut off. This feature, it is claimed, is different from other driers, and the inconveniences of over-drying, etc., entirely avoided; saving the labor of handling movable trays and economy in the fruit by securing uniformity of appearance and quality. The fruit does not require any manipulation by acids, etc., before, or any sorting after drying, it is put into the drier in its natural state, preserves its color without oxidation, and comes from the drier speedily, ready for immediate packing, shipment or storage. The apparatus is self-ventilating, and all the moist air arising from the fruit is carried off immediately and perfectly. It is also claimed that 160° of heat in this process will accomplish the same results as 300° in others, and with better results, brought about by a peculiar arrangement of side drafts all under control from the outside.

In the drying of hops this process is peculiarly valuable, as it has practically succeeded in the difficult task of drying hops without destroying their qualities by over-drying or inducing incipient fermentation by imperfect drying. The hop drier now being successfully used by Orrin Howell at Hopland, Mendocino county, is said to be a visible proof of the claims of the inventor.

Another feature of Mr. Butts' apparatus is a fruit "canner." In the canner, the fruit is put into the cans raw and sealed, then placed in trays, carrying say 150 pounds each, easily handled, and cooked. It would seem practicable for all of our fruit raisers to utilize their surplus fruits either by drying or canning, thus making them more marketable and command a better price than in a crude state. Several farmers could combine in the matter, and as fruit drying and canning is no longer an experiment but, when wisely managed, an actual profitable investment, there could not be any danger of failure to realize pecuniary benefits. Specimens of fruits, vegetables, meats, fish, etc., dried by this process can be seen by calling upon Mr. Butts, and their appearance and quality would seem to justify his claims.

EVERY new subscriber who does not receive the paper, and every old subscriber not credited on the label, within two weeks after paying for this paper, should write personally to the publishers without delay, to secure proper credit. This is necessary to protect ourselves and subscribers against the acts and mistakes of others.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

HOW TO STOP THIS PAPER.—It is not a herculean task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

SETTLERS and others wishing good farming lands for sure crops, are referred to Mr. Edward Frisbie, of Anderson, Shasta County, Cal., who has some 15,000 acres for sale in the Upper Sacramento valley. His advertisement appears from time to time in this paper.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

EXTRA COPIES can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

PRINTER'S PROOF PRESS, complete and in good working order, for sale at this office, at the low price of $30. Call and see it.

EXPERIMENTAL MACHINERY, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. See ad. F. W. FULLER, 415 Market St., second floor, S. F.

Chew JACKSON'S BEST Sweet Navy Tobacco

GENERAL MERCHANDISE.

[WHOLESALE.]

TUESDAY M., July 1, 1879

Item	Price
CANDLES.	
Crystal Wax	17 @—
Eagle	12 @—
Patent Sperm	30 @—
CANNED GOODS.	
Assorted Pie Fruits, 2½ lb cans	2 00 @ —
Table do	3 00 @ —
Jams and Jellies	3 50 @ —
Pickles, hf gal	3 15 @ —
Sardines, qr box	1 67½ @1 90
Hf Boxes	2 50 @2 75
Preserved Beef, 2 lb, doz	4 00 @ —
do Beef, 4 lb, doz	6 50 @ —
Preserved Mutton, 2 lb, doz	4 60 @ —
Beef Tongue	6 50 @ —
Preserved Ham, 2 lb, doz	6 50 @ —
Deviled Ham, 1 lb, doz	5 50 @ —
do Ham, ½ lb doz	3 00 @ —
COAL—Jobbing.	
Australian, ton	8 00 @— —
Coos Bay	6 50 @ 7 00
Bellingham Bay	6 50 @— —
Seattle	6 00 @ 6 50
Cumberland	14 00 @— —
Mt Diablo	4 75 @ 6 00
Lehigh	13 50 @— —
Liverpool	7 50 @ 8 00
West Hartley	10 50 @— —
Scotch	10 50 @— —
Scranton	11 50 @— —
Vancouver Id	7 00 @— —
Charcoal, sack	75 @— —
Coke, bbl	60 @— —
COFFEE.	
Sandwich Id, lb.	— @— —
Costa Rica	15 @ 16
Guatemala	15 @ 16
Java	23 @— 26
Manila	17 @— —
Ground, in cs	25 @— —
FISH.	
Sac'to Dry Cod	4½ @ 5½
do in cases	5 @ 6
Eastern Cod	— — @— —
Salmon, bbls	8 00 @ 9 00
Hf bbls	5 00 @ 5 50
1 lb cans	1 40 @ 1 45
Pkld Cod, bbls	22 00 @— —
Hf bbls	11 00 @— —
Mackerel, No. 1, Hf Bbls	9 50 @10 50
In Kits	1 85 @ 2 10
Ex Mess	3 25 @— —
Pkld Herring, bx	3 00 @ 3 50
Boston Smkd H'g	70 @— —
LIME, Etc.	
Plaster, Golden Gate Mills	3 00 @ 3 25
Land Plaster, tn	10 00 @12 50
Lime, Sta Cruz, bbl	1 25 @ 1 50
Cement, Rosendale	2 00 @ 2 25
Portland	4 00 @— —
NAILS.	
Assted sizes, keg	2 90 @ 3 00
OILS.	
Pacific Glue Co's Neatsfoot, No 1	1 00 @ 90
Castor, No 1	1 10 @ —
do, No. 2	1 05 @ —
Baker's A A	1 25 @1 30
Olive, Plagniol	5 25 @5 75
Possel	4 75 @5 25
Palm, lb	9 @ —
Linseed, Raw, bbl.	72 @ —
Boiled	75 @ —
Cocoanut	55 @ —
China nut, cs	70 @ 72½
Sperm	1 40 @ —
Coast Whales	40 @ —
Polar	45 @ —
Lard	90 @1 00
Oleophine	22 @ 22½
Devoe's Brill't	22 @ 23½
Photolite	— @ —
Nonpariel	31 @ 32½
Eureka	18 @ 42½
Barrel kerosene	20 @ —
Downer Ker	37½ @ —
Elaine	37½ @ —
PAINTS.	
Pure White Lead.	8 @ 8½
Whiting	1¾ @ —
Putty	4 @ 5
Chalk	1¼ @ —
Paris White	2½ @ —
Ochre	3½ @ —
Venetian Red	3½ @ —
Averill Mixed Paint, gal, White & tints	2 00 @2 40
Green, Blue & Ch Yellow	3 00 @3 50
Light Red	3 00 @3 50
Metallic Roof	1 30 @1 60
RICE.	
China, Mixed, lb	5 @ 5½
Hawaiian	7 @ 7½
SALT.	
Cal. Bay, ton	15 00 @22 50
Common	10 00 @12 00
Carmen Id	12 00 @14 00
Liverpool fine	19 00 @— —
SOAP.	
Castile, lb	10 @ 10½
Common brands	4½ @ 6
Fancy brands	7 @ 8
SPICES.	
Cloves, lb	45 @ 50
Cassia	22½ @ 25
Nutmegs	85 @ 90
Pepper Grain	15 @ 17
Pimento	15 @ 16
Mustard, Cal., ½ lb glass	1 50 @ —
SUGAR, ETC.	
Cal. Cube, lb	11½ @ —
Powdered	11½ @ —
Fine crushed	11½ @ —
Granulated	11 @ —
Golden C	9½ @ —
Cal. Syrup, kgs	70 @ —
Hawaiian Mol'sses	26 @ 30
TEA.	
Young Hyson, Moyune, etc	27 @ 30
Country pckd Gunpowder & Imperial	50 @ 60
Hyson	30 @ 35
Fooo-Chow O	35 @ —
Japan, 1st quality	40 @ —
2d quality	20 @ 25

METALS.

[WHOLESALE.

TUESDAY M., July 1, 1879.

Item	Price
IRON.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2¾ @ 3½
Horse Shoes, keg	5 00 @— —
Nail Rod	— @ 7
Norway, according to thickness	6½ @ 7
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @
TIN PLATES.—	
10x14 I C Charcoal	8½ @ 9
10x14 I C Coke	7 @ 7½
Banca Tin	18 @— 20
Australian	15½ @ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb. less than cask	9½ @— 10
NAILS.—	
Assorted sizes	2 90 @3 00

LEATHER.

[WHOLESALE.]

TUESDAY, M., July 1, 1879.

Item	Price
Sole Leather, heavy, lb	22 @ 29
Light	20 @ 24
Jodot, 8 Kil., doz	48 00 @50 60
11 to 13 Kil	65 00 @76 00
14 to 19 Kil	80 00 @90 00
Second Choice, 11 to 16 Kil	55 00 @70 00
Cornellian, 12 to 16 Kil	57 00 @67 00
Females, 12 to 13 Kil	63 00 @67 00
14 to 16 Kil	71 00 @76 00
Simon Ullmo, Females, 12 to 13 Kil	58 00 @62 50
14 to 15 Kil	66 00 @70 00
16 to 17 Kil	72 00 @74 00
Simon, 18 Kil	61 00 @63 00
20 Kil	65 00 @67 00
24 Kil	72 00 @74 00
Robert Calf, 7 and 9 Kil	35 00 @40 00
Kips, French, lb	1 00 @ 1 35
Cal. doz	40 00 @60 00
French Sheep, all colors	8 00 @15 00
Eastern Calf for Backs, lb	1 00 @ 1 25
Sheep Roans for Topping, all colors, doz	9 00 @13 00
For Linings	5 50 @10 50
al. Russet Sheep Linings	1 75 @ 4 50
oot L egs, French Calf, pair	4 00 @— —
BGood French Calf	4 00 @ 4 75
Best Jodot Calf	5 00 @ 5 25
Leather, Harness, lb	15 @ 38
Fair Bridle, doz	48 10 @72 00
Skirting, lb	33 @ 37
Welt, doz	30 00 @50 00
Buff, ft	38 @ 21
Wax Side	07 @ 80

LUMBER.

TUESDAY M., July 1, 1879.

CARGO PRICES OF REDWOOD.

Item	Price
Rough, M	13 00
Refuse	9 00
Clear	23 00
Clear Refuse	13 00
Rustic	23 50
Refuse	18 00
Surfaced	20 00
Refuse	14 00
Flooring	20 00
Refuse	12 00
Beaded Flooring	23 00
Refuse	13 00
Half-inch Siding	16 00
Refuse	14 00
Half-inch Surfaced	20 00
Refuse	14 00
Half-inch Battens	16 00
Pickets, Rough	11 00
Rough, Pointed	12 50
Fancy, Pointed	18 00
Shingles	1 75

PUGET SOUND PINE RETAIL PRICE.

Item	Price
Rough, M	18 00
Fencing	18 00
Flooring and Step	28 00
Narrow	30 00
2d quality	25 00
Laths	3 50
Furring, lineal ft	

REDWOOD. RETAIL PRICE.

Item	Price
Rough, M	18 00
Refuse	14 00
Pickets, Rough	15 00
Pointed	16 00
Fancy	22 50
Siding	20 50
Surfaced & Long Beaded	30 00
Flooring	30 00
Refuse	22 50
Half-inch Surfaced	30 00
Rustic, No. 1	30 00
Battens, lineal ft	
Shingles M	2 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, July 1, 3 P. M.

SILVER 37½@12½.

GOLD BARS, 890@910. SILVER BARS, 8@19 ₩ cent. discount.

EXCHANGE on New York, 20, on London bankers, 49½@49¾. Commercial, 50; Paris, five francs ₩ dollar; Mexican dollars, 92@95½

LONDON Consols, 97 7-16; Bonds (4,) 104½

QUICKSILVER in S. F., by the Cask, ₩ lb, 33½c

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending July 1, 1879.

	June 25	June 26	June 27	June 28	June 29	June 30	July 1
HIGHEST AND LOWEST BAROMETER.							
	29.880	29.932	29.952	29.851	29.893	29.933	29.952
	29.825	29.877	29.875	29.766	29.788	29.903	29.902
MAXIMUM AND MINIMUM THERMOMETER.							
	62	62	61	60	60	61	61
	52	49	52	51	52	52	52.5
MEAN DAILY HUMIDITY.							
	83.7	85.3	86.3	82.3	76	80	78
PREVAILING WIND.							
	W	W	W	W	SW	SW	SW
WIND—MILES TRAVELED.							
	227	578	803	230	582	879	301
STATE OF WEATHER.							
	Fair	Fair.	Foggy	Foggy	Cloudy	Fair.	Fair.
RAINFALL IN TWENTY-FOUR HOURS.							

Total rain during the season, from July 1, 1878, —— in.

DEWEY & CO'S

SCIENTIFIC PRESS

Patent Agency.

THE MINING AND SCIENTIFIC PRESS PATENT AGENCY was established in 1860—the first west of the Rocky Mountains. It has kept step with the rapid march of mechanical improvements. The records in its archives, its constantly increasing library, the accumulation of information of special importance to our home inventors, and the experience of its proprietors in an extensive and long continued personal practice in patent business, affords them combined advantages greater than any other agents can possibly offer to Pacific Coast inventors. Circulars of advice, free.

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Any stock upon which this assessment shall remain unpaid on the 21st day of July, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 11th day of August, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

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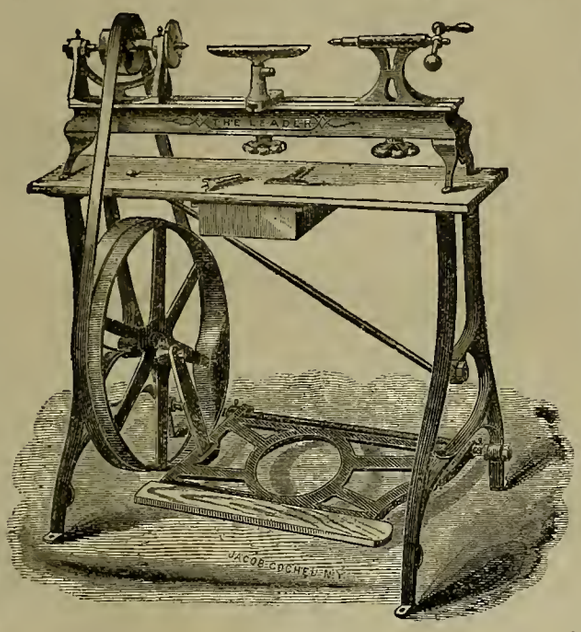

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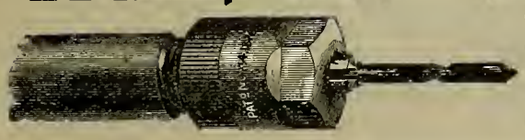

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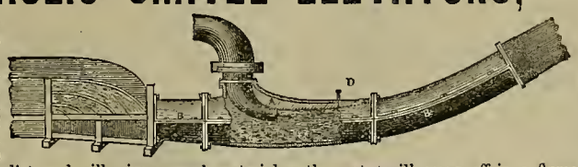

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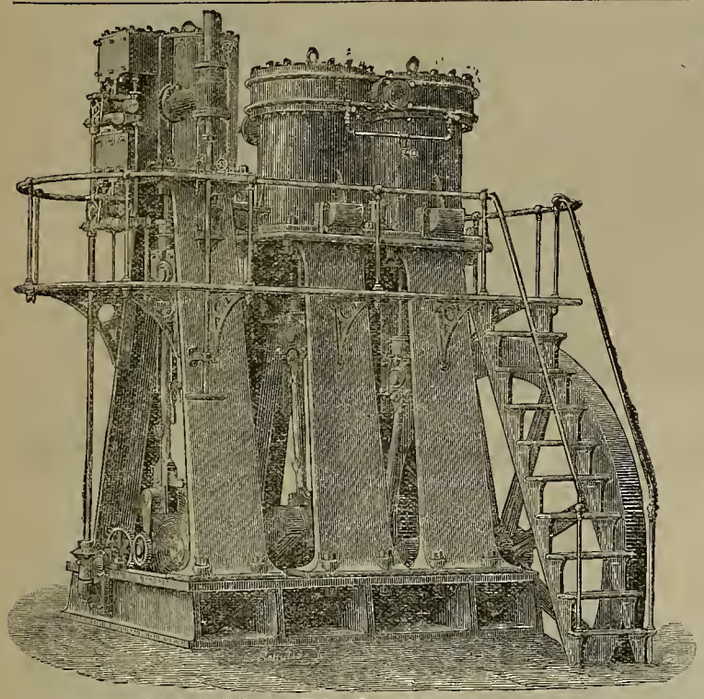

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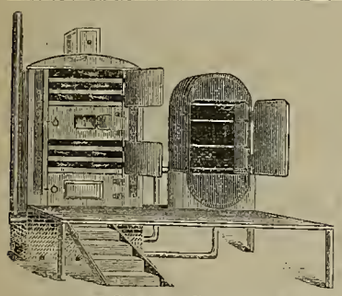

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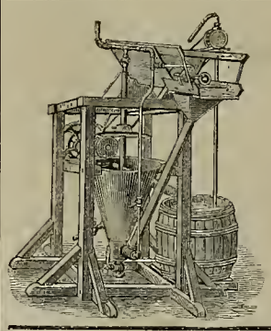

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, JULY 12, 1879. VOLUME XXXIX Number 2.

Tucson, Arizona.

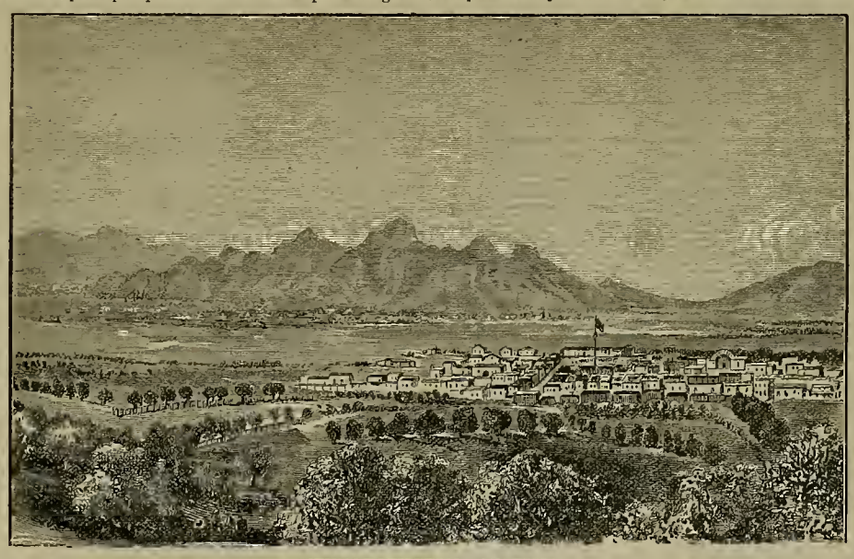
We learn from "Hinton's Handbook to Arizona" and other sources, that the early origin of Tucson is obscure. It is claimed that the valley was settled about the year 1560, which would make it the oldest city in the United States except Santa Fe, which was settled in 1555. Three miles below Tucson, and one mile east of the mission of San Augustin are the ruins of an old town, but no clew can be obtained as to its origin, history, or the dats and circumstances of its destruction.

The lands near Tucson are very rich and were once extensively cultivated, but the Apaches compelled the people to abandon their ranches and seek safety within the town.

The climate is one of considerable range; frequent frosts at night in winter, succeeded by weather comfortably warm during the day. The summers are quite hot, with a sufficient fall of temperature at night to make comfortable sleeping. The spring and fall are quite variable. A little stream flows past the town, the water from which keeps the valley perennially green.

How like a *fata morgana* it looks when you first see it in this enchanted atmosphere: the intensely blue sky overhead, the plain above it covered with sparse grass and fantastic cactus, that hide the sand and make the earth look verdant; the low, white dome and the picturesque buildings clustering about it; the adobe garden walls, with arched gateways, sometimes whitened, sometimes left in their native mud color, toned down by age and the glare of the sun; a tall mesquit tree, or a group of cottonwoods striving heavenward from among the adobe houses; Saddle mountain, with its ever changing tints and its strong lights and shades in the far distance, and Sugar-loaf or Sentinel hill to the immediate left. On the plain between town and the Sugar-loaf, the ruins of what in any other country I should pronounce to have been a monastery, lift themselves from the fresh dewy green—venerable, gray and stately—some wild vine creeping stealthily in at the frameless window, and out again at the roofless top.

Tucson is seen to be located about two-thirds of the way southeast, on a huge plain or plateau, which presents many very striking features. The wonderful effects of the clear and rarified atmosphere are seen here at their best. The great plain or plateau in which just above this place the Santa Cruz sinks for many miles, to enter by a subterranean channel the Gila river, near Maricopa Wells, is certainly over 100 miles in its greatest length and not less than 50 at its widest, which, from the trend of the encircling mountain ranges, is in this vicinity. Looking north and west the eye rests upon the deep blue faint outlines of ranges at a distance of at least 75 miles. Nearer and in the wonderful foreshortening, which is one of the most charming effects seen here, to the east and west may be seen the bold cones of the Picacho and Desert peaks. They stand out in the translucent sky and the luminous sunrise or sunset, with their wonderful combination of colors, so vivid and startling as to defy even the brush of Turner himself, as if one might walk over to them between breakfast and the gray glooming which indicates that the night has passed. Nearer and closer, until their serrated summits seem about to bow down to us, on the east, trending from the northwest to the southeast, is a bold and remarkably well-defined mountain range known as the Santa Catalina, which sweeps in a bold semi-circle, framing the Santa Cruz valley in a massive way. The range lowers and a pass opens just to the east of Tucson. The continuing portion of the range is sometimes called the Rincon mountains. It looks wonderfully and fascinatingly beautiful—the deep shadows and purple tones in which the sunset clothed its sides, while the mirage, which accompanies sunrise and sunset in this latitude, and plays such "fantastic tricks" to startle our vision with, gave to the summit lines and peak tops new and shifting images and forms. It is difficult to realize as one looks at the landscape here, that some of the green fields in which Tucson is set like a dark pebble in an emerald border have been under continuous cultivation for over 150 years. Contemporaneously the Pilgrims landed at Plymouth Rock, and that other fateful cargo had been placed on the banks of the James river, in Virginia; the Spanish conquerors of Mexico had established a presidio at this point, and the Jesuit Fathers had raised the symbol of Christianity, and erected houses of worship amid savage tribes and in the very heart of a wilderness. The town of Tucson then became the presidio of Tulquson. North of this point there was no settlement or mission, nor west of it either, the Puerta de San Diego being the nearest in that direction. Tucson was then, as now, the principal place in the Territory. It still stands as the representative of the old semi-Spanish-Indian civilization; for the Mexicans comprise two-thirds of the resident population, and "the Church" occupies, with its offices, the place of honor customarily assigned to it in the laying out of a Spanish-American town—the principal portion of the chief plaza or grand square thereof. A map of Arizona will show the value of this point as a trading post, and will indicate also its future importance, provided always the railroads going east and south shall pass through it. Tucson is now the central point on the overland route, and for communication with Sonora. It is the seat of the nearest United States Custom House thereto.



CITY OF TUCSON, ARIZONA.

The engraving on this page, taken from "Picturesque Arizona," published by the Continent Stereoscopic Co., of New York, represents Tucson as it appeared in 1877.

Of late the mining industry of Pima county has been rapidly developed, particularly by the rich strikes made in the Tombstone district and other localities.

The blood-thirsty Apaches murdered the early miners and destroyed the mining appliances, and what the Indians left intact the Mexicans destroyed, and it was not until the Camp Grant massacre of the spring of 1871 that the long outraged people of Pima county took the settlement of the Indian question into their own hands, and, trailing the thieving, murdering, blood-thirsty Apaches, with the plunder they had stolen, into Camp Grant Indian reservation—their city of refuge—then and there our people made them atone for the hundreds of innocent lives they had treacherously and barbarously taken.

This good piece of work was the means of the government sending General Crook to take command of this department, whose Indian policy brought the Indian question to a successful issue, and at the close of 1874 the great body of the Apache nation in Arizona was subjugated. Many regenades, however, continued to infest the rich mineral districts of the country until 1877, when they were finally killed or driven out by the hardy pioneer and prospector with rifle in one hand and pick in the other, with his canteen with water and beans on his back he faced the treacherous red devils, until the regenade Apachs is heard of no more. In Arizona as in California, the peace, the prosperity, which now dawns upon them is largely due to the indefatigable, the brave and stout-hearted miner, prospector and farming pioneers.

The richness of the mines is now an accomplished fact, and improved appliances rapidly bringing to light the wealth so eagerly sought in times gone by at the risk of the miner's life. And the Tombstone, as early as 1860, declared by its discoverer, Bronkow, to be the richest mineral district in the territory, has, by late developments, placed him upon record as a true prophet, finding his pabulum for prophecy, however, in known facts.

Railroad communication, so soon to bring Tucson within reach of a market and to bring her within the pale of mechanical civilization, will remove any doubts about her future that her timid citizens may possess engendered by reading old archives.

PUBLIC STEAM HEATING.—A project to introduce public steam heating in New York has been sanctioned by the Commissioners of the Sinking Fund. The system is known as "Holly's steam combination system" for heating, cooking, and other purposes. It is claimed that by it there will be a saving of $150,000 a year in the heating of the public buildings. It will also save the city from $300,000 to $500,000 per annum in the removal of ashes from the dwellings and snow and ice from the principal streets and avenues. The steam will be conveyed through pipes laid in the street, and supplied for any purpose. Its cleanliness and many advantages to the housekeeper cannot be estimated too highly. The city is to receive $150,000 from the company for permission to lay the pipes, and a further compensation of 3% of the earnings of the company. That section of the city south of Canal street is set apart for the purpose.

THE shrinkage of values does not seem to have affected the price of seats in the New York Stock Exchange. A gentleman, anxious for the right to buy and sell in the charmed enclosure, bid $11,500 for a seat, at auction last month—the highest price ever paid.

TWO HUNDRED AND FIFTY emigrants from Iceland are en route to Minnesota.

Intersecting Cable Wires.

We have been shown the model of an invention for wire cable grips, whereby a crossing can be effected at intersections. The inventor is Vitruvius Frazes, architect, 137 Montgomery street, S. F., and his invention solves a multitude of problems connected with traffic over cable roads. The object of the invention is to furnish a means by which cars propelled by a cable running beneath other cables may cross such cables without any appreciable interruption, and without any special care on the part of the engineer. The cars to which it is attached may be stopped and started at any point on a crossing. The cable is always within the dies when crossing another cable, and the dies may be tightened or loosened at any point. No interchange of signals between cars of intersecting lines is necessary, because they may pass immediately in advance or in the rear of each other without any interference of their cables. The device has also another advantage in that it may be constructed to carry the cable to which it attaches anywhere from 9 to 16 inches below the surface, and however it may carry a cable it can cross any number of cables lying at various depths below the surface without touching any of them. Three notched-wheels revolving in a nearly continuous flange, each wheel having three semi-circular notches or openings somewhat larger than the cable to be passed, are attached to the lower gear or grip of the car. The flange is broken only to admit the intersecting cable passing through at right angles, the passing cable turning the notched wheel and directing the cable into the next wheel and so on until passed.

The lower gear of the grip—that part below the notched wheels—is provided with an inclined plane projecting out in front of it, which forces the cross cable upon a pulley attached to a stationary cable lifter, and thence on and in between the notched wheels. The cable runs through between the grip and sliding bar into the wheels as perfectly as if an open unencumbered slot or passage existed, and the grip upon the drawing cable being maintained without any exertion. The whole contrivance works automatically, and what would seem to be difficult to overcome is overcome in a simple manner.

The grip itself is composed of a number of small pieces resting upon a rubber base or foundation so as to distribute the force or strain over many parts, instead of one, thus saving the wire. This latter is a device unconnected with the crossing contrivance. We shall have occasion in a future number to illustrate the invention more perfectly than can be done in a written description.

REDUCING THE ESTIMATES.—It is not long since the Colorado press was computing the bullion product of Leadville for the current year at something like $100,000,000. Their present figure is $11,000,000, about the annual yield of Eureka, Nevada, a camp concerning which little is heard compared with the much said about Leadville. We hope there will be no cause for further reducing the bullion output of Leadville, the monetary world having adjusted itself for a large influx of silver from that source.

JUSTICE IN ENGLISH COURTS.—The English bondholders of the ill-famed Emma mine of Utah, brought suit against Lewis & Son, metal brokers in Liverpool, to recover damages on the ground that they had conspired with Treanor W. Park and others, to cheat the plaintiffs. The jury found for the bondholders, to whom they awarded $40,000 damages, value of the stock assigned defendants by their coadjutors.

WASHINGTON TERRITORY last year exported 160,000 tons of coal and 21,000,000 feet of lumber. Over 600 ocean vessels arrived and departed in the same time.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds

Carson and Vicinity.

EDITORS PRESS:—The progress of Carson, the silver capital, in connection with the general progress of the great mineral State, is one very clearly marked from year to year, though not with entire uniformity. The lands in the vicinity, reclaimed by irrigation from the dry, sage brush plain, are more extended. The fields and gardens are better cultivated. Lines of trees, groves, orchards, and ornamental shade trees are increasing in size and beauty. Family residences and permanent buildings are gathering all lovely attractions around them, while within the neatness and adornments and luxuries of life, are greatly increasing. The stores, shops, manufactories, hotels, and business houses are larger, better supplied and finer in interior and external appearance; the streets are in good order, level, graded by nature, and free from mud. The two public school buildings, the three churches, the State capitol, and United States Mint, are of their kind fine structures, each in character with its design. The streets and houses are lighted by gas, and the whole city, in all parts, is well supplied with abundance of the best of water.

The scenery around is romantic, rugged and grand. A little to the west, perhaps a mile and a half, the great, varied Sierra range rises abruptly near four thousand feet into the heavens, with summits rarely if ever entirely free from snow, with sides once wooded nearly to the tops now mostly cut away for lumber and firewood in the mines. To the north and south barren spurs from the Sierras, broken and irregular, extend across to the east to connect with higher ranges, running north and south, shutting in the regions of the city as one enclosed, even, pleasant, valley; one which might be made to flourish as a garden in beauty, if a large irrigating ditch could be dug for the watering of the whole. This can be done, and will be ultimately, when needed by the immense population which must dwell in America a hundred and twenty years from now. This, at the rate we have increased the last hundred years, will be over 1,600,000,000 of people. We shall soon need all the land possibly available for cultivation for our own population, without any from Asia.

Though this valley appears shut in, yet the Carson river, coming down from the south, passes along the eastern edge and cuts its zigzag deep canyon way through the eastern ranges on to its lake of evaporation, sixty miles to the northeast. Down this river, from forests in the mountains at its head, are floated some 60,000 cords of wood yearly for use in the mines and mining towns. Yet this is not probably over one-fourth of the amount of wood and timber used in connection with all the mining in the region. The larger supply comes by the railroad, some even from California, but much of it reaching the road by long water Flumes or chutes, bringing down the wood from the region of forests seven, or even twenty, miles away in the mountains. By this process thousands of acres of timbered lands on the eastern steep slope of the Sierras, are being yearly swept clean of all trees, left, in appearance, as barren as if they never had any growth of trees upon them. Some scientists say this will cause these slopes to be forever barren, and diminish the already very slight fall of rain through the whole country. We very much doubt this, for if so then the denuding of more than one-half the vast region of continuous forests east of the lower Mississippi, Ohio and Missouri rivers to the Atlantic ocean, and the covering of the immense prairies of Illinois, Missouri, Iowa and Wisconsin with cultivated groves of trees ought to have produced decided changes in the rainfall, proved so by reliable statistics. Certainly such denudation does affect the springs and the moisture in the soil, and also the uniform flow of the streams and rivers; yet we doubt its very sensible effect upon the average fall of rain.

Chicken Soup Spring.

There is, a mile and a quarter north of Carson in the open plains, a large hot flowing spring. Its perfect analysis has not been made, but there is a little sulphur with iron, manganese, etc., in such very moderate quantities that the fountain appears to differ but little from that of common hot water. But by merely stirring into a bowl or glass of it some common salt and pepper the color changes to accord with the taste, which is so like good palatable chicken soup, a stranger would not detect the difference. Certainly, to us, the resemblance was perfect, as we drank it, and we believe that had it been given us in the city at a restaurant for chicken soup, we should not have detected the imposition. The water is also said to be excellent for all rheumatic and kindred disorders, and is remarkably excellent for bathing, producing no lassitude like other hot springs by one remaining in it a length of time.

In the hills surrounding Carson and its beautiful valley quite a number of mining claims have been laid and partially opened, some with really encouraging prospects. Still, as yet, none of them have been made to pay the expenses of working. Copper, lead, antimony, silver, gold, iron and even coal have been found, and in time these may be worked to advantage, though not at present. S. V. B.

Mono County Mining Interests.—No. 1.

EDITORS PRESS:—The people of Bodie are as much excited over its own prospects as are the stock dealers of San Francisco; and this seems like a strong statement. Hundreds of mines are everyday expecting and likely to encounter rich ore, though most of them are running prospecting shafts only. There are quartz ledges varying from one inch to 13 feet in thickness. The Bodie mine is producing the richest ore, and the ledges are now found dipping to the east. As worked heretofore the mineral ledge had a dip to the west; recently, however, they became vertical and appeared to be pinching out; now they find them dipping to the east and increasing in value and width. Another notable fact is, that the amount of silver in the alloy is fast increasing, which, according to precedent, would indicate a permanence in the production, and eventually, the encountering of silver as the predominating metal, as has been found to be the case in Nevada. Furthermore, from this we may conclude that Bodie camp is not one of the wildcat kind, but one which is to produce largely as deep down as it becomes practicable for machinery to work.

The 206 level of the Bodie mine is producing from a ledge two feet wide a mineral which is fairly spangled with gold. The gangue is a crystalline quartz of a gravelly consistency, occasionally holding crystals well developed, and the whole is of such a nature that a blow with a pick or hammer breaks it into small pieces. The veins seem richest at the point of contact with the wall, and here is found a fine red clay; it seems to have penetrated the vein matter in mechanical solution and remains a plastic mass, which has to be dried before milling. On the 430 level is found a vein whose gangue is of harder and purer quartz, containing the same clay and whose richness shows a higher figure than anything of the kind ever met. As some have remarked: "It hardly decreases in volume when washed." In many instances the precious metal holds the quartz together as the cementing material of an ordinary conglomerate. No water troubles the Bodie mine on either level, but the ventilation is not as good as it should be. There is a dependency on the atmosphere, which in this district, 9,000 feet above the level of the sea, is rendered unreliable on account of its extreme lightness at times. Attention to the matter would insure better labor and more of it from those employed underground. We are assured that on the day of our visit it was unusually bad.

The Standard company produces more ore than any of the others; ore of a quality not as valuable as that from the Bodie, but rich enough to pay a very large profit on milling. The Standard company now has three shafts running constantly: The Standard proper, the new Standard and the double Standard. The first is producing most of the ore crushed at the Standard mill; the second, the new Standard, is so flooded with water as to be unable to produce much ore at present, the heavy pumping machinery being erected will soon put them in condition for hoisting out ore with facility; the third or double Standard has not as yet found any paying ore, but has just begun the erection of extensive hoisting works to supplant the horse power heretofore employed. The Syndicate mill is running on ore from the New Standard mine.

The Summit is getting out ore now, but crushing none at present. The one custom mill, the Miners' mill, is crushing for the Noonday mine, which has considerable ore on hand. J. H. W.

Bodie, June 30th, 1879.

Breaking up Slag with Rock Salt.

EDITORS PRESS:—An item gathered in Carson we judge worthy of especial note for the benefit of all, gas makers in particular. In the furnaces of gas works there always gathers a very hard, solid slag; very difficult to remove even with iron bars. The attendant in the works at Carson told us, that, by accident, he found that throwing in onto this hot slag, after the coke was drawn out, a handful or so of common rock salt rendered this slag, in a few minutes, easily drawn out like coarse, pebbly sand. If one handful should not loosen up the whole mass, another handful could be also thrown in, and the result was certain; the slag could all be drawn forward the same as ashes. This fact must be of thousands of dollars value to the many gas manufacturers in the land, and it is free for their use. Experimenting will make evident the best manner of using the salt for the purpose. S. V. B.

Carson, Nev.

MAGNETIZATION OF NICKEL.—According to M. Henri Becquerel, in the *Comptes Rendus*, bars of nickel become saturated with magnetism much more promptly than iron bars, and hence are better suited for temporary magnetization—a fact which might be useful in telegraphy. Cobalt gives results similar to nickel.

THE Holly system of heating by steam is about to be tested in the city of New York on the lower end of Canal street. Pipes are to be laid in the street and steam supplied for all household and mechanical purposes.

Brains.

Brains, though rare, are not distributed by any known rule among a particular class of people. A Stephenson may be born in the cottage of a common miner, and rise to teach the world the science of engineering. A Franklin may force his way from a printer's case to the position of a great statesman and a great physicist. Opportunities are what are required, and lacking the opportunity there would not have been any Stephenson nor any Franklin. Comparatively few men of ability are born every year, but they are as likely, perhaps more likely, to be found in the humble dwelling as in the palace. The important problem for any country is, how to utilize its most valuable raw material so as to get the greatest possible effect from it. In the case of brains the answer is simple: give their owners an opportunity to get an education by which their mental faculties can be afforded an opportunity of being used to advantage. Bring out their natural abilities. If the boys about a mine or in industrial communities, instead of spending their leisure hours in taverns or even worse places of resort, listening to the harangues of demagogues upon the wrongs of the workingmen, should utilize them in a school where a technical education could be imparted, they would with an increase of knowledge take more interest in the prosperity of the country, and have more confidence in the stability of government, and believe that there is a future open to them worth working for. When witnessing the utter demoralization of many of our youth, who does not recall the words of Dickens, "There is not one of these poor creatures but sows a harvest that mankind must reap." The poor working classes have their wrongs, but in a great measure they are brought about by the sudden elevation of some of their own number using oppression, through deficient education, or by their own excesses or indolence.

Between practical foremen and educated engineers there exists a jealousy which must be wiped out by the inculcation of a higher education and opportunities to develop. The resources of the locality where is the domicile, the home, must govern the educational course—mines in a mining region—agriculture in a farming region—and cosmopolitan studies in the cities—otherwise the mind finds its surroundings uncongenial and is dwarfed. Like a tree transplanted to an unaccustomed soil and climate it withers and dies, or lingers through a sickly existence. Preaching about the evils that beset communities will do no good. Practical common sense must apply a remedy.

On the Metallurgy of Platinum and Iridium.

Contributions to the metallurgy of the metals of the platinum group are so rare, and the information given in text books so meager, unsatisfactory and superannuated, that a brief description of present practice will be welcome. This has been furnished recently by Mr. George Matthey, of the famous platinum smelting and manufacturing firm of Johnson, Matthey & Co., of London, in a paper read before the Royal Society. According to this—probably the best authority living—the commercial platinum is melted with six times its own weight of pure lead, the alloy granulated and treated in dilute nitric acid until fresh acid fails to act. This dissolves out the greater part of the lead, and the copper, iron, palladium or rhodium which may be present. The residue, a black powder, is dissolved with weak *aqua regia*, which leaves behind a residue consisting of all of the iridium and a portion of the platinum contained in the black powder. After evaporation of the solution of the chlorines of lead and platinum a sufficient amount of sulphuric acid is added to effect the precipitation of the lead as sulphate. The chloride of platinum is dissolved out with distilled water, and precipitated with an excess of chloride of ammonium and sodium. The whole is then heated and allowed to stand for some days, the ammonio-chloride of platinum settling down as a fine deposit, while any sodium, if present, will remain in solution, which has a rose tinge therefrom. In order to effect a purification of the platinum precipitate, it is dried, and after adding bisulphate of potash, with a small proportion of bisulphate of ammonia, it is subjected slowly to a dull red heat. Thus the platinum is reduced to a black, spongy, porous mass, while the rhodium is obtained in the shape of a bisulphate of rhodium and potash, soluble by digesting with boiling distilled water. A small quantity, it is true, is dissolved as a sulphate together with the rhodium salt, but it is regained by heating the residue after evaporation to redness, at which heat the platinum salt is reduced to a metallic condition, while the sodium salts remain undecomposed. The platinum obtained as a spongy mass from the heating of the chlorides is melted, and yields a pure metal, having a specific gravity of 21.46, the highest attainable. The iridium obtainable from its ordinary solution is quite impure. Mr. Matthey fuses it with lead, dissolves out the lead with nitric acid, and fuses the residue with bisulphate of potash, by which the rhodium is removed. Then it is melted with 10 parts of caustic potash and three parts of nitric for a long time, and the cold product is lixiviated with water, which dissolves out the ruthenate of potash, while the corresponding iridium salt remains behind as a blue powder which, after being washed with hypochlorite of soda, is mixed with a strong solution of that reagent and slowly heated to the boiling point in a distilling vessel, thus removing the ruthenium. The blue powder is then dissolved again in *aqua regia*, evaporated to dryness, redissolved in water, filtered, and the dark colored solution thus obtained poured into a concentrated solution of soda and hypochlorite of soda. Iridium is then precipitated as an oxide by passing chlorine through the solution, and the precipitate so obtained is reduced by the combined action of carbon and carbonic oxide, generated by heating gently a mixture of oxalic and sulphuric acid. The metal so prepared is purified by subjecting it to the action of chlorine water and hydrochloric acid, and is then cast into ingots, having a maximum specific gravity of 22.38. Mr. Matthey uses the metal in the preparation of malleable and ductile alloys of platinum and iridium, holding 10% to 20% of the latter. These are claimed to combine the more valuable physical properties of both the metals in an exceptional manner. It has much of the malleability of platinum and the hardness of pure iridium.

Hypnotism and Science.

Mankind, in hot pursuit of pleasures and the wherewith to procure them, are hardly aware of the silent labor bestowed upon their amelioration by those engaged in scientific investigation. Periodically an astonishing discovery is made, some hidden force of nature is utilized, and the world amazed stops, adopts the convenient discovery, and then, condemning it by reason of that familiarity which breeds contempt, rushes on again in its mad whirl of physical excitement. Too much devotion to the purely physical development has always, and perhaps will always, prevail. The pure, theoretical pleasures of the mind are to a great extent wholly disregarded. Perhaps science is not altogether blameless for this condition of things. Monotony of any description cloys the reasoning faculties, and excites finally distasts and abandonment. From the purely speculative philosophy of the ancients, we have as a matter of course fallen into the opposite extreme, obeying, humanly speaking, that law of nature which causes all disturbed bodies to gravitate, or vibrate until rest, equilibrium is restored. Literally we are vibrating to and fro, on a pendulum, and have fallen asleep. Some day science will stop our pendulum, and we will awake to discover, that in spite of our bodily activity, we have really been sleeping. Science as well as common sense tells us that vice is ruinous to the mind and body. Religion rebukes us if we go astray. We laugh at both, and why? The truth is our prejudices are still deep-seated, and we are bound to have what we term pleasure. All this is the result of erroneous ideas imbibed perhaps in our youth, from a too constrained watchfulness. Science steps in and aids religion, while it has nothing whatever to do with it; but its aid is not that of violent denunciation, but the bringing into submission to man's uses and enjoyments all of the forces of nature. The workings of science are quiet and peaceful, unknown to the majority, but nevertheless effective, and will accomplish more than prohibitory laws ever can, and for the reason that they furnish him with all he requires or desires, and imposes no restrictions upon him. This is just what the heart of man desires in the present condition of the world, and when this shall be accurately known and understood, mankind will awake from an unreasoning sleep and be improved in health, morale and general intelligence.

THE BLESSING OF LABOR.—I believe that for most men more than eight hours' work per day is required for the maintenance of physical, mental, and moral health. I think that for most men including operatives, mechanics, farmers, and clergymen, more than eight hours' labor per day is necessary, in order to keep down and utilize the forces of the animal nature and passions. I believe that if improvements in machinery should discharge men from the necessity of laboring more than six hours a day, society would rot in measureless and fatal animalism. I have worked more than ten hours per day during most of my life, and believe it is best for us all to be compelled to work. It would be well, I think, if we could make it impossible for an idler to live on the face of the earth. Religious teachers are not without responsibility for having taught that the necessity of labor is a curse. The world owes most of its growth hitherto to men who tried to do as much work as they could. Its debt is small to the men who wished to do as little as possible. —*June Atlantic.*

LOW WATER IN BOILER.—Whenever the water in a boiler becomes dangerously low, the attendant should immediately draw the fire and allow the boiler to cool. He should not admit any cold water to the boiler, or attempt to raise the safety valve, as this is a dangerous proceeding. It lessens the pressure by allowing the steam to escape from the boiler and thus permits the water to rise and come in contact with the overheated iron. Probably many explosions have been caused in this way.

MECHANICAL PROGRESS.

Steering Made Easy.

To avoid the slacking of rudder chains and the constant jerking of the rudder in a rough sea, Capt. Sam Martin, of New York, has hit upon a valuable invention. His plan is to cut out a certain section of each rudder chain about midships of the vessel, and in the place of the detached pieces put cylinders. In each cylinder he placed a piston, and connected the rudder chains with each piston. This done he had to all purpose the same old steering apparatus, for the pistons were simply links in the rudder chains, and could be moved by turning the wheel in the pilot-house. The next thing to do was to apply steam to the cylinders. They were consequently joined by a steam pipe, the boiler was tapped, and the steam supplied through a valve in the pipe connecting the two cylinders. The valve he operated from in the pilot-house. When the lever in the pilot-house was straight, it showed that there was no equal pressure on both pistons, and that there was as much steam in one cylinder as the other. As the lever was moved, and the rudder turned, it transferred a percentage of steam from one cylinder to the other, and as the piston of the right cylinder went in, the piston of the left proportionately ran out, taking up the slack chain at the stern and holding the rudder taut in any position. By turning the lever to a certain point both cylinders were exhausted and the steam shut off.

The wheel in the pilot-house not only served as an indicator, night and day, to show that the cylinders were answering the turn of the lever, but it could be used in another way. If there was a break in the machinery, or the steam ran low, the vessel could be steered in the old-fashioned way with a man at the wheel, the pistons in the cylinders acting as a link in the chain that leads from the wheel to the rudder. A practical experiment on the steamer *Maryland* from Jersey City to Harlem, satisfied every one that a boy of ten years could manage the helm.

The main point of Capt. Martin's invention is its cheapness. He says it can be put in any steam vessel for an eighth of the cost of any steam steering apparatus now in use, and the cost of the steam is a mere bagatelle. Those now in use are run by donkey engines, requiring the services of extra men at the engines. Capt. Martin gets his steam from the boilers in actual use, and dispenses with the services of men already employed.

SUBMARINE ENGINEERING.—Some very interesting experiments have lately been made in raising sunken vessels or other submerged objects by a plan invented by a Viennese engineer. The Berlin *Tribune* says that the agent employed to lift the sunken objects is carbonic acid gas, generated below the surface of the water. In an otherwise empty balloon a bottle of sulphuric acid is placed, embedded in a quantity of Buller's salts, and an arrangement is provided by which the bottle can be broken at pleasure. The balloon, empty, with the exception of the bottle and the salts, is taken down by a diver, and securely attached to the object to be raised. The bottle is then broken, and the sulphuric acid thus set free percolates the salts and generates carbonic acid gas, which inflates the balloon, and after a time, causes it to rise to the surface, bringing with it the object attached to it. The trials which have been made with this new apparatus have, as yet, been only on a comparatively small scale, but they are stated to have been, so far, eminently successful. A small vessel, weighing several hundred pounds weight, was sunk in 60 feet of water, a diver was sent down and attached the balloon to it, and in a very short time the machine appeared on the surface of the water, bringing the vessel with it. On another occasion five sacks filled with sand were thrown overboard in 50 feet of water, and in five minutes were similarly recovered.

PRINTING PRESS MARVEL.—It is a puzzle to the ordinary mind that an unbroken sheet of paper may be made long enough to stretch from St. Louis to Illinois Bluffs, seven miles away. But what can exceed the ingenuity that constructs a machine that with a push of a lever takes the snowy paper into its ponderous iron jaws, and with the speed of an express train, imprints upon it even the faintest hair line of the smallest type, divides it accurately and uniformly into pages, places it in a book form, glueing the backs, cuts the edges, and then folding these pages as evenly and smoothly as a girl would fold her first love letter, delivers the perfect newspaper—six, seven, eight, in one second!—*Missouri Republican.*

NARROW-GAUGE RAILWAYS.—Light railways with gauge varying from 18 to 24 inches can be advantageously employed in carrying on a large farm, a stone quarry and similar works. A London firm is making light railways a specialty, and from their circulars it appears that the entire material above the road bed for 10 miles of railway, with a locomotive and car, can be obtained for as little as $2,500 to $3,000. We fully believe that light railways of narrow gauge are eventually to take the place of horses and wagons to a considerable extent, not only for public but also for private purposes.

TIN PLATE MANUFACTURE.—The consumption of tin, or more properly tinned iron, costs this country every year nearly $20,000,000, of which at least $15,000,000 is for labor which ought to be paid to American workmen. Some progress has been made in this industry in New York city. The Monitor Tin Plate Company, of New York, occupies a building in Horatio street, where the tinning is done. The iron is rolled in Pittsburg, Pa. The sheets are rolled in the ordinary way, then cut or sheared to size and immersed in a pickling bath. They are then cold-rolled again, annealed and pickled, and put into baths of Russian tallow or palm oil. Then they pass through several baths of tin melted at a high temperature and again through sawdust and bran to cleanse the surface. Finally they are polished with lamb's-wool cuffers and assorted, ready for boxing or shipping. This is the old method of tinning by hand that has been in vogue in Europe for the last hundred years. We believe that the same results can be accomplished by the use of machinery, in which case the tinning will be greatly accelerated, and the cost of tin much decreased. The business has assumed such importance that the late convention of iron and steel manufacturers held at Pittsburg sent a petition to Congress suggesting a change in the law imposing duties on tin, stating that the tin plate business represents an annual consumption of over 150,000 tons of pig iron, about 1,000,000 tons of coal, and about 50 rolling mills having two trains each, all required to supply the demand for that article, and that protective duties should be imposed to develop this industry which would give employment to at least 40,000 persons.

SPIDERS KILLING TROUT.—Seth Green, the noted pisiculturist, has been for a long time puzzled by the terrible destruction of very small trout, and his investigations have at length resulted as follows: "There is a small worm which is a favorite food of trout and many other kinds of fish. This worm is one of the greatest enemies which the young fry have. It spins a web in the water to catch young fish, just as a spider does on land to catch flies. I have seen them make the web and take the fish. The web is as perfect as that of the spider, and as much mechanical ingenuity is displayed in its construction. It is made as quickly and in the same way as a spider's, by fastening the threads at different points, and going back and forth until the web is finished. The threads are not strong enough to hold the young trout after the umbilical sac is absorbed, but the web will stick to the fins and get around the head and gills, and soon kills the fish. I have often seen it on the young trout, and it has been a great mystery and caused me many hours, days and weeks of wonder to find out what was wound around the heads and fins of my young trout and killed them. I did not find out until lately, while watching recently-hatched whitefish. These are much smaller than the trout when they begin to swim, and they were caught and held by the web. I found ten small whitefish caught in one web in one night. The web was spun in a little whitefish preserve into which I had put 100 young fish."

A NEW ROAD LOCOMOTIVE.—A new road locomotive has lately been patented by Richards & Dale, 36 Taylor street, Springfield, Mass., in which the traction will be secured by vertical bars acting as feet, dispensing entirely with driving wheels. The motive power will be applied directly to the main shaft by a crank-rod and crank, as in ordinary engines. No new principles being thus involved in the use of the steam, the machine is very simple and more likely to be practicable. The frame of the engine is horizontal with a two-wheeled truck at the rear end, while the main shaft is in front, in a horizontal transverse position. This shaft bears four cranks in addition to those that drive it. Upon each of them is a leg consisting of a straight bar, provided at the lower end with a suitable foot or shoe by which the traction is obtained. There is also an arrangement for shortening the length of the step in ascending grades or drawing unusual loads. The machine will work equally well backward or forward, and if a foot should happen to cut a channel in the ground without drawing the carriage forward it can be turned in either direction to get a fresh start. The engine may be detached from the feet so that it can be used for hoisting as well as locomotion. In the absence of illustrations we are unable to say whether the machine could be made serviceable in our mining regions or not.

IMPROVEMENT IN CHANDELIERS.—A patent has been taken out by a Philadelphia inventor for a sliding chandelier, which has none of the dangerous and cumbrous mechanism of hydraulic pulleys, chains and weights now in common use. The apparatus consists of a cylindrical chamber, about two inches in hight and one and a half inches in diameter, closed at top and bottom. Within this is a dual spring; a brass band slotted down the surface, rimmed at the top and turned at the base, being encircled by a coiled spring, the two contracting and expanding automatically. Within the band, and filling up the space which surrounds the sliding rod, passing through the chamber, are a number of perfectly rounded and smooth metallic marbles, and these, together with the double spring, firmly grip the sliding rod, which can be drawn down or pushed up with freedom and certainty, and without the possibility of the rods slipping, or the apparatus getting out of order.

SCIENTIFIC PROGRESS.

THE WORLD IN WAX.—Mr. Grube, a maker of wax images in New York city, has constructed what is claimed to be the largest globe of the world, showing the ranges of mountains and other peculiarities of the surface of the earth, in relief, now in existence. Its diameter is four feet and about one inch, the scale being one in 10,000,000. The range of even the Himalayas would not be visible upon this globe if the scale were adopted for the elevations as for the map, and accordingly the relief is made upon a scale which exaggerates hights twenty times. The oceans, seas and rivers are colored blue; the continents are yellow; the glaciers, icebergs and floating cakes of ice white. Plains and mountain ranges are clearly shown, and every part of the world is exhibited in its true character. Red, black and white lines cross the globe to indicate the isothermal belts, the variations of the magnetic needle, the date line where ships correct their logs by skipping from Saturday to Monday, and *vice versa*, and other facts of like character. The map has been corrected in the light of the latest discoveries down to two months ago. The northern coast of Siberia has been much altered in the atlases by the Nordenskjold expedition, the ships sailing in deep water over places marked as 500 miles inland, and being compelled to go hundreds of miles around promontories, etc., which are occupied on the maps by bodies of water. The globe is made of wood. The relief is formed by wax. Mr. Grube has been two years in perfecting his globe, and Chief Justice Daly and other geographers have lately been giving attention to it.

NEW ANTISEPTIC SALT.—During some experiments in separating sugar from molasses, a double salt of borate of potassium and sodium was found, that proved to have valuable antiseptic properties. This salt is now manufactured on a commercial scale, and costs about 10 cents a kilogramme or five cents a pound. It is obtained by dissolving in water equal quantities of chloride of potassium, nitrate of sodium and boric acid, filtering and evaporating to dryness. The salt is said to be quite deliquescent, and must be kept in tight bottles. It is quick in action, retains its qualities for a long time and has no injurious effect upon the taste, smell or healthfulness of the substances to which it is applied. It has already found a use in making sausages, in preserving meats, in tanning and in butter-making. A small quantity of the salt added to milk will preserve it in good condition for a week. It is also used in preserving beers and wines, and is being made the subject of experiments in several other directions.

INDIAN STEEL.—The remarkable metal known as *wootz*, or Indian steel, is now imitated with considerable success in some of the workshops of Europe, the process being as follows: Small pieces of very good forged iron or steel are put in a crucible and covered with charcoal; air is carefully excluded, and the mass exposed to heat until it turns dark gray—carburet of iron, this is easily pulverized, and in this state it is mixed with alumina and subjected for a long time to a white heat in a crucible, when it becomes white and brittle. If 1-16 to 1-12 of this white mixture is melted with some good steel, a very good imitation of Indian steel is said to be the result. Commercially speaking, the genuine raw steel, or wootz, comes in three forms, namely: in bullet-shaped pieces of certain weight, as they cool in the pots, and which comes from Calcutta; in cakes of two and a half pounds, from Bombay; and in cylindrical rods of about the same weight, from Golconda.

CHINESE PORCELAIN.—The Chinese subject the greater part of their porcelain to but one firing, first drying the pieces sufficiently in the air to prepare them for glazing. This plan they are able to pursue, because the nature of the material is such that it resists the entrance of water. Their glaze is much superior to any in use in the European potteries, but it requires the most intense degree of heat for its fusion, and considerable art is consequently required for the management of the fire, as well as in the construction of their ovens. These are built in the most substantial manner, so that when the fire is at its greatest hight the band may be applied to the outside without any fear of burning.

TOUGH OLD IRON.—Two specimens of old iron, made some 60 years ago, were recently taken from a bridge in Baltimore and tested, with the following results: Specimen No. 1, (wrought iron) 11 15-16 inches in length, elongated to 12 9-16, broke at a strain equal to 52,836 pounds. Specimen No. 2, length, 10¾ inches, elongated to 12½ inches, broke at a pressure of 61,880 pounds. The bolts were placed in the bridge when it was built, 60 years ago. It may well be queried whether any great advance has been made in the manufacture of iron as to quality, in the time that has elapsed since those specimens were made and placed in that bridge.

NEW DYE. — Sulphoamidoazohenzolic and sulphoamidoazotoluolic acids have been made permanent canary and orange yellow dyes by the conjugation of the sulpho-acids with amidoazobenzol and amidoazotoluol, the excess of acid neutralized by dissolution in alkali and concentrated. The colors are dyed in a slightly acid bath.

COATING IRON WITH IRIDESCENT COPPER.—A writer in the London *Mining Journal* thinks the invention of Dr. Weil, of Paris, for coating iron and steel with copper or nickel in such a manner that the surfaces shall be iridescent, opens a large field for the employment of metal for decorative purposes. He has found that the best mode of preparing the metalizing bath and the best proportions of ingredients are indicated in the following directions: First, 35 parts of crystallized sulphate, or an equivalent amount of any other salt of copper, are precipitated as hydrated oxide by means of caustic soda or some other suitable alkaline base; this oxide of copper is to be added to a solution of 150 parts of Rochelle salt, and dissolved in 1,000 parts of water; to this 60 parts of best caustic soda, containing about 70% NaO, is to be added, when a clear solution of copper will be formed. All colors, from that of brass to bronze, scarlet, blue and green may be produced at will. A Gramme machine may be substituted for the alkaline bath. The ornamental iron castings made both in Great Britain and France are really beautiful in form and design, and by the judicious coloration of them with combinations of iridescent brass and scarlet, brass and blue, or brass and green, would produce effects which would insure their general adoption.

THE SPECTROSCOPE AND HIGH TEMPERATURE. The employment of the spectroscope in the comparative measurement of high temperatures has been described by M. Crova, of Montpellier, France, before the Academie des Sciences. According to his description, this instrument can be employed to measure temperature hitherto incalculable. The process which he recommends is thus described: Having first adopted some arbitrary standard, he proceeds to examine the flames of incandescent bodies with the instrument, and reduces them, by the interposition of obstructives of known value, to the same level as that of the standard. To this combination of devices he applies the name of spectrophotometer. Prof. Crova adopts as his standard the heat emitted by an ordinary moderator lamp burning oil, which he fixes at 1,000°. In making his comparisons, he finds the heat of a piece of platinum heated to redness to be 524°; the same at white heat, 810°; a regulation stearine candle, 1,162°; an Argand burner of common coal gas, 1,373°; lime light, oxygen, and coal gas on lime, 1,806°; the electric light, 60 Bunsen elements, 3,060°; and the light of the sun, 4,049°.

POSITION OF THE PLANETS FOR JULY.—Mercury can be seen after sunset all through the month of July. Early in the month it keeps nearly the path of the sun; later it moves south of the point of sunset. On July 20th, it may be seen east of the crescent moon. Venus, on July 8th, passes near to the planet Uranus, but moves rapidly toward the east. It will be near the crescent moon July 22d. Mars, Saturn and Jupiter can all be seen at a late hour in the evenings of July, about midnight. Jupiter will be known by its size and brilliancy, Saturn by its white light, and Mars by its ruddy glow. Uranus may be found with an ordinary glass by its nearness to Venus. On July 8th, Uranus is a little south of Venus, after that it will be found west of Venus and a little north.

SELENIUM CAMERA.—The *Scientific American* refers to some very ingenious and curious applications of selenium, in which its peculiar property of changing its electrical conductivity when exposed to light varying in intensity, is utilized. The several devices are the invention of Mr. George R. Carey, of Boston, Mass. Perhaps the most curious of these instruments is the selenium camera obscura, which is capable of transmitting, telegraphically, an image of any object and making a permanent impression of it at a distant point. In this case a person may sit before the camera in New York while his photograph is made in Boston.

COLOR OF THE ELECTRIC LIGHT.—By the combination of the suitable chemicals during the manufacture of the carbons, or by saturation afterward, almost any colored tint may be obtained. The natural violet rays are neutralized by the addition of a few grains in each carbon of chloride of sodium, producing a yellow tint like the sunlight. Magnesia produces a very white light, and is well adapted to photography. A mixture of arsenic, on the contrary, produces a light almost devoid of chemical effect. Various proto-salts and sulphates of the metals may be so combined as to produce almost any desired color.

POLARIZED LIGHT IN GASES.—The rotation of the plane of polarized light in gases has just been effected by two German experimenters, MM. Kundt and Rontgen, with the aid of powerful electro-magnets, made by passing the current from 64 Bunsen cells through six coils of thick wire (each comprising 400 turns) surrounding a tubular iron core. They showed that saturated vapor of carbon bisulphide at 100° C. rotates the plane of polarization of light in the magnetic field produced by this electro-magnet.

TRANSMISSION OF POWER BY ELECTRICITY.—Profs. Houston and Thomson have experimentally shown, at the Franklin Institute, that powerful electric currents can be conducted by very fine wires. They sent the current generated by one dynamo-electric machine through a wire .004 inch in diameter to a second machine, which, working reversely, gave off considerable power.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending June 19		Week Ending June 26		Week Ending July 2.		Week Ending July 10	
Alpha	29½	23	30	25½	28	24	28	25½
Alta	10	8¼	8⅜	6⅜	10⅞	6⅞	12½	9
Andes	1.15	65c	1	75c	1.45	90c	1¼	1.15
Alps	....	....	....	....	....	....	....	....
Argenta	1.15	1	1.20	1	1.05	1	1	85c
Atlantic	50c	....	35c	30c	35c	30c	40c	....
Aurora Tunnel	40c	....	70c	40c	1	60c	60c	50c
Baltimore Con	1.30	50c	75c	....	....	....	....	....
Belcher	6⅜	6¼	7	6¼	6⅜	6	6½	4.95
Belmont	65c	60c	30c	....	40c	35c	40c	....
Best & Belcher	19	17½	19½	17¾	19	17½	20	18
Bullion	8⅜	7¼	9½	7¼	8	7⅜	7⅜	6
Bechtel	2	1¾	2.15	1.65	2.30	1.95	2½	2
Belle Isle	1.55	1.35	1.70	1½	1.60	1.45	2½	1.65
Bodie	46½	38½	42	20½	24½	22½	22	20¾
Benton	7	6	6	4½	7¾	5¼	8¾	6½
Bulwer	12	10	10	9	10	9	9	....
Boyle	....	....	....	....	....	....	....	....
Black Hawk	2½	2	2.60	2.10	2.15	2	2	1¾
Belvidere	2.10	1⅞	1.90	1.60	1.95	1¾	1½	1
Booker	1	90c	1.60	1	1.40	1	1½	1.10
Caledonia	3.15	2.60	2.80	2½	2.60	2½	2.60	2¼
California	6⅜	5⅜	5⅜	5¼	5⅜	5¼	5	4¾
Challenge	3	2.85	3.05	2.90	2.95	2.80	2⅞	2¼
Chollar	8⅜	7⅜	9	7⅜	8⅞	7⅜	8	6¾
Confidence	15½	14½	16	14	16½	13½	12½	12
Con Imperial	2.20	1.70	2.20	1.80	1.90	1.70	1.95	1.60
Con Virginia	6½	5	5⅜	5¼	5⅜	5¼	5	4½
Crown Point	6	5⅜	5¼	4¾	4.80	4¼	5⅜	5
Con Washoe	40c	....	55c	45c	....	....	....	....
Champion	70c	50c	50c	40c	65c	60c	75c	55c
Concordia	....	....	....	....	....	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	10c	5c	5c	....	25c	5c	25c	....
Daney	....	....	....	....	....	....	....	....
Day	45c	40c	....	....	35c	30c	35c	30c
Eureka Con	17	15½	17	15½	17	16½	16½	15¾
Exchequer	9⅜	7½	9	7½	8	7⅝	7⅞	6⅜
Endowment	....	....	25c	....	35c	30c	35c	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	4.20	4	4.05	3.80	4	3½	3.90	3.80
Gila	80c	75c	1.55	90c	1.30	95c	1	1.15
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	14	....	15¾	....	14	....	13½	12
Goodshaw	80c	70c	70c	60c	....	....	80c	45c
Gould & Curry	12¼	11¾	13½	11¾	12¾	12	12¾	11¼
Hale & Norcross	17	15½	16½	15¾	18	16	17¼	14½
Hillside	2	1.90	1.90	1½	1¾	....	1¾	....
Highbridge	60c	25c	30c	....	25c	15c	25c	....
Homestake	....	....	....	....	....	....	....	....
Hussey	10c	5c	10c	5c	25c	20c	25c	20c
Independence	3.10	2.90	2.90	2.60	2½	2¼	2½	2¼
Julia	4.80	4.30	4.35	3.90	5.40	2¼	4¼	3¼
Justice	4.10	3¾	4.20	3¼	4.90	4	5⅛	4½
Jackson	6	5⅝	5⅛	....	5	....	5	....
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	5¼	5	5¼	5	5	4.60	4½	4
Kossuth	20c	15c	20c	15c	....	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	1.35	1.20	1⅜	1¼	1.30	1	1.40	1
Lady Wash	2.40	1.90	2.30	1¾	2.65	1.60	2.80	1¾
Leopard	1	....	1.20	1.05	1.10	1	1.20	90c
Leviathan	75c	70c	80c	70c	75c	70c	75c	65c
Leeds	1	70c	90c	75c	....	....	1	....
Lee	....	....	....	....	....	....	....	....
May Belle	40c	25c	75c	50c	70c	45c	50c	....
Modoc	1½	1	1½	1	....	....	....	....
Manhattan	3	2½	2¾	2½	3	2½	3	2¼
Martin White	6¾	6½	7	....	7	5½	6	5¾
McClinton	1.65	1½	1.60	1½	1½	1.40	1.40	1½
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	39½	33	32½	26½	27¾	26½	25¾	24
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	3	....	....	....	....	....
North Con Virginia	9	8	8⅞	8½	9½	9	9½	9
New York	1.15	60c	95c	65c	90c	65c	1.15	70c
Northern Belle	6⅜	5	6	5⅜	5⅜	....	5¼	5
New Coso	25c	....	20c	....	20c	....	....	....
Navajo	50c	45c	45c	40c	40c	25c	40c	30c
Occidental	1	75c	1	85c	1	80c	1	90c
Ophir	34½	32	35	31	31¾	30½	31½	29
Oriental	75c	50c	85	45	40c	25c	25c	....
Overman	13	11¼	12¼	10	11⅜	10½	11	9
Panther	....	....	....	....	....	....	....	....
Phenix	3½	3	3½	3½	3	2.90	3	....
Phil Sheridan	90c	60c	60c	65c	75c	60c	70c	....
Potosi	6½	5½	6⅜	5½	6	5½	5⅞	4½
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	4¾	4½	5¼	4½	4	....	4	3.90
Richer	75c	55c	85c	70c	1½	95c	1½	40c
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	16	14¾	17⅜	15	17	15½	15⅜	13½
Seg Belcher	28	24	....	....	....	....	....	....
Sierra Nevada	48	43	48	43½	46¾	43	41½	37
Silver Hill	2½	2	2½	1.80	2.20	1.60	2½	1¾
Silver King	8	....	7	....	8	7	8	7
Silver Prize	....	....	....	....	....	....	....	....
Succor	80c	50c	1½	5c	15c	10c	15	10
Summit	2½	2½	2.80	2	2½	2.30	3	2.65
Scorpion	2.90	2½	2.90	2½	2½	2	2.10	2
Solid Silver	45c	10c	45c	40c	45c	40c	40c	25c
South Bodie	45c	40c	45c	40c	45c	85c	40c	35c
South Standard	35c	25c	30c	25c	25c	20c	25c	20c
Star	40c	25c	40c	25c	40c	25c	50c	....
St. Louis	....	....	....	....	....	....	....	....
Syndicate	5½	4.90	7	6	8⅜	6	8¼	7½
Tioga Con	3.95	3¾	5¾	4.95	7⅞	6¼	6⅜	4.90
Tiptop	1½	1¼	1¼	1.15	1.15	1.10	1.10	1
Trojan	35c	25c	35c	25c	25c	....	25c	....
Union Con	79	63	61	43	45	40½	39	32
Utah	23	21½	22½	21	22	20	19	15¾
Vermont Con	....	....	....	....	....	....	....	....
Ward	1¾	1½	1.60	1½	1.65	1½	1.45	1⅜
Wells Fargo	25c	20c	20c	....	....	....	....	....
Woodville	40c	30c	50c	30c	30c	25c	50c	30c
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	20	16½	19⅜	17	17⅞	17	16¾	14½

Sales at S. F. Stock Exchange.

Monday A. M., July 7.

1685 Alta....12¼@11¾
100 Alpha....26
100 Atlantic....40c
1805 Andes....1½@1.40
320 Belcher....6¼@6⅛
730 Bullion....7⅜@7¼
3725 Benton....8¼@7⅞
570 Best & Belcher....19@20
465 California....4¾@5
500 Con Virginia....4.85@4½
330 Chollar....8@7⅞
140 Caledonia....2.40@2.30
495 C Dorado....2.15@2.45
1460 Con Imperial..1.90@1.95
135 Crown Point....5@5¼
700 Exchequer....7⅜@7¼
320 Flowery....50c
490 Gould & Curry...12⅜@12½
640 Hale & Nor....17@17¼
405 Julia....4¼@4.20
805 Justice....5@5½
70 Kentuck....4½
1495 Leviathan....75@70c
1195 Lady Wash....2.70@2.80
1290 Lady Bryan....1.05@1.15
560 Mexican....24@24½
100 Mountain View....2.40
235 Mackey....1¼
500 Margarita....35c
310 N Bonanza....1⅞@2.10
2170 New York....95c@1.15
335 North Con Vir....9
210 Overman....10@10½
270 Ophir....30@29
315 Occidental....90c@1
190 Potosi....5⅞
160 Phil Sheridan....70c
200 Solid Silver....40c
300 Scorpion....2
725 Savage....15@15⅜
435 Sierra Nevada....40@39
935 Silver Hill....2¼@2½
500 S Potosi....90c
500 S Utah....15@10c
20 Utah....19
740 Union Con....35¼@34½
380 Ward....1⅜@1.30
150 Woodville....50@45c
50 Yellow Jacket....16½

AFTERNOON SESSION.

1450 Adenda....65@45c
450 Aurora T....50@60c
220 Albion....30@25c
460 Argenta....85c@1
70 Bodie....20¾
2815 Bechtel....2@2¼
100 Bulwer....9
300 Black Hawk....1.90@2
50 Belvidere....1½
1455 Booker....1.10@1¼
2800 Belle Isle....1⅞@1.65
4380 Champion....55@75c
1025 Crœsus....25c
390 C Pacific....7⅞@7½
450 Day....35c
170 Defiance....2
870 Dudley....2¼@2
420 Eureka Con....16½@15⅞
500 Fourth July....75@80c
25 Giant & O A....6½
3850 Goodshaw....65@80c
100 Glynn Dale....60c
200 Gila....1.05
100 Grand Prize...3.90@3.80
100 Hussey....20c
160 Hillside....1⅞
1120 Independence....2½
160 Jackson....5
425 Jupiter....2.15@2
700 Leopard....1.20@1¼
345 Mono....10½@10½
760 Mammoth....9¾@10
100 May Belle....50c
250 Mt Diablo....3
710 McClinton....1.60@1.65
100 Manhattan....2¼
215 Northern Belle....5@5½
100 Navajo....30c
375 Noonday....4¾@4.90
300 N Noonday....2.60@2.65
2790 Orient....70c@1
100 Oriental....25c
925 Phenix....3
225 Paradise....1.60
750 Queen Bee....75c
800 Richer....1¼
305 Raymond & Ely....4
425 Red Cloud....90c@1
920 S Bodie....35@40c
370 Summit....2¾@3
70 Silver King....8
640 S Bulwer....1.20@1¼
455 Syndicate....8¼@8
850 South Standard....25c
150 Tiptop....1
1735 Tioga Con....5⅞@6⅜
800 University....55@50c
150 Vortex....75c
100 W Pacific....45c

Tuesday A. M., July 8.

2835 Alta....10@9
960 Andes....1¼@1.40
1650 Bullion....6½@6
310 Belcher....5⅞@5½
225 Best & Belcher....19@18½
2320 Benton....6½@6⅞
585 California....4.80@5
1690 Con Imperial..1.70@1.60
645 Crown Point....5@5¼
40 Confidence....12½
1050 Con Dorado...2.15@2.10
440 Con Virginia...4.55@4.60
30 Challenge....2½
380 Caledonia....2¼@2.60
170 Chollar....7¼@6⅞
1385 Exchequer....6⅜@6⅛
100 Flowery....60c
665 Gould & Curry....12@12¼
220 H & Norcross....15@14½
825 Justice....4.65@4½
430 Julia....3¼@3.30
125 Kentuck....4@4¼
300 Leviathan....70c
1925 L Bryan....1@1.20
360 Lady Wash....2@1.90
930 Mexican....22¾@22
200 Mackey....1¼
1130 New York....90@80c
1270 N Bonanza....2@2.20
600 North Con Vir....9
95 Overman....9½@9
290 Ophir....29
145 Occidental....90@95c
40 Phil Sheridan....70c
550 Potosi....4¾@4½
1000 Succor....15c
525 Solid Silver....40@25c
320 Sierra Nevada....38@37
340 Silver Hill....1.90@2
615 Savage....14@13½
240 Scorpion....2
100 S Potosi....90c
1500 S Utah....15c
150 Trojan....25c
190 Utah....16½@15¾
1295 Union Con....32¼@32
295 Ward....1½@1.20
400 Woodville....40@45c
155 Yellow Jacket...14½@14¼

AFTERNOON SESSION.

875 Argenta....95c@1
600 Addenda....60@50c
600 Albion....30c
350 Aurora T....60@55c
60 Bulwer....9
1410 Booker....1¾@1.10
180 Black Hawk....1⅜@1.80
700 Belvidere....1
425 Bodie....21
1165 Belle Isle....1.85@1.95
625 Bechtel....2.15@2.10
2170 Champion....65@70c
200 Caledonia (B H)....2¼
1150 Crœsus....25@20c
275 O Pacific....7⅞@7½
950 D Standard....1@1.30
500 Defiance....1.90
830 Dudley....2¼@2
50 DeFrees....25c
550 Day....35@30c
190 Eureka Con....15¾@16
100 Endowment....35c
100 Fourth of July....75c
50 Golden Terra....13½
25 Giant & O A....6½
1400 Gila....1.05@1
900 Glynn Dale....60@50c
240 Grand Prize....3.90
350 Goodshaw....55@50c
290 Hillside....1⅞
200 Hussey....20c
2250 Independence....2¼@2¼
1090 Jupiter....1⅞@1.90
400 Leeds....1
450 Leopard....1⅛@1.15
325 May Belle....50c
165 Mono....9½@9⅜
735 Martin White....6@5⅞
1395 Mammoth....10@10½
770 McClinton....1½@1.40
550 Manhattan....2.90
200 Mt Diablo....3
540 Noonday....4½@4.60
100 Navajo....35@40c
155 Northern Belle....5
1350 N Noonday....2½@2.90
100 Oriental....25c
2300 Orient....60@80c
830 Paradise....1.60@1.70
800 Queen Bee....75c
175 Raymond & Ely....4
380 Richer....75@40c
300 Red Cloud....85@80c
580 Summit....3@2.90
45 Silver King....7
845 S Bulwer....90@75c
1400 S Standard....20@25c
900 S Bodie....35@40c
475 Syndicate....7½
1565 Tioga....4.90@5
50 Tiptop....1.05
150 University....50@60c
900 Vortex....75c
350 W Pacific....45@60c
120 Wales....3

Wed'sday A. M., July 9.

610 Andes....1¼@1.40
40 Alpha....2 @25½
1110 Alta....9¼@9
845 Bullion....7¼@7
225 Belcher....5⅞@5⅝
1015 Benton....6¾@6⅞
95 Best & Belcher...18¼@18½
135 California....4.90@5
305 Crown Point....5¼@5⅝
90 Confidence....12½@12¼
1280 Con Dorado....2¼@2.10
665 Con Virginia....4.95@5
130 Chollar....7
360 Caledonia....2½@2.40
380 Con Imperial....1⅝
100 Challenge....2⅞
955 Exchequer....7@6⅜
630 Flowery....80@50c
675 Gould & Curry....12@11⅞
120 Hale & Nor....15@14⅞
400 Julia....3.60@3.70
445 Justice....4¾@4.70
25 Kentuck....4.20
480 Lady Bryan....1.30@1¼
100 Leviathan....70c
1335 Lady Wash....1⅞@1.95
500 Mexican....25@24⅜
260 Mackey....1.30@1¼
105 North Con Vir....9
2225 New York....70@80c
905 N Bonanza....2.05@1⅞
315 Ophir....31½@31¼
65 Overman....11
50 Occidental....95c
200 Potosi....5½@5
1275 Succor....10c
225 Sierra Nevada....40@39½
200 Silver Hill....1.95@2
230 Savage....13⅜
400 S Utah....15c
500 Solid Silver....35c
315 Scorpion....2@2.10
125 Trojan....25c
275 Utah....18@19
485 Union Con....36½@33
1090 Ward....1.20@1⅜
100 Woodville....40c
440 Yellow Jacket....16@16⅜

AFTERNOON SESSION.

40 Argenta....1
380 Albion....30@25c
1300 Addenda....60@55c
100 Aurora....70c
150 Bodie....22@21⅜
560 Bechtel....2.15@2.10
2380 Belle Isle....2½@2.40
50 Belmont....40c
840 Booker....1¼@1.20
85 Black Hawk....1⅞@1.80
15 Bulwer....9
3180 Belvidere....1@1.10
400 Champion....65c
250 C Pacific....7⅞@7½
1375 Crœsus....15@25c
200 Caledonia (BH)....2¼@2⅜
200 Day....30c
570 D Standard....1
1025 Dudley....1.90@2
350 Defiance....1.80@1⅞
200 Endowment....35c
10 Eureka Con....15⅞
820 Gila....1.15@1.10
20 Golden Terra....12
650 Glynn Dale....50c
2200 Goodshaw....50@45c
100 Highbridge....25c
70 Hillside....1⅞
900 Hussey....25c
2000 Hamburg....50c
1020 Independence..2.30@2.45
600 Jupiter....1.90@1.80
1350 Leopard....90c@1
525 Leeds....1
35 Martin White....6
420 McClinton....1.40@1½
550 May Belle....50c
100 Manhattan....2.95@3
65 Mammoth....9⅜
50 Mono....9⅜
350 Navajo....35c
165 Northern Belle....5
825 Noonday....4¾@4½
485 N Noonday....2¾@2.90
1600 Orient....75@90c
500 Oriental....25c
300 Phenix....3
50 Paradise....1.60
200 Queen Bee....70c
350 Richer....1@1.10
330 Raymond & E...3.90@3.95
275 Red Cloud....75@70c
145 Star....50c
330 Summit....2.90@2.65
125 Syndicate....7⅞
730 S Bulwer....1.10@1.30
700 S Standard....25@20c
200 S Bodie....40c
25 Tuscarora....15c
85 Tiptep....1.05@1.10
3725 Tioga Con....5¼@5⅞
250 University....50@55c
310 Vortex....75@90c
75 W Pacific....50c

SALES OF LAST WEEK AND THIS COMPARED

Wed'sdny A. M., July 2.

1450 Andes....1½@1.40
1540 Alta....10⅞@10
155 Alpha....28@27
350 Belcher....6¼@6⅜
240 B & Belcher....18⅞@19
1055 Bullion....7⅜@7⅜
1520 Benton....7½@7¼
625 California....5⅜
400 Crown Point...4.70@4.65
680 Chollar....8@7⅞
450 Con Virginia....5⅜@5½
2050 Con Imperial....1⅞
100 Challenge....2.80
420 Caledonia....2½
50 Confidence....13½
1900 Con Dorado...1.90@2.10
140 Exchequer....7½@7⅝
500 Flowery....60@55c
410 Gould & Curry...12½@12⅜
130 Hale & Nor....17@17¼
460 Justice....4.70@4.90
125 Julia....4.45@5.40
10 Kentuck....4.60
100 Leviathan....75c
575 Lady Bryan....1.10@1
985 Lady Wash....2.80@2.60
125 Mexican....27½@27¼
150 Mt View....2.40@2.30
300 Mackey....1¼
405 N Bonanza....1¾
500 New York....90@85c
125 North Con Vir....9
50 Occidental....1
30 Overman....11
290 Ophir....30½@31
500 Potosi....5½
380 Savage....15¼@15⅜
540 Sierra Nevada....44¼@44
190 Silver Hill....2.20@2.10
575 Succor....10@15c
150 Solid Silver....40c
120 Scorpion....2⅜@2
600 S Utah....15c
300 S Potosi....85c
300 Trojan....25c
80 Utah....20@20¼
625 Union....40½@41
730 Ward....1½@1.55
215 Yellow Jacket...17⅜@17½

AFTERNOON SESSION.

500 Albion....30c
200 Aurora T....60c
430 Argenta....1
160 Bodie....23½@23¼
1715 Bechtel....2.15@2.30
150 Belvidere....1⅞
1100 Booker....1.10@1
50 Bulwer....9½
2600 Belle Isle....1.60
500 Champion....65@55c
300 Crœsus....30@35c
250 Con Pacific....7⅞
325 Defiance....1.90
265 Dudley....2.30
15 Eureka Con....16½
1100 Gila....90c@1
1030 Grand Prize....4
200 Hamburg....55c
100 Hillside....1⅞
870 Independence....2¼
250 Jupiter....2¼
50 Mammoth....10½
420 M White....6
190 Mono....11⅛
450 May Belle....66@65c
100 McClinton....1.60
20 Manhattan....2⅛
220 Modoc....1
150 New Coso....15c
100 Navajo....30c
275 Northern Belle....5
300 N Noonday....2½
300 Noonday....4.85@4¾
2000 Orient....75@65c
100 Paradise....1.60
1175 Queen Bee....60@65c
50 Richer....1.40
150 Red Cloud....95@90c
120 Raymond & Ely....4¼
425 Summit....2.30@2¼
100 Syndicate....8
150 Star....40c
200 South Standard....25c
800 S Bodie....35@40c
50 Silver King....7½
300 S Bulwer....1.10@1½
1955 Tioga Con....7@6⅞
250 Tiptop....1
850 W Pacific....50c

Thursday A. M., July 10.

335 Alpha....28@27
850 Alta....9⅞@9¼
1215 Andes....1¼@1.15
105 Best & Belcher....16
915 Bullion....6⅞@6½
755 Belcher....5@4.95
1080 Benton....6½@6⅜
120 California....4.90@4.95
199 Con Virginia....4.85@5
760 Chollar....7@6⅞
1070 Crown Point....5@5⅛
1650 Con Imperial....1⅝@1.80
230 Confidence....12@12½
235 Caledonia....2.45@2.40
210 Challenge....2½
650 C Dorado....2.10
895 Exchequer....6½@6⅜
1490 Flowery....50c
640 Gould & Curry...11⅞@11½
30 Hale & Nor....14⅞
290 Justice....4.70@4.65
505 Julia....3⅞@3.80
120 Kossuth....4¼
1185 L Bryan....1¼@1.40
300 Lady Wash....1.80@1.85
110 Leviathan....65@70c
240 Mexican....25⅞@25½
100 Mt View....2.40@2½
100 Mackey....1.30@1¼
800 New York....75@80c
135 N Con Vir....9@9½
675 N Bonanza....1⅞@1.70
180 Ophir....31@31¼
125 Overman....9⅞@9⅜
270 Potosi....5@4.90
375 Savage....13⅞@13⅜
495 Sierra Nevada....40@41½
100 Succor....10c
300 Silver Hill....1⅞@1.80
800 Solid Silver....30c
160 Scorpion....2@2.10
200 S Potosi....90@85c
350 S Utah....15c
50 Trojan....25c
130 Utah....18½@18
325 Union Con....39@38
310 Woodville....40@30c
800 Ward....1.45
225 Yellow Jacket....15½

AFTERNOON SESSION.

550 Argenta....95c@1
830 Albion....30c
300 Aurora T....50@60c
1300 Addenda....60@55c
480 Booker....1.15@1.10
65 Bulwer....8⅜@8
725 Bodie....21@21¼
810 Bechtel....2.15@2.10
300 Belvidere....1.40
2570 Belle Isle....2½@2.60
1870 Black Hawk....1¾@1.80
230 Belmont....40c
300 Caledonia (B H)....3
100 Crœsus....20c
3675 Champion....50@65c
105 C Pacific....7½@7⅞
350 D Standard....1
350 Defiance....1.60@1¼
660 Dudley....1.60@1⅞
500 Endowment....35c
405 Eureka Con....15@15¼
50 Golden Terra....13
1400 Goodshaw....50@40c
50 Glynn Dale....50c
160 Grand Prize....3.90@3½
1040 Gila....1.20@1
200 Hussey....25c
65 Hamburg....50c
300 Hillside....1⅞
1330 Independence...2.30@2½
120 Jackson....4¾
805 Jupiter....2
1210 Leopard....1@1.10
50 Leeds....1
270 Mammoth....10
400 May Belle....50c
330 Mono....9⅜@9½
200 McClinton....1.60@1.55
290 Mt Diablo....3
1230 Manhattan....3@2.90
160 Northern Belle....4¾
400 Navajo....45@50c
1800 Orient....90@80c
800 Oriental....25c
200 Phenix....3
200 Queen Bee....50@60c
500 Richer....90@70c
155 Raymond & Ely..4@3.90
220 Red Cloud....50@70c
870 Star....50@60c
1090 Summit....2¼@2⅝
100 Silver King....7½
650 S Standard....25@20c
465 S Bodie....35@40c
600 S Bulwer....1¼
90 Syndicate....7⅞
50 Tiptop....90c
675 Tioga Con....5⅞@5⅜
950 University....70@65c
270 Vortex....80@70c
200 Wales....3¼@3½

Pacific Board—Latest Sales.

Wed'sday A. M., July 9.

70 Alta....9¼
55 Andes....1¼@1.30
10 Best & Belcher....18½
270 Bullion....7@7¼
80 Benton....6⅞@6⅞
60 Belcher....5⅞
100 Crown Point....5¼
450 Con Imperial....1⅞@1.80
90 Con Virginia....5@4.90
140 Chollar....7
50 Exchequer....7½@7½
10 Gould & Curry....12
25 Hale & Nor....14⅞@15
60 Justice....4.60@4.65
10 Julia....3½
15 Mexican....25¼@2[illegible]
40 Ophir....31@31¾
70 Potosi....4⅝@4¼
50 Silver Hill....2.10
10 Savage....14¼
200 Tiger (B)....75c
120 Union....35@35½
30 Yellow Jacket...15¼@16¼

AFTERNOON SESSION.

50 Andes....1.30
50 Benton....7½
110 Belcher....5⅞@5⅝
360 Bullion....7⅜@7¼
10 Bodie....21½
25 Best & Belcher....19
100 Con Virginia...4.90@4.95
20 Confidence....13@13½
85 Crown Point....5.40@5½
300 Con Imperial....1.70@1⅝
50 Chollar....7½
20 Exchequer....7½
30 Gould & Curry...12½@12⅜
100 Julia....3¾
60 Justice....4.85@5
100 N Standard....2
40 Ophir....32¾@32
10 Overman....10½
70 Potosi....5¼
400 S Utah....14c
220 Silver Hill....2.05@2
20 Sierra Nevada....42@42½
50 Summit....2.80
210 Tioga Con....5⅞@5⅝
10 Union Con....41
300 Walker....70@60c
240 Ward....1.36
20 Yellow Jacket....16⅞

California Board—Latest Sales.

Wed'sday A. M., July 9.

20 Alpha....25½@25¼
40 Alta....9⅞@9⅜
105 Andes....1¼
10 Ætna (N)....5
300 Atlantic....50c
40 Belcher....6
40 Bullion....6⅞@7
60 California....5@4.90
40 Con Virginia..4.80@4.65
200 Con Imperial....1.70@1⅝
40 Crown Point....5¼@5⅝
300 Con Washoe....50@30c
40 Caledonia....2.40@2.45
200 Coso Con....7@6c
40 Exchequer....7½@7¼
40 Gould & Curry...12½@12¼
40 Julia....3⅞
40 Justice....4.70@4¾
40 Mexican....25½@25¼
100 Mint....16c
100 Monumental....3c
40 Ophir....32@32¼
300 Orient....75@70c
40 Savage....14½@14¼
40 Sierra Nevada...39½@39¼
200 S Utah....13c
100 Succor....12½c
20 Union Con....37@37½
200 Wm Penn....30c
20 Yellow Jacket...15@15½

AFTERNOON SESSION.

20 Alpha....30
40 Alta....9⅞@9⅜
800 Atlantic....45@55c
350 Ætna (N)....5½
200 Ætna (A)....45c
200 Andes....1⅛@1.35
50 Almaden Q....1½
10 Belcher....5⅝
50 Best & Belcher...18⅞@18⅝
50 Bullion....7⅛
60 California....6@5.05
40 Con Virginia....5
1750 Con Imperial..1.80@1.90
40 Crown Point....5
40 Chollar....7@7½
255 Caledonia....2½@2 55
100 Coso Con....8c
40 Exchequer....7⅞@7⅞
250 Enterprise....1¼
100 Gila....1
30 Gould & Curry...12½@12¼
100 Goodshaw....55c
50 Julia....3.80@3.85
40 Justice....4.95
850 Kossuth....17@22c
30 Mexican....28@28½
100 Newark....15c
50 Ophir....33@33½
100 Orient....75c
40 Potosi....5½
30 Sierra Nevada....42@42½
500 S Utah....15@12c
250 Trojan....23@24c
200 Tiger (B)....75c
20 Union Con....43½@43¼
20 Yellow Jacket....17⅞

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alta S M Co	Nevada	15	1 00	June 12	July 17	Aug 4	W H Watson	302 Montgomery st
Amazon Con M Co	Nevada	6	10	Mar 24	June 11	July 31	———	12 Cosmopolitan Hotel
Belcher S M Co	Nevada	18	1 00	May 20	June 25	July 15	Jno Crockett	203 Bush st
Belvidere M Co	California	4	25	July 9	Aug 11	Sept 6	O V Hubbard	203 Bush st
Booker Con G M Co	California	3	50	June 30	Aug 4	Aug 25	W H Lent	309 Montgomery st
Brilliant M Co	Nevada	3	10	May 19	June 23	July 14	H S Stone	419 California st
Bullion M Co	Nevada	10	1 50	July 9	Aug 13	Sept 3	J Gruss	418 California st
Commonwealth Con M Co	Nevada	1	25	June 27	July 31	Aug 20	C A Morse	217 Sansome st
Crown Point G & S M Co	Nevada	37	1 00	June 4	July 11	July 29	Jas Newlands	203 Bush st
DeFrees M & M Co	Nevada	10	15	May 29	June 28	July 18	T E Atkinson	318 Pine st
Exchequer M Co	Nevada	14	1 50	July 9	Aug 15	Sept 5	J Gruss	418 California st
Gila M Co	Nevada	4	20	Apr 30	June 3	July 14	———	328 Montgomery st
Goodshaw M Co	California	4	25	July 9	Aug 23	Sept 30	V Fernbach	327 Pine st
Hussey Con G & S M Co	Nevada	8	15	May 27	July 1	July 22	Jno E Dixon	327 Pine st
Jupiter M Co	California	4	25	July 5	Aug 11	Sept 4	E C Masten	22 Nevada Block
Justice M Co	Nevada	28	1 00	May 26	June 30	July 19	R E Kelley	419 California st
Leopard M Co	Nevada	11	50	June 11	July 15	Aug 5	J E Dixon	20 S F Stock Ex
Mexican G & S M Co	Nevada	6	1 00	May 14	June 18	July 10	C L McCoy	203 Bush st
N Comstock S M Co	Nevada	1	05	May 30	July 2	July 23	D L Thomas	203 Bush st
N Noonday M Co	California	2	25	June 5	July 14	Aug 18	G A Holden	310 Pine st
Real Del Monte M Co	Nevada	7	1 00	June 10	July 19	Aug 11	C V D Hubbard	203 Bush st
Sierra Nevada S M Co	Nevada	58	3 00	June 12	July 16	Aug 5	W W Stetson	309 Montgomery st
Star M Co	Nevada	2	20	June 3	July 15	Aug 11	———	320 Sansome st
Summit G M Co	California	2	50	June 5	July 10	July 31	W H Lent	309 Montgomery st
Tioga Con M Co	California	6	25	June 19	July 21	Aug 6	W H Lent	309 Montgomery a
Union Con S M Co	Nevada	13	2 00	June 4	July 7	July 24	J M Buffington	309 California st
University G M Co	California	2	10	June 9	July 14	Aug 4	W Letts Oliver	328 Montgomery st
Ward G & S M Co	Nevada	4	50	July 2	Aug 7	Aug 27	J Stadtfeldt, Jr	26 Haywards Build

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Adams Hill Con M Co	Nevada	10	10	May 19	July 1	July 22	———	401 California st
Addenda G & S M Co	California	1	20	July 2	Aug 7	Aug 28	T H Dixon	238 Montgomery st
Ajax G & S M Co	California	2	10	June 11	July 14	Aug 1	A F Main	309 California st
Allison Ranch Ford G M Co	Cal	—	01	June 16	July 18	Aug 4	J E Carr	Grass Valley
Armand G & S M Co	California	1	10	June 9	July 28	Aug 25	J L Fields	240 Montgomery st
Armstrong G M Co	California	1	05	June 11	July 14	Aug 1	J W Pew	310 Pine st
Black Hawk G M Co	California	6	50	July 1	Aug 4	Aug 25	H A Charles	21 Haywards Build
Crœsus G & S M Co	California	1	05	June 16	July 21	Aug 14	E Hestres	328 Montgomery st
Dudley M Co	California	4	25	June 12	July 16	Aug 11	E C Masten	22 Nevada Block
Emigrant S M Co	California	4	50	May 10	July 3	July 23	S W Mudge	309 Montgomery st
Fall Creek M Co	California	3	40	June 11	July 22	Aug 14	C Robinson	310 Pine st
Giant and Old Abe M Co	California	1	50	June 4	July 15	Aug 14	———	49 Nevada Block
Gover M & M Co	California	38	50	May 21	July 1	Aug 11	W O Wilson	402 Front st
Hartford S M Co	California	1	50	June 18	July 21	Aug 13	S Heringhi	422 Montgomery st
Ida M Co	———	1	25	June 19	July 21	Aug 6	———	324 Pine st
Leo M Co	Nevada	5	50	June 14	July 18	Aug 8	J J Scoville	59 Nevada Block
Mayflower Grav M Co	California	5	10	June 17	July 22	Aug 8	J Morizio	328 Montgomery st
Mono G M Co	California	4	50	June 21	July 28	Aug 18	W H Lent	309 Montgomery st
Numa M Co	Nevada	1	03	June 13	July 24	Aug 11	D Wilder	328 Montgomery st
Oriental Con G & S M Co	California	3	25	June 25	July 25	Aug 11	H O Hinman	411 California st
Oroville Grav M Co	California	2	10	May 31	June 30	July 18	J T McGeoghegan	318 Pine st
Planet Grav M Co	California	—	02	May 19	June 21	July 15	M Byrne, Jr	Grass Valley
Rocky Bar G M Co	California	1	10	May 26	June 28	July 15	G W Hill	Grass Valley
Rustler G M Co	California	1	10	June 30	Aug 4	Aug 25	A F Main	309 California st
Seg Europa M Co	Nevada	1	25	Apr 4	July 15	Aug 2	R B Noyes	240 Montgomery st
Silver State M Co	Nevada	10	06	May 20	June 24	July 22	A Halsey	314 Montgomery st
Swansea M Co	California	1	10	June 14	July 21	Aug 11	F N Delaney	315 California st
Tellurium G & S M Co	California	18	10	May 29	July 5	July 31	J M Litchfield	415 Montgomery st
Union G & S M Co	California	20	05	June 9	July 10	July 26	R Vincent	Grass Valley
Wide Awake M & P Co	Arizona	7	02	June 23	Aug 1	Sept 1	O Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Best & Belcher M Co	Nevada	W Willis	309 Montgomery st	Annual	July 14
Bohemia M Co	———	J Klein	121 Sansome st	Annual	July 21
Savage M Co	Nevada	E B Holmes	309 Montgomery st	Annual	July 17
Union Con S M Co	Nevada	J M Buffington	309 California st	Annual	July 21
Yellow Jacket S M Co	Nevada	M Otey	Gold Hill, Nev	Annual	July 21

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
California M Co	Nevada	C P Gordon	23 Nevada Block	50	June 17
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	50	June 16
Excelsior W & M Co	California	G P Thurston	315 California st	25	Apr 21
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	1 00	May 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	Apr 30
Standard Con M Co	California	W Willis	309 Montgomery st	50	Apr 12
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	30	May 27

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Martin White, July 6th, $8,544.75; Northern Belle, July 2d, $2,580.78; Eagle, July 7th, $3,570; Ophir, July 5th, $37,256.63; Belle Isle, July 7th, $39,000; Independence, July 7th, $15,000; Christy Con., July 2d, $10,013; Northern Belle, June 30th, $2,889.08; Standard, June 30th, $20,978.84; Indian Queen, June 30th, $4,136.20; Sierra Nevada, July 1st, $50,023.90.

The proprietor of the Pullman car invention reports that paper wheels have run 400,000 miles under his cars without repair, while the average running power of an ordinary wheel is from 55,000 to 60,000 miles.

A wonderful cave has been discovered near La Crosse, Wis., on the farm of David Samuels. It is 30 feet long by 8 wide, and its walls are covered with hieroglyphics and rude carvings of men, animals and various Indian implements.

The Mining Share Market.

The local market for mining shares continues weak and wobbling, a condition that may justly be pronounced unsatisfactory all round. Indeed, the business seems, just now, sadly demoralized, what, with the total suspension of dividends on the Comstock, the tardy developments at expectant points and the low grade of the ores now being raised from the few producing mines left on the great Washoe lode, having overwhelmed with disappointment the whole army of dealers, leaving all in doubt as to what will come next. The benefits to accrue from the completion of the Sutro tunnel had been discounted so far in advance that their effect is no longer felt. The find in Union Con. having shrunken on its first dimensions, the output from Sierra Nevada continuing restricted and the Bonanza ores tending to a lower grade, nothing else than stagnation and gloom could be looked for; the more, that money with the many is tight, politics rage and times are far from promising. No wonder then the mining share market is lifeless, prices depressed, "and the mourners go about the streets." The recent spurt in Alta has already subsided—was brilliant but evanescent, going up, like the Fourth of July rocket, a blazing meteor and coming down a blackened stick. Even the much-talked-of stir in the New York mining share market does not appear to blaze up according to expectation. The thing sizzles and spits, but fails to ascend with those glorious coruscations that so gladden the stock dealer's heart. In this untoward state of things there is this consolation: What the manipulators fail to make the masses fail to loose, showing how largely the compensating principle enters into the affairs of human life. But the manipulator is not discouraged. He knows well the habit of these dabblers in stocks, and that, after a brief season of financial recuperation, they will return to the gamble, affording him a chance to clean them out in the end.

An Important Decison.

The Secretary of the Interior has announced a decision reversing the decision of the Commissioner of the General Land Office in the case of the Iowa mining company versus the Bonanza mining company of Nevada, and laying down a new principle of great importance in mining controversies. The Bonanza company, in January, 1876, made application for 593 feet of the Lucky Baldwin lode. The Iowa company holding an adverse claim, commenced suit thereon in April, 1876, by filing a complaint in the First District Court of Nevada, and causing summons to be issued. It was shown, however, that as late as May 24th, 1878, service had not been perfected on the defendant, and that no further steps had been taken by the plaintiff in the prosecution of said suit. The General Land Office, on this state of facts, decided, last October, that the Iowa company had waived its adverse claim by failure to prosecute said suit with reasonable diligence, and that the Bonanza company was therefore entitled to receive a patent as soon as the ordinary requirements of the mining law should be complied with.

Secretary Schurz, reviewing this decision, says: "Section 2326 of the revised statutes provides in plain terms that a failure on the part of an adverse claimant to prosecute his suit to judgment with reasonable diligence, shall be a waiver of his claim, but it does not provide either in terms or necessary implication that the General Land Office shall decide what constitutes 'reasonable diligence' while the suit is pending in Court. The object of this law clearly was to require parties claiming an adverse interest in land included in an application for patent, to try the right of possession and have the controversy determined by the State Courts before any issuance of a patent. The question of diligence in the prosecution of a pending suit is as much a question for the determination of the Court as any other question of law or fact which may arise in the progress of the case, and one which, after the Court has acquired jurisdiction, should be left for its determination."

The Secretary points out that otherwise the General Land Office might hold that reasonable diligence had not been exercised, and issue a patent, while the Court might give judgment for the adverse claimant, thereby producing conflict of authority and confusion of titles, and, as a consequence, further expensive litigation, etc. He therefore says:

"I am of opinion that the proper practice in cases of this character is for the defendant, if, in his opinion, the suit is not prosecuted with reasonable diligence, to move the Court to dismiss the case for want of prosecution, and if the motion is granted, cause the judgment to be certified to the General Land Office, when a patent can be issued without conflict with the jurisdiction of Courts or the rights of parties in interest."

THE *Jeannette* Bennett's Polar steamer left on her voyage Tuesday, July 8th, escorted to the ocean by the yacht fleet and numerous tugs—receiving from the fort a salute. She will float on the Japanese and Polar currents from Behring's strait to Davis strait.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

FRMS. - *Dispatch*, July 5: The miners on Mule creek are said to be complaining of the scarcity of water for mining purposes in that locality. We learn that the Ffarmon Bros. had about 40 tons of rock, taken from their mine above Volcano, crushed at Mace's mill last week, which yielded the neat little sum of $2,000, or an average of about $50 per ton. The new hoisting works at the Butte Basin mine, at Butte City, have been completed, and will be put in active operation next Monday. The machinery will be run by water power. A fresh body of good rock was struck in the Oneida mine a few days ago. The ledge was struck in the lower drift. The shaft of the Moore mine is being widened.

BUTTE.

ARMSTRONG MINE.—*Mercury*, July 4: This property is located about three miles south of Boston ranch. A company of San Francisco capitalists purchased the ledge about three months since, and have had three men at work ever since opening the mine. One tunnel has been run in a distance of 160 ft, and work was begun on another one last Friday. Thus far the assays of the rock have been very satisfactory, and it is very likely that a mill will be put in operation before the fall.

BIG CLEAN-UP.—The Sunnyside mine, situated near the Colyer mine, made a big clean-up a few days ago, the rock averaging $60 per ton.

INYO

MODOC CON.—*Independent*, June 28: Progress on the 1000 level for the week ending June 24th, is as follows: Tunnel run 48 ft; total length, 1,784 ft. Drift, 300 ft, run 8 ft; total length, 109 ft. Drift, 1,000 ft, run 8 ft; total length, 67 ft. Drift, 1,100 ft, run 17 ft; whole length, 50 ft. Face of main tunnel is in good ground, with some manganese and crystallized lime in face.

MINNIEATTA.—The Minnieatta mine, at Lookout, now the property of Messrs. Belshaw & Beaudry, is likely to be started up on the several hundred tons of tailings from old workings. George Center, of Darwin, has lately been over there making assays. The last run on Minnieatta ore at the New Coso furnace, about 60 tons, resulted in a yield of between $6,000 and $7,000.

THE UNCLE ABE.—We have heard but little about this mine for some time past, but the owners, Dodge & Hitchcock, have not been lying quiet by any means. They have run their lower tunnel in a distance of 300 ft, and have now exposed, to the view of any man who desires to go and see it, a streak of splendid ore, showing without a break for a depth of 170 ft. This ore carries considerable base, and it is likely a hundred tons or so of it will be brought to the Rex Montis mill for reduction.

SILVER PEAK.—From A. J. or "Jeff" Davis, who is just in from Silver Peak, we learn that the old camp is steadily progressing. Superintendent Bronson has been running the mill upon some 200 tons of gold ore, with fine results. A force of eight or ten men is being worked at the company's old silver mines, and a smaller number on the gold ledges. The company are about putting up a new mill at Gold springs, about seven miles from the present one.

A PAYING MINE.—Messrs. Cardes, Meier and Schroeder have been operating upon a little mine in Alabama district for some three months, and making it pay right along. They do everything within themselves, using an arrastra for reducing their ores. Their second clean-up for this month yielded 43.63 ounces gold, worth $13.50 an ounce, making $575.50 in all. Their shaft is down about 40 ft. They are favored in the peculiarity that they have never yet had to put in a single blast, the pick and sledge being all sufficient without powder.

MONO.

ITEMS.—*Standard*, July 3: A tunnel has been run in the first location of the True Blue 30 ft, into a solid mass of ore. The surface ore assays $40 per ton. The True Blue tunnel site is located 1,200 ft southerly and 2,000 ft from the proposed Mammoth tunnel. The ledge dips in the direction of the proposed tunnels. In the Noonday the ledge, so far as explored, holds out quite regularly and satisfactorily, from three to five ft in width and of $20 to $35 ore. The ore carries gold chiefly, and has that general lively appearance characteristic of the big ledge now attracting so much attention in the Standard ground.

INDIAN QUEEN MINE.—During the past year, over 2,500 linear ft have been driven on the fissure, in the extension of tunnels, winzes and crosscuts. In making these developments, 1,300 tons of ore have been extracted and milled, the assay value of which has averaged about $121 per ton, making the gross value of the ores $157,360. The bullion shipments aggregate about $150,000, showing a working of the ores up to 95%. Prospecting will be confined to tunnel No. 5, which has been extended 150 ft on the vein.

THE ONEOTA.—This mine is located about half a mile north of the Indian Queen, and on the same fissure. The company is now running a 400-ft tunnel to tap the vein. This tunnel has now about 80 ft to go to intersect the ore body. The owners of many adjoining claims are awaiting the issue of the Oneota, and should a bonanza be developed, work on them will be pushed vigorously, and perhaps another Chicago excitement inaugurated.

ITEMS.—Bodie *News*, July 6: Some time ago the Sandbank, a claim located on Silver hill, directly east from the Noonday, was bonded to Jeremiah Miller, President of the South Bulwer company here. We are informed by the owners of the property that it has been sold to San Francisco parties and the money paid. This mine has been opened by an incline shaft run down on the vein, disclosing a fine body of quartz, bearing ore of considerable richness and extent as far as developed.

UNIVERSITY.—East crosscut on 328 level is in 150 ft, formation hard porphyry, carrying seams of clay. South drift is in 63 ft in fine quartz.

RICHER.—East drift on 250 level is in 63 ft; west drift, 26 ft. The work is in fair ground.

MONO.—A new set of timbers is being placed in main shaft.

NOONDAY.—North drift on 200 level is in good milling ore. Winze on 300 level is down 10 ft in a three-ft ledge assaying $60.

SOUTH BODIE.—East crosscut now in 150 ft from main shaft at the 500 level.

NORTH STANDARD.—Several small stringers of quartz prospecting well in gold are met in the double-compartment shaft.

ADDENDA.—West crosscut from north drift is in 32 ft. South drift, 460 level, has advanced from main shaft 132 ft. A small flow of water coming in on face of south drift.

ROUGH AND READY.—Shaft down 16 ft in ledge two ft wide, assaying $60. Drifting on ledge will be commenced at a depth of 200 ft.

MCCLINTON.—Water has forced the men out of lower level. Work is concentrated on 500 level and new shaft 700 ft north to be sunk.

ITEMS.—Bodie *Chronicle*: A 30-stamp mill is in process of erection by Malter & Lind, of San Francisco, for the Noonday and North Noonday mining companies. The engines are Corliss. The Standard, Bulwer and Bodie have millions in sight. The extreme workings of the Bodie, as to depth, were hampered by water for a few days, but a cheap pumping apparatus was obtained from Aurora and work of sinking deeper resumed on Thursday. The extreme bottom of winze on lower level was never looking better. Tioga and Jupiter are pushing down their main shafts as rapidly as possible; ditto Noonday, and all are drifting and crosscutting as usual. Mono is also sinking main shaft with lightning speed, and running the east joint crosscut accordingly, the formation being most favorable for obtaining a slice of the Bodie bonanza. The Syndicate will soon have connection completed between the mill, tunnel and ledges, and be independent of other companies' ores. The Dudley is sacking up rich ore in considerable quantities and is only waiting the arrival of steam pumps to resume sinking the main shaft. Con. Pacific will soon be sinking their main shaft with steam power. The Standard is rushing up the big pump, so that crosscutting on the 700 level can be resumed, and also sinking main shaft to greater depths. The Booker will get up steam next any day now and have their big pump running preparatory to greater depths. All four mills are running to their full capacity, and two new mills are projected. The first bar of bullion from the Standard was shipped in April, 1877, and from that time down to June 25th, 1879, the mine produced and shipped $2,366,771, of which $1,300,000 was paid over to stockholders in dividends. It is said there is enough ore in sight to keep the mill in operation for two years more. The first bar from the Bodie mine was shipped in July, 1878, and from that time down to June 25th, 1879, the mine has produced $1,242,712, and paid $800,000 in dividends to stockholders. This mine has recently renewed its lease of bullion-bearing rock, and bids fair to yield handsomely for some time. It is said that Mono county has given $4,000,000 to the world since the renewal of operations at that camp in April, 1878.

NEVADA.

ITEMS.—*Foothill Tidings*, July 5: The Round Mountain company have struck large boulders, and are near the main channel. The Derbec has about 1,000 tons of good looking gravel on the dump.

NEW YORK HILL.—Grass Valley *Union*, July 2: Ford, Mullen & Co., have of late been sinking a new shaft on the McDonald & Mullen ground, on New York hill, and on Saturday last, at the depth of 90 ft, they struck a stringer of very rich quartz, scarcely a piece of which but shows finely in free gold. The boys regard the strike as a valuable one, and from the appearance of the rock taken out, they have good reason for that opinion. In the old workings of this claim, tributers are still at work, and taking out good pay rock.

CENTENNIAL MINE.—Amount of ore raised and crushed at the Orleans mill, from this mine, has been 590 loads, the yield of which and sulphurets (and specimen sold for $20) amounted to $34,283.20, an average of $60.20 per load, which is considerably below the average of last year.

ITEMS.—*Transcript*: The June clean-up of the Excelsior mine at Smartsville was over $90,000. Ground is being broken at the Murchie mine to put in four more Frue concentrators. The four that have been in use there for several weeks past do their work so well that the company will discard the use of the Hendy machines altogether. Adolph Chaty, employed at the Derbec, came down the other day to secure 15 or 20 more miners to work in the mine. About 50 men are already working underground in the claim, and the new ones are wanted to increase the force. Additions will be made to the force as rapidly as room can be made for them. Drifts Nos. 7 and 8 have been connected. The gravel at this point is about 100 ft wide and is very rich. The monthly clean-ups are now being made at a number of mines in various parts of the county. During the past three days the Citizens bank has purchased over $10,000 worth of gold, one-third of which came from quartz claims and two-thirds from gravel claims. The banking house of Phil. Richards, at Ott's assay office, also gives evidence that the gold harvest is being reaped. A beautiful bar of gold, valued at $4,000 was displayed on his counter on day last week. The Idaho mining company has declared a dividend of $5 per share for the month of June. About 1,000 tons of good looking gravel is on the dump at the Derbec mine.

JOTTINGS.—*Herald*, July 3: Work in the El Capitan continues to develop good ore. The lead at the head of the 1st level is from two to three ft thick, and shows some free gold and much sulphurets. Indications are good for a first-class mine. The Deadwood company has lately struck a better class of ore than heretofore, and no fault could reasonably be found with that previously extracted. The prospects of the Deadwood making a first-class mine, grow brighter every day. Their shaft will reach the 3d level in 30 ft more. The Eureka Lake and Yuba Canal Co. cleaned up after a small run of two weeks in the Chimney Hill and Farrell claims, which resulted in over $17,000.

PLUMAS.

ITEMS.—*National*, July 5: At the Gold Stripe mine the 24 large stamps crush from 35 to 40 tons of rock every 24 hours. The rock averages $9 per ton. The ore in the mine and in the neighboring ones exists in very large quantities. The Monitor shows a fine vein of beautiful quartz, in many places filled with rich sulphurets and about 3½ to 4 ft in width. The tunnel is 900 ft, large and well timbered. In the Plumas National mine the ledge shows well in the shaft, five or six ft thick and the quartz bristling with sulphurets. The lower tunnel was driven 900 ft to the ledge.

TUOLUMNE.

A GOOD FIND.—Robert Sloan, an old American Camp miner has had the good fortune to strike a big lick in quartz. Last week, in prospecting half way up the ridge, near Five Mile creek, he discovered an exceedingly rich quartz lode. The vein is small as it crops out of ground, but the 40 or 50 pounds he broke off are nearly half gold in weight. The ore is so rich that it flattens out in the mortar, when pounded, like lead. Should the vein prove as rich below the surface, at any depth, he has all the wealth he can wish for.

YUBA.

ITEMS.—*Appeal*, July 2: From the recent rich washing of gravel in the Nevada and Golden Gate hydraulic mine, at Sucker flat, in this county, about $900,000 in the aggregate have been taken out from a comparative small amount of ground as yet wasned over. Pat Campbell, the superintendent of the mine, conceived the idea to sink bedrock cuts, with lateral branch tunnels opening into the main channel, with the result above stated. It is said by old miners and those who have seen it, that the gravel is literally bespangled with gold.

NEVADA.

WASHOE DISTRICT.

OPHIR.—Gold Hill *News*, July 10: On the 2000 level the upraise from the south drift has been connected with the sixth floor of the stopes and materially aids ventilation. The drain-pipe to the Sutro tunnel is laid, but all the connections are not yet made.

OVERMAN.—At the Forman shaft bob stations are being cut at the 300 and 600 levels. The timbers of the shaft are being eased in places. The shaft has attained a depth of 755 ft. A hoisting engine is being put in at the head of the winze from the 1600 to the 1900 level, which will cause a suspension of the work of sinking for two or three days. The pipes in the mine have all been connected with the Caledonia tanks, and yesterday morning the pumping engine was stopped, preparatory to removing it to the Forman shaft.

NORTH BONANZA AND FLOWERY.—The station on the 400 level has been completed and the chute is being timbered. When this is completed, sinking will be resumed and the lateral drifts above started up again. The north lateral drift on the 300 level is making rapid progress along inside the vein, and is cutting quartz which continues to improve as the drift progresses.

ALTA.—On the 1350 level the ore body has been opened by crosscut to the east wall and found to contain 12 ft wide of good ore, most of which is very rich, and two ft more of low-grade ore lying next to the clay.

CON. VIRGINIA.—The joint west drift, 850 level, is cutting a vein formation showing some quartz, its face 426 ft in.

JUSTICE.—The stopes on the 950 level are yielding a small amount of good ore. Crosscut west, on the 1550 level, has just cut the clay wall of the ledge, showing some very nice looking quartz to the west, but has not yet penetrated the ore body far enough to prospect it. The crosscut east on the same level is in very favorable formation, with seams of ore assaying very well. The main lateral drift south on this level is in favorable vein matter.

CHOLLAR-NORCROSS-SAVAGE SHAFT.—The work of pumping into the Sutro tunnel goes on favorably. As the water is lowered it is found that in places the heated flood has swelled the timbers somewhat, so as to render it necessary to ease them. By the first of the week the pumps will be ready to take water from the flooded mines through the "lightning drift" and raise it also to the tunnel level.

BULLION.—The bulkheads put in at the time of the fire in the Imperial have been all removed, and the mine found to be uninjured with the exception of the destruction of four sets of timbers on the 2000 level. The workings are now being cleaned up, preparatory to the resumption of operations. This will be done the last of the week.

SAVAGE.—The work of pumping into the Sutro tunnel is going on vigorously. The 2000 has been cleared, and found to be uninjured. It is expected that the Chollar-Norcross-Savage shaft will be ready soon to take water from the mine, when donkey pumps will be set at work, and about as much water will be sent over there to be raised to the tunnel level as is now being sent directly to the tunnel. This will greatly aid in clearing the lower levels.

ECHEQUER.—The bulkhead placed in the north drift, 2400 level, at the time of the fire in the Imperial, has been removed. The mine has sustained no damage, and as soon as an engine and blower can be placed to furnish air to the drift, work will be resumed. The winze through which the air pipes ran to this level has been destroyed by fire, and hence the necessity of providing other ventilation and means of getting air into the drift.

SIERRA NEVADA.—Work in the mine has been interrupted of late by water from the west end of the old south crosscut, 2200 level. The flow is, however, decreasing and is readily handled, so that work can go on again as usual, and stoping will soon be resumed, although there is an abundance of ore at the Mariposa mill for a month's steady run. The sump below the 2400 level is completed, as is also the 2300 station.

CALIFORNIA.—The joint west drift is averaging five ft per day through vein matter carrying some quartz; total length, 426 ft. The tank at the 1650 level of the C. & C. shaft is in place, and the pipes connected with it preparatory to taking water to the Sutro tunnel, but all connections beyond have not been completed.

LEVIATHAN.—Some improvement has been noticeable during the week, in the face of the north lateral drift on the 750 level, more quartz coming in with better assays.

JULIA CON.—Fair progress has been made in sinking the winze below the 1800 level, and a fine body of quartz of low grade is being developed.

LADY BRYAN.—On the 600 level the north drift is cutting a formation of broken quartz and porphyry, the former giving low assays. The south drift, same level, is also in low-grade quartz. The east drift, 750 level, is in birdseye porphyry and the west drift the same. Work at all points is making good progress.

BEST & BELCHER.—The east drift, 1700 level, is advancing through moist ground composed of clay and porphyry, and is making good progress. The Osbiston shaft is down 655 ft. Preparations for machinery on the surface are going on rapidly.

ANDES.—The crosscut east from the top of the raise and 60 ft above the 300 level is in fine looking vein material. Crosscut west, 300 level, is developing some fine looking quartz, but of low grade.

BELMONT DISTRICT.

BELMONT.—*Courier*, July 5: Crosscut west from winz has been advanced 22 ft; will have about 10 ft further to run before cutting the ledge. The raise from 300 level was advanced 27 ft in a three-foot vein of quartz and slate mixed. The quartz is carrying a little nice ore all the way up, and when the vein becomes solid will find ore in paying quantities. Also crosscutting west from 400 level drift 100 ft north of shaft in which continuation of the ore body below 200 level, is expected to be struck.

WILLOW CREEK DISTRICT.

ITEMS.—Paradise *Reporter*, July 5: The Ethan Allen ledge is widening but improving in richness as work progresses. The Ohio is also improving. The shaft is down 25 ft, and very rich ore being taken out; 10 tons of rock now on the dump ready for shipment to Salt Lake for reduction. The ore vein on the Caledonia is three ft wide and very rich. A tunnel on the claim is in 25 ft.

JEFFERSON DISTRICT.

GOOD LOCALITY.—*Courier*, July 5: Some miners working in Jefferson canyon have struck rich ore, and the indications are favorable for finding it in large quantities. Jefferson district is one of the finest mining districts in Nye county, but for some reason or other the mines are allowed to remain idle. Enough good ore (with proper management and a judicious outlay of capital) could be extracted from some of the mines to keep both quartz mills in the canyon pounding constantly.

COLORADO.

LEADVILLE.—Denver *Tribune*, July 2: The recent strike in the Highland Chief is believed to be equal to the richest discoveries yet made. This property lies about three miles east of the Pittsburg, on what is known as Breece hill, and but a short distance from the celebrated Breece mines. In the immediate vicinity are the Highland Chief, Black Prince and Miner Boy, all of which have mineral in greater or less quantities. The Highland Chief shaft is 110 ft deep, and the body of mineral thus far developed is about 10 ft in thickness, and very rich. The Black Prince, situated a few hundred ft to the north of the Chief, and nearly 100 ft in a vertical line further down the side of the hill, came upon a body of mineral several weeks since, but of low grade. This mine was bonded for $75,000, but before the bond had expired, the entire shaft caved in, leaving nothing behind but a small crater-like hole, about 12 ft deep and 15 ft in diameter. The Miner Boy, immediately adjoining the Black Prince, has recently come upon a body of low-grade mineral, probably the same that the latter struck several weeks since, and is now reported sold for the enormous sum of $75,000.

CENTRAL DISTRICT.—Only one well-defined vein has been discovered as yet at Lump gulch, in Central district, the majority of the locations not yet having passed through the float to bedrock. One of the most promising, shows fine globules of silver when roasted in a blacksmith's forge. A large dyke of porphyry, east and west in its course, passes through this vein. Northeast of Ellsworth, Peterson & Co. have a well-defined vein of silver-bearing ore, which they have named the Bluebird, the ore carrying quite an amount of carbonates of copper. Owing to the heavy seepage of water, no work is being done on the lode at present. On the divide between Lump gulch and the old Froggett ranch, J. W. Brown & Co. have a shaft down to a depth of 18 ft. The ore assays from 40 to 186 ounces a ton, selected samples going much higher.

IDAHO.

IDAHO CITY.—*World*, July 1: Mr. R. A. Goodliffe discovered a free gold-bearing mine seven or eight miles east of town two or three days ago. He considers it a good ledge. He returned yesterday, accompanied by Mr. Ralph Calderwood. Mr. Goodliffe also discovered a base metal ledge, but he has not had any assays made of the rock. Mr. Dave Bunch has located a large mine near the head of Alder creek, between Placerville and Garden valley. It is 11 ft wide and a four-inch streak in it is very rich. Mr. Louis Limbeck has a location on the same ledge.

YANKEE FORK.—*Personal*: The excitement has entirely subided. But little work is being done on any of the mines, save the Norton, which has a tunnel 450 ft deep, in good ore, and a shaft 65 ft deep. Not over 40 men are employed in all the mines.

MONTANA.

BUTTE COUNTY ITEMS.—*Miner*, July 1: The Leggat Bros.' mill is finished and ready to make its first run as soon as the river recedes from the great rise of the past two weeks. The low ground bordering the river being overflowed, the roads are at present impassable, and will remain so while the freshet lasts. A spur starting from

Continued on page 28.

Ornamental Cottage.

We give on this page a design by J. H. Hobbs & Sons, of Philadelphia, which may please some of our readers, who enjoy the ornamental in house building. Although this design inclines toward the elaborate and the ornate in the style of its finish, there is nothing excessive or not in keeping with the general plan. It is well adapted for a suburban or village cottage, rather than for a more strictly rural situation. Its form gives the exterior a variety of outlines which would distinguish it from most village houses as they are commonly designed.

By reference to the ground plan it will be seen that it is arranged for comfort and convenience. There is no waste room. The three principal rooms open directly into the front hall, which being room-like and large in its dimensions gives the impression of spaciousness to one entering the house. There is also a fine stairway upon one side of the hall. Attached to the kitchen, there is a large store-room, also a pantry. There can be a back stairway arranged between the dining-room and kitchen, if desired.

The second story, not shown in the engravings, is intended to be divided into four large chambers, each having a fireplace and clothes press. All the rooms are free and have separate entrances to the upper hallway.

Concerning painting a house with such a varied outline and uneven surface, the architects write as follows: "The paint should be only of one color, and trust to nature by the force of shade, sunshine and reflection to gild, darken and playfully light up and tint the various parts, which she does with far more delicacy than the patchy red blues and other striped colors, we so often see disfiguring otherwise good and beautiful designs."

It should be remembered when the mind is occupied with ornament in architecture that good architecture consists in so arranging the parts, their projections, hights and quantities to produce the effect of fitness, propriety and elegance, not in having a handsome cornice, an exquisite bracket or any delicate carvings, but a certain modesty should pervade the whole and nothing should stand forth so ostentatiously as to rob the rest of their just powers of attraction.

It will be noticed that this plan has the square bay window. We cannot refrain from speaking a good word for this form wherever it is in harmony with the general design. We have found it much more satisfactory than the octagon shape, both from the greater interior space enclosed, the greater facility for viewing, and the harmony of the shape with a rectangular room within.

In the plat of the first floor given in the engraving, the following are the rooms and measurements: *A*, front porch; *B*, hall, 11 feet 11 inches by 17 feet 11 inches; *C*, parlor, 16 feet by 20 feet 7 inches; *D*, sitting-room, 13 feet 10 inches by 19 feet; *E*, dining-room, 17 feet 11 inches by 18 feet; *F*, kitchen, 16 feet by 17 feet 11 inches; *G*, store-room, 9 feet 1 inch by 9 feet 1 inch; *H*, side porch.

Mining Decision.

The Supreme Court of the United States has, as a court of last resort, decided the case of the Flagstaff silver mining company, of Utah, vs. Helen Tarbet, affirming the judgment of the Supreme Court of the Territory of Utah. The following is the syllabus:

A location of a mining claim upon a lode or vein of ore, should be laid along the same lengthwise of the course of its apex at or near the surface, as well under the Mining act of 1866, as under that of 1872. If located otherwise, the location will only secure so much of the lode or vein as it actually covers.

Each locator is entitled to follow the dip of the lode or vein to an indefinite depth, though it carries him outside of the side lines of the location; but this right is based on the hypothesis that the side lines substantially correspond with the course of the lode or vein at the surface, and it is bounded at each end by the end lines of the location, crossing the lode or vein, and extended perpendicularly downwards, and indefinitely in their own direction.

If a location be laid crosswise of a lode or vein, so that its greatest length crosses the same instead of following the course thereof, it will secure only so much of the vein as it actually crosses at the surface, and the side lines of the location will become the end lines thereof, for the purpose of defining the rights of the owners.

A locator working subterraneously into the dip of the vein belonging to another locator, who is in possession of his location, is a trespasser, and liable to an action for taking ore therefrom.

The case was referred to before in these columns, when the Territorial Court rendered its decision, and attention is now called to it because the question is settled forever beyond all controversy.

Concentrated sulphuric acid attracts water with such avidity that in a damp atmosphere it will double its volume in a few days. Chemists use it to dry air and other gases, and to keep instruments, such as balances, dry.

Coal Mining at Mt. Diablo.

[Extracts from Graduating Thesis of J. O'Callaghan, University of California.]

The coal measures of Mt. Diablo are situated in a range of hills half way between the summit of the mountain and the San Joaquin river. This range is parallel to the San Joaquin, which is about five miles distant, and it is separated from Mt. Diablo by a deep valley. The altitude diminishes gradually from 1,700 feet in the western to 200 feet in the eastern part. The strata are tertiary, and are all elevated at an angle, probably by the mountain breaking through them. The general dip is to the north, being 32° in the western and 15° in the eastern part of the measures, which are about 12 miles long, as shown by the outcrop of the strike which runs in a general east and west direction. These strata are composed chiefly of heavy bedded sandstones, carbonaceous shales, clays and coal seams.

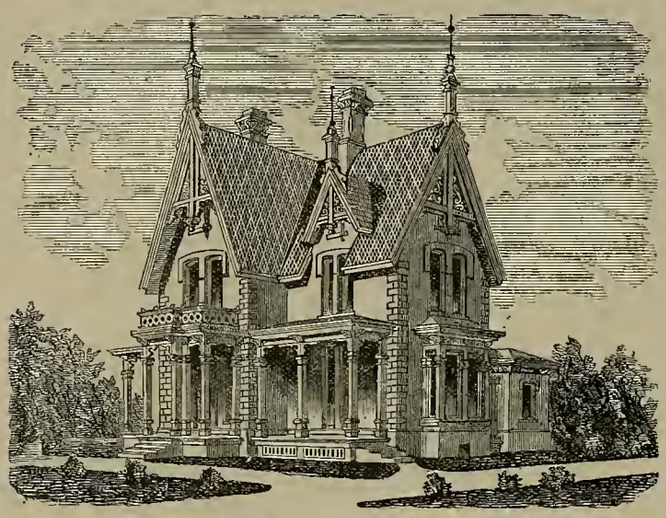
The mine of the Black Diamond Co. is situated in the most westerly portion, where the dip is greatest. This region is deeply dissected by narrow parallel canyons, which run from the San Joaquin plains to the summit of this range of hills. The canyon in which this company's mine is situated opens into a sort of striking the Clark vein at a distance of 293 feet. At this level a gangway runs east and west on the seam, and on this, at a point 85 feet east of the foot of the Mt. Hope slope, is a counter-slope sunk on the seam, and at present worked to a depth of over 700 feet.

The slope and counter-slope are both double-tracked, and strongly timbered every three or four feet.

The cars are hoisted by a round three-quarter-inch rope. This passes over a pulley three feet in diameter and is then wound on a cylindrical drum six feet in diameter, the motion of which is regulated by a 12-foot fly wheel. The engine has a 14x30-inch cylinder, and hoists a car in about 30 seconds.

The counter-slope is fitted with a similar plan for hoisting. Though the slope was much better than a tunnel and had a greater production, still it is much inferior to a vertical shaft for many reasons. The incline necessitates a greater handling of cars and causes a greater loss of power. Two separate hoisting engines are needed, and one of these is underground, while only one engine is necessary for a shaft, and that one is on the surface near the boilers. The only objection to a shaft is the great outlay necessary for machinery, etc., before any coal is produced. But by using double cages and increasing the speed the production can be enormously increased.

The Black Diamond shaft is situated about 620 feet northwest of the Mt. Hope slope, being



DESIGN FOR AN ORNAMENTAL COTTAGE.

amphitheater, caused by the main canyon branching into three or four smaller ravines. Here are the hoisting works, coal bunkers dumps, etc., while a few hundred yards down the creek is the town of Nortonville, in which most of the miners live.

Although there are four seams of coal in the Black Diamond Co.'e property, only two of these are workable. These are about 1,000 feet apart, horizontally. The upper or Clark vein is of an average thickness of 28 to 38 inches, not being interstratified by slate or clay, but is all good workable coal, except where crushed by the bending of the strata. The lower or Black Diamond vein has an average thickness of from four to six feet, but it is not such good coal as the Clark vein, and it is more expensive

First Floor.

to work, the roof and the floor being composed of shale and clay.

Opening Up.

Formerly these mines were worked by running in horizontal tunnels to the seams, but this was not profitable only to a limited depth, and this means of opening up is now entirely abandoned. In the case of a tunnel there is no outlay necessary for hoisting or pumping, as the mine drains naturally.

The next method of reaching the seam was by an inclined shaft or slope run in at right angles to the seam, and after striking it, a counter slope was sunk on the seam.

The incline now in use, and through which most of the coal has been hoisted, is called the Mt. Hope slope. It is situated at the head of the principal ravine, 797 feet above low water, and is sunk at an angle of 37° 15′ to the south, 839 feet above water level. It has a rectangular shape, the dimensions being 22 feet 4 inches by 11 feet 10 inches from out to out. This is the most convenient form, there being no pressure sufficient to necessitate a round or square shaft. It is divided into three compartments. Two are for hoisting, and are six by nine feet inside. The third was designed for pumping, but is now used for ventilation, and contains a ladder which runs the whole depth. This shaft is very heavily timbered all the way down by one and a half foot Oregon pine, the sections being placed about two feet apart, and is a fine piece of work, requiring very little repairing.

At regular distances down the shaft levels are run out to strike the seams. The distance between two levels measured on the seam is called a "lift." The lift is made as high as possible, because every level entails an additional expense; still the hight is limited by the difficulty of transportation and ventilation. The average hight of the lifts in this mine is from 300 to 350 feet, this variation being caused by the change of dip in the seams. At each station there is a difference of level of six feet between the levels running to the two seams, so that by one stoppage, a car from each seam could be run on the double cage.

Machinery and Hoisting Plant.

In the case of the tunnel, a horse could be used to draw out the cars, and horse power could even be used as a motor to draw the cars up the slope; but steam now entirely replaces these more primitive means. There is a great saving by using steam, as the surplus power can be utilized in pumping and carrying on many of the minor operations, such as surface transportation, running the screens, etc.

When the Black Diamond tunnel was sunk, a very extensive system of hoisting machinery was adopted. At the mouth of the shaft is a well-braced and substantial hoisting frame constructed of heavy pine timbers two feet square. This frame is about 30 feet high, thus affording ample room for the cages to come above the surface without hitting the top. This frame consists of six principal uprights all slightly inclined and bound together by a firm rectangular frame or top in which the pulley wheels work. Two of these uprights, in the line of greatest pulling force, are much more inclined than the others so as to act as braces.

The pulley wheels, two in number, are the large wheels over which the cable passes. The diameter of these is five or six feet, and they are provided with guides to prevent the cable slipping off.

In the drums it is very important that the diameter be large, as a short bend is very destructive to iron rope. In Europe the average drum is 20 to 25 feet, while here it is no more than five or six feet in diameter.

There are two kinds of drums in use at these mines; the ordinary wooden cylindrical drum for round cables, and the spool or bobbin drum for flat cables. The latter is used at the Black Diamond shaft.

There seem to be many advantages of the flat cable and bobbin over the round cable and cylindrical drum.

The flat cable winds upon itself and thus by increasing the diameter at each winding prevents the acceleration of a descending cage, which if the shaft were deep would necessitate a conical drum in case of a round rope.

The flat rope seems better than the round rope, as its diameter is less than that of round cable of equal strength. The flat rope can be mended easily and last for two or three years.

Two bobbins are fixed on the same shaft, and thus the engine has to hoist the weight of the coal, as the cage and empty car balance an equal weight of the other cage. By this means the motion is always uniform.

The engine used at the Black Diamond shaft has two horizontal 24-inch cylinders with five-foot stroke, and the power is applied directly to the shaft, thus doing away with a fly-wheel.

The foundation of the drum and engines is of solid brick built from bedrock.

The steam is supplied to the various engines by 10 large Cornish boilers, so connected that any two may be repaired without causing the others to stop. This great number is necessary because the only water available for use is mine water, and as this is very sulphurous, incrustations form very rapidly.

The steam pipes are packed in asbestos, but there is necessarily a great loss by condensation in pipes many hundred feet long.

The fuel used is the slack coal from the screenings, and many tons of this almost unsalable fuel are burned each day.

Opening Out.

Whether the seam be reached by an incline or by a level the same system of opening out and working the coal is adopted. The system here in use differs from the ordinary one on account of the steep dip and the thinness of the seams. From the point where the level reaches the seam a gangway is drifted to the right and left on the seam; the dimensions of this gangway are determined by the thickness of the seam, the strength of the roof and the requirements of transportation and ventilation. The average dimensions in these mines are 8 feet wide at the floor, 5 feet wide at the roof, and 5 feet from floor to roof.

By adopting this trapezoid form, the requisite width is obtained and the least support is removed from the roof. These gangways are given a grade of a few inches in a hundred feet. The floor consists of rolley-way and a rude channel on either side for drainage.

Faulting is a chief feature of this mine, and it causes great difficulty in drifting. Almost every case is that of a simple slip, in which the strata on the hanging wall have sunk. The direction of the gangway must then be changed until it again cuts the seam, and it must cut it in such a way that the foot wall of the seam is about four feet from the floor of the gangway, so that care can be easily loaded from the shoots.

Working the Seam.

Every 20 feet along the gangways on the seam shoots four feet wide are run up the seam, only the thickness of the seam being worked out. Safety pillars of coal 20 feet square are left all along the upper part of the gangway. The face of the seam is thus worked by a system of irregular steps.

As the coal is detached from the mass, it is allowed to slide down the shoots on slides constructed of sections of old boiler iron, which are laid so as to overlap one another. Thus by the simple action of gravity the coal may be transported several hundred feet, and by opening the mouth of the shoot it may be loaded into cars in the gangway.

Timbering.

Pine and redwood are the only materials used for timbering. All timbers are cut outside and are numbered so that they can be sent in and fitted without further trouble. The stations and levels being the most permanent, are strongly timbered with the heaviest timbers. The method of timbering the gangways is very simple, consisting of two uprights surmounted by a cap piece or crown. The uprights are inclined, so as to shorten the crown piece without losing space. The size of the timbers is eight feet long by eight by ten inches in cross-section. These timbers need continual repairing, some being replaced every two or three weeks. On an average the timbering is replaced every three months. The stopes are timbered with redwood pieces four by six inches.

Underground Transportation.

The cars are of such a size that when loaded they can be easily handled by one man. The usual capacity is one ton of loose coal. They are made of heavy pine planks strongly banded with wrought-iron. The internal dimensions are: Length, six and one-half feet; width, two feet two inches; hight, in front, two feet five inches; in rear, two feet eleven inches. These cars run on ordinary strap rails, which are spiked on wooden stringers. The gauge is three feet. Trains of from five to six of these cars are drawn from the working parts of the mines to the shaft by single horses. The average distance is over one-third of a mile.

Hoisting.

The cage is made of iron and has two plat-

forme six feet apart. Each platform is provided with tracks for the cars. The time of hoisting is one minute for 400 feet. At the top of the shaft is a light wooden railing, which is carried up by the cage, leaving the way clear for the cars to be run off. As a security against accidents, the cage is fitted with a safety-fastening for the cable and a safety-catch to prevent the cage falling to the bottom. A good deal has been written about safety-catches and many kinds have been suggested. Generally after an accident some such device has been adopted. After awhile the men, relying on the security of the invention, become careless, and thus invite another casualty. Also from long disuse the apparatus may be out of working order, or, if constantly in use, it may become worn out when most needed. The safety-catch adopted at this mine consists of two eccentric cog-wheels, so arranged that if the cable is loosened a powerful spring forces these eccentrics to grip the sides of the guides. This seems to be very effective, and does not disturb the timbering or destroy the guides. The safety-fastening of the cable is a device to prevent overwinding by unloosening the cable if the cage goes above a certain hight.

Surface Transportation.

When a loaded car arrives at the surface, it is rolled off, an impetus being given it by rolling an empty car against it. The car is switched onto its appropriate track according as it goes to the dumps or to the bunkers. The bunkers are situated about 500 feet from the mouth of the shaft. Between these places there is a double track, built on a trestle, having a slight grade toward the bunkers. Over this track runs a slack endless wire cable one inch in diameter and jointed at intervals of eight or ten feet, by swivel joints. On the back of each car is an iron plate with notches in it. As the car is pushed under this cable the joints catch in the notches and the car is drawn to the bunkers. This cable is kept in motion by a small, one-foot stroke engine, which turns a patent grip pulley about four feet in diameter. The average time of a car, from arriving at the surface to dumping, is about three minutes. Thus, in the entire operation, the coal is brought from the face of the seam to the bunkers without being transferred from one car to another.

The dumping is performed by an ingenious automatic-dumping platform. The forward end of the car is a door, which is suspended from the top by a rod acting as a hinge. This door is secured by a latch. The car runs on a small platform about four feet long, on which a track is laid, the ends of which are curved up to fit the wheel of the car. This platform is hung on side trunnions two feet above the rails, and by the impetus of the loaded car and the shifting of the center of gravity, the whole platform tips forward. There is a piece of curved iron so arranged that it will strike under the latch, and thus throw open the door, allowing the coal to dump on the screens below.

There are two of these dumping platforms, supplying two sets of screens, which are given a "jigging" motion by the small engine that runs the surface cable. The coal is picked and sorted by men and boys, who break the larger lumps by small picks and sledges, and cast the "bone" aside. The screens are at an angle of about 33°, and separate the coal into two grades. The marketable coal passes into bunkers, which hold about 1,600 tons. The coal is carried to the river by trains of coal cars made of sheet iron, and carrying about four and a half tons each. They are dumped at the wharf by a dumping platform similar to the above but worked by machinery. The cars descend by the action of gravity, and are drawn back by a small engine.

Ventilation.

Good ventilation is of more importance in coal mines than in any others on account of the danger, not only of impure air, but also of highly explosive gases. There are many causes of impure air, such as high temperature, breathing of men, burning of lamps and slow combustion of coal and sulphur, decomposition of wood and accumulation of gases from the coal. Blasting is now done away with, except in safe places. The Davy lamp is used to test all places in which the gas may have formed. Sulphurous acid and sulphydric gas are very abundant in some parts of this mine.

The mines are admirably located for good ventilation. Several different devices have been used to cause artificial ventilation, but the one which seems most successful is the one now in use. There is a large fan-wheel at the mouth of the shaft. This wheel is 24 feet in diameter, the fans being 5 feet wide. It is run at a moderate speed by a 3-foot stroke engine. This fan-wheel draws the air out of the mine by a separate compartment. About two-thirds of the air goes down the hoisting compartments, and the remainder through an old ventilating shaft. By means of a system of canvass and wooden doors in the main gangways the air is made to traverse the smaller workings where it is most needed. There seems to be ample ventilation even in the remote portions.

Drainage.

These mines are also well situated for drainage, as the water naturally accumulates in the lower levels. The water is forced from each level to the level above by a double system of force pumps. The volume pumped out daily is immense, and does not vary much with the seasons.

Lighting.

The miners use small portable oil lamps which can be hooked on the cap. Each one supplies his own oil.

Losses of Coal.

The losses in this mine are very slight, and are more the result of mechanical crumbling of the coal which forms unsalable fuel; very little coal is left standing in the mine.

Production.

The Mt. Diablo mines have produced up to 1877, about 1,875,000 tons of coal.

The Black Diamond mine is under the management of Mr. M. Morgans, and it is due to his kindness that I have been able to obtain the above facts.

Useful Information.

Geographical Problems Solved.—Within the present generation, and mainly during the present decade, nearly all the great geographical problems left us by our adventurous ancestors have been solved; all the great lines of exploration have been taken up and worked out with a success that leaves to the future only the details to fill in. The northwest passage was completed more than a quarter of a century ago; the Australian interior has been crossed and recrossed within the past few years; several bright lines now break up the once mysterious darkness of the "Dark Continent;" the sources of the Nile have been traced, and the course of the Congo all but laid down; the Russians have filled up many important blanks in Central Asia; there is now no mystery to speak of for geographers on the North American Continent, and none of any magnitude on the South; even the great outlines of the ocean-bed have been chartered, and now at last, after a struggle begun more than 300 years since, the northeast passage has been made with an case that makes one wonder why it was not done long ago. A matter-of-fact Swedish professor has shown that with a suitable ship at the proper season this long-sought for passage to the "Far Cathay" is a question of only a few weeks. Of Arctic feats there now remains only the "dash at the Pole," and that the North Pole will be reached sooner or later there can be no doubt.

Fire-Proof Mining Timber.—A Glasgow engineer, D. R. Gardner, recommends the following as a remedy against accidental ignition of the timber in mines: When he desires to strengthen, harden, densify, season the timber and preserve it against decay and attacks of worms and insects, he merely dissolves and removes the sap, which he does by placing the timber in a tank and subjecting it to the action of neutral vapor, separately or combined, and in any order, and the process may be carried on continuously or intermittently from about 6 hours to 84 hours. He preferably begins with the neutral vapor, then alkaline vapor, the neutral vapor or fumes of mercury; the time may be 24 hours for each of the first three steps, and 12 hours for the last, which should be the fumes of mercury, if for preservation. The alkali and acid may be applied by being put into the boiler or otherwise, and the vapors can be tested by litmus paper, as to their neutral alkaline or acid state. The mercurial fumes are created by mixing equal quantities by weight of mercury and nitric acid, and allowing them to escape in the tank.

An Effective Gate-Fastening.—We recently saw a neat, cheap and effective method of fastening a gate. It was in use on a ranch in Sutter county, and is, we have understood, unpatented, so that, if we can make its method evident, our readers may use it everywhere. The gate is hinged, and swings in the usual manner, except that it is best to use hinges which will allow it to swing either way with equal ease. Plant the gate posts so that the gate will swing past. Then take a piece of inch iron, either square or round. Let it be three times as long as one side of the square scantling used at the end of the gate. Bend it, in a forge, to a shape similar to the upper part of a letter T, or like three sides of a square. Cut a notch in the post at any desired hight, and fasten this iron in by a staple, so that when lifted up the gate slips past either way, but when dropped it clasps the end of the gate. If properly cut, the notch will keep it from dropping past a horizontal point, and cattle will hardly find out how to open it.—*Exchange.*

Steam-Proof Cement.—*Dingler's Polytechnic Journal* gives a description of the manufacture of a new steam-proof cement, discovered by Mr. A. C. Fox, which, it is claimed, is not affected by hot or cold water, nor by acids or alkalis. First, a chromium preparation is made in the following manner: 2.5 parts, by weight, of chromic acid are dissolved in a mixture of 15 parts of water and 15 parts of ammonia. To this solution about 10 drops of sulphuric acid, and, finally, 30 parts of sulphate of ammonia and 4 parts of fine white paper, are added. When about to be used, gelatine dissolved in dilute acetic acid is added.

Protecting Lead Pipe.—The *Revue Industrielle* says that the interior of a lead pipe can be covered with an incrustation of sulphide of lead by making a warm concentrated solution of sulphide of potash flow through it for 10 or 15 minutes. Pipes thus treated seem to be covered with grayish varnish, which prevents the water flowing through them from acting upon the lead.

Explosive Force of Dynamite.—We learn from the *Scientific American* that there is a misconception about dynamite exciting a greater force downward and gunpowder upward when exploded. Nitro-glycerine (the explosive agent in dynamite) yields on exploding about 900 times its volume of gas; gunpowder but 300. This gas, suddenly liberated, must displace a portion of the atmosphere, which presses with a weight of about nine tons upon each square yard of surface. To lift such a weight in the exceedingly short space of time occupied in the explosion of a charge of nitro-glycerine (in the form of dynamite or otherwise) would require a force greater than to split a rock, and the rock yields. Gunpowder yields but one-third as much gas on exploding, and the complete combustion of its grains requires an appreciable amount of time. Nitro-glycerine explodes all but instantaneously.

Preserving Insects.—A. Labouliere recommends plunging the insects, in the fresh state, into alcohol which has been saturated by digestion with arsenious acid (1½ pint will take up about 14 Troy grains of arsenic). The living insect put into this preparation absorbs about 0.003 of its own weight. When soaked in this liquid and dried the specimens are safe from the ravages of moths, *anthrenus* or *dermestes*. This treatment does not affect the color of blue, green or red beetles, if dried after soaking for 12 to 24 hours. *Hemiptera* and *orthoptera* can be treated in the same way; also the nests, cocoons and chrysalides of insects.

Trichinosis.—In some of the Eastern States to find trichina in pork is no uncommon thing, but in Oregon such meat was unknown until a few days ago, as the following proves: Willie Palmer, living near Monmouth, died some time since, and Dr. Shipley has discovered that his death was caused by eating trichinous pork. A piece of muscle taken from the body of the dead boy was sent to this city, and under a microscope shows the parasites in great numbers. This is the first case of the disease on the Pacific coast, we believe.—*Portland Standard.*

To Cut a Hole in Glass.—To cut a round hole in a pane of glass of any required size so as to save the pane, use a copper tube of the size of the required hole; revolve it in contact with the glass, and supply it with emery and water.

Good Health.

On Diphtheria.

Dr. E. M. Snow says, in his last report as Register of the city of Providence:

In connection with this subject I think it my duty to ask the attention of the people of Providence, and especially of parents, to the following statements:

1. No case of diphtheria occurs without an adequate cause. This is self-evident.
2. The cause of nearly all cases of the disease exists in the houses or premises, or within a few feet of the houses where the cases occur.
3. The cause of nearly all cases that occur in the city is breathing impure air from privy vaults or sink drains, or cesspools; or drinking impure water.

Much observation and long-continued and careful investigation have perfectly satisfied me of the truth of these propositions, and they are applicable to all cases, whether in the tenements of the poor or in the mansions of the rich.—*Med. and Surg. Reporter.*

Origin of Diphtheria.

Diphtheria is believed to have originated in Egypt more than 2,000 years ago. It prevailed in Egypt and Asia Minor, to which it extended, during the first 500 years, and hence was early called an Egyptian or Syriac disease. Having invaded Europe, the disease appeared in Rome, A. D. 330, and being highly contagious, in its 1,500 years transit on the continent of Europe, it affected mainly rural districts and garrisoned towns. It extended to Holland, in which it was epidemic in 1337; to Paris in 1576, and again appeared there in 1771. It prevailed more extensively in France in 1818 and 1835, and in England, the United States and Canada from 1856 to 1860, and more or less since.—*Hospital Gazette.*

Is Glucose Candy Wholesome?

If a manufacturer is really conscientious, he must give up the use of glucose in candies, or at least use it very sparingly. We know it will be a sacrifice, as glucose can now be had for from three to four cents a pound, while cane sugar costs about four times as much; but we are of the opinion that it is decidedly injurious, especially for those who have a tendency to dyspeptic sourness of the stomach, and this for the following reason: When cane sugar ferments, it changes first into grape sugar; it is the same with the starch in corn, wheat, barley, potatoes, etc., which, with the help of plenty of water and some heat, break up into dextrine and glucose—we say break up, as the fermentation is a destructive process, which in its gradual career of disorganization changes elaborate organic compounds into more simple ones. If the fermentation is stopped by drying the grape sugar it is the end of it for the time being, but if the grape sugar is again dissolved in water and properly diluted, fermentation will go on to a further stage, and the result will be alcohol or vinegar, according to the temperature; if this is kept down to about 50° Fah. alcoholic fermentation will take place, and every molecule of grape sugar will be broken up into two molecules of alcohol and two molecules of carbonic acid; if the temperature is above 70° Fah., acetic fermentation will take place, and the grape sugar will be broken up into acetic acid, hence two kinds of fermentation are acknowledged by chemists—the alcoholic and the acetic. Brewers always want the first kind, as otherwise they would brew sour beer. This is why they use so much ice in summer; in olden times, before the use of ice was so common, they had to close their breweries during the summer, as they could not work—at least could not brew good beer. Now, in the human stomach the temperature is always above 70° Fah., and the conditions for acetic fermentation are favorable. If the digestion is vigorous the sugar is absorbed before fermentation takes place, and persons with strong digestive powers can often absorb grape sugar before it has time to ferment and become acid; but when the stomach is in the least weak or slow in its action, it has time for this, and sourness or dyspepsia is the result; such persons may be able to digest cane sugar, as this takes much longer to enter into acetic fermentation, as it must first turn into grape sugar or glucose. For these reasons it is not advisable to use grape sugar, and therefore we earnestly warn all persons troubled with weak digestion or sourness of the stomach to avoid the new fashioned candies, even if they are called "old-fashioned molasses candies." They are most all made of glucose, and nothing else. If you want sweets, take a lump of good white or crystallized cane sugar, then you know what you are eating; but when you eat candies you do not.—*Manufacturer and Builder.*

Drug Taking Mania.

Women are rather more given to drug taking than men, though both are bad enough in this respect. Here is what one of our most eminent physicians has to say on this subject:

"Dr. Holmes has said that it would be well for the world if most medicines were thrown into the sea; that it might be bad for the fishes, but it would be better for mankind. For this unasked and impertinent suggestion he has received a good deal of orthodox censure, which I am here now to share with him, for I am of the same opinion as Dr. Holmes, and this opinion has long been a part of my Christian faith. That the major part of the world does not agree with us is plain. Indeed most people seem to think that the chief end of man is to take medicine. Babies take it in their mother's milk; children cry for it; men and women unceasingly ask for it. Shrewd men have taken advantage of this instinct, and in most civilized nations it is to-day one of the chief articles of manufacture and commerce. It is one of those things which is never permitted to be out of sight; but is thrust upon you in the nursery, in the streets, upon the lamp posts and upon the curbstones, along the highways, from the rocks which border the rivers; the medicine chest follows you at sea, as if the sea itself, a vast gallipot of nauseants, were not enough. One might naturally suppose that the supply would at length exceed the demand! but it does not. Everywhere the people are stretching out their arms and begging for medicine, blessing him who gives and cursing him who withholds. They believe, in their simplicity, that if medicines do no good, they can at least do no harm. They imagine, also, that there is a medicine which may be regarded as a specific for every human malady, and that these are known to science, and that therefore we have the means of curing all diseases; but the people imagine a vain thing. Whatever medicine is capable when properly administered, of doing good, the same medicine is equally capable, when improperly administered, of doing harm; and drugs often substitute a malady more serious than that which they were intended to cure. The Irishman said his physician stuffed him so with medicine that he was sick a long time after he got well.—*Dr. Frank Hamilton.*

Brain Work and Skull Growth.—The London *Medical Record* sums up as follows the results of some very interesting measurements of heads by two French physicians, Messrs. Lacassagne and Cliquet: Having the patients, doctors, attendants, and officers of the Val de Grace at their disposal, they measured the heads of 190 doctors of medicine, 133 soldiers who had received an elementary instruction, 90 soldiers who could neither read nor write, and 91 soldiers who were prisoners. The instrument used was the same which hatters employ in measuring the heads of their customers; it is called the conformator, and gives a very correct idea of the proportions and dimensions of the heads in question. The results were in favor of the doctors; the frontal diameter was also much more considerable than that of the soldiers, etc. Nor are both halves of the head symmetrically developed; in students, the left frontal region is more developed than the right; in illiterate individuals, the right occipital region is larger than the left. The authors have derived the following conclusions from their experiments: 1. The heads of students who have worked much with their brains are much more developed than those of illiterate individuals, or such as have allowed their brains to remain inactive. 2. In students the frontal region is more developed than the occipital region, or, if there should be any difference in favor of the latter, it is very small; while in illiterate people the latter region is the largest.

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The Week.

Among the more notable events of the week in connection with mining matters, we have the non-payment of June dividends by the Con. Virginia and the California companies, the only Comstock mines that have of late been making any net earnings, and we might also say any earnings at all. To a pitiful sum indeed has the product of the great Washoe lode been reduced, and unless it shall undergo early enlargement we cannot see what is to keep up the prices of Comstock shares much longer. By some seeming fatuity the bullion output of these mines is in the inverse ratio of the facilities furnished for making it. With the multiplication of mills, the extension of exploration and provision for deep drainags, their gross earnings have undergone steady shrinkage, raising the question whether some of this expenditure may not have been premature—whether these costly works for drainage and reduction should not have followed instead of preceding ore developments. Let us, however, hope for the best.

From the Bodie mines cheering accounts continue to reach us, the late ore finds in the Standard and Bodie improving with both downward and lateral exploration. The news comes to hand this week of promising quartz mines being opened in Alaska, some account of which will be found in another column. The constant appreciation of silver gives encouragement to those engaged in mining for that metal, and will very likely lead to the re-opening of some mines now closed, and generally stimulate this branch of vein mining. Subsidiary silver coin is now worth in this city very nearly as much as gold; the discount on half dollars not exceeding one-half of one per cent., a good deal being taken by brokers at one-tenth of one per cent., and some at par. Water holds out well with the hydraulic miners, many of whom still continue washing operations and, with a diminished water supply, will be able to do so for several months to come. The water season has, in fact, been prolonged beyond expectation, and this class of miners will make a full average clean-up of gold this year.

They Inaugurate the Game in New York.

Through all channels of intelligence we are advised of a growing interest in mining affairs at the East. This information, announced first by telegraph, receives later confirmation through private letters and newspapers coming to hand from that quarter. The New York *Times*, of recent date, remarks that the evidences of a growing disposition to speculate in mining shares are too numerous and palpable to be mistaken. In anticipation of increased activity in this class of securities, the price of seats in the mining stock board of that city has recently advanced several hundred per cent. Brokers, who before carefully eschewed this class of paper, are now operating in it extensively. Numerous mining companies, with flaming circulars and officered by prominent politicians, are being formed there, who, immediately they are organized, proceed to widely advertise their properties, purposes and prospects. Every little exchange shop down town has its freshly written placard announcing all kinds of mining stocks bought and sold within. Claim owners, agents, experts, middlemen and promoters of every description fill the hotels and swarm about the business centers, the inevitable "process man" being also present with his clever methods for extracting the precious metals, from the most obdurate ores, closely, quickly and cheaply. Many of the knowing ones, men early to perceive the tendencies of the times and accustomed to forestall the coming market, have gone, or are about to go, West for the purpose of buying, bonding or otherwise securing control of mining properties; being desirous of seeing for themselves and saving the commissions of go-betweens.

Observing these things, the *Times* justly concludes that they indicate a growing excitement about mining matters, which, if suffered to go on unchecked, will be very likely to lead to widespread and ruinous speculation. We think there is a danger of this. Even at this distance it looks to us that way. These are the symptoms that usually precede an unhealthy activity in the mining share market. This gathering of mining sharps and adventurers in Eastern cities; this multiplication of "bucket shops" there; these numerous, respectably headed and well advertised mining companies, with such great appreciation in the price of seats in the stock board, are the sure forerunners of a big gamble in this class of securities. This is the sort of machinery manipulators employ for enthusing the masses and popularizing the shares of these mining companies. When we see recourse had to these methods of procedure, with their exhibition and blare, we know what it means: It means gain to the few and loss to the many. It means seeming and short-lived prosperity to be followed by general distress and injury to every branch of legitimate business, including mining itself, which latter is harmed more perhaps than any other industry by these seasons of undue inflation and reckless investment.

To those who have fully made up their minds to engage in this species of gambling, we have no advice to give, for the reason that they are apt to be either too well informed to require or too illy informed to feel the need of any kind of advice. Nevertheless, there may be those prepared to profit by the experience which we on this coast have had in this and other speculative branches of mining. With us the errors and abuses attendant on gold and silver mining have, in the several epochs of this business, taken on various forms and phases. Overlooking the mistakes of the pioneer miners, which were mostly of a practical kind and confined in their effects to those who committed them, we will here briefly advert to some of the evils that subsequently came to be engrafted upon this industry and the mischievous ends it has been made to subserve.

Under the stimulus imparted to vein mining, through the discovery of the Comstock lode, thousands of prospectors turned out to search for this class of mineral deposits, the most of whom, making their way over the Sierra Nevada, proceeded to explore the regions beyond, where they lost no time in locating innumerable claims, the most of which were, of course, wholly worthless. These claims were made the basis for the organization of a great many companies, incorporated with a large number of shares and an immensity of nominal capital. Then followed a season of general excitement and speculation. Everybody was loaded up with these mining shares, the rich and the poor alike engaging in the traffic. By-and-by it turned out, as should have been foreseen from the first, that these mining claims possessed little or no merit, and the whole community became loosers. And so the people on this side received their first lesson in speculative mining.

Meantime a mining stock exchange had been started in San Francisco and got down to business. Having prospered, this institution was followed by three others here and a fourth planted in Virginia City. Through a long series of years the most of these establishments were well sustained, some of them having flourished exceedingly. Of late, however, their patronage has begun to fall off. Sales have diminished and business languishes to an extent that threatens its early extinction. It is impossible longer to enthuse the masses. To get up an old-fashioned sweeping deal seems out of the question. Manipulators find it necessary to use fresh bait or angle in other waters. In this extremity those in interest are seeking to transfer the business to a more appreciative constituency and a more genial soil. Californians having been milked to the strippings, it is meet that the milking machine be taken hence to perform a like service where the lacteous fluid remains still abundant. As it may suit these Orientals to stake their money on this sort of a layout, we shall not object to the removal. They are welcome to the gambling arm of the business so long as the mines and their legitimate proceeds are left to us. The game, though not wholly new, may serve to slightly diversify their old methods and make them more attractive. We wish them a happy experience with their new acquisition, hoping they will find delectation in it while it lasts, and have happy riddance of the institution when they have had enough of it. They have already establishments in the great Eastern metropolis akin to these stock exchanges. To discriminate widely between the operating methods employed in the mining bourse and those in use at the place of the man Morrissey involves distinctions too nice for our unschooled casuistry.

On the character of the men who are seeking the advancement of mining schemes in the East we forbear to comment. If the people there fail to make early discovery of their true worth, they possess less discernment than we give them credit for. But this we will say, some of these are men to be trusted and some are not; wherefore those who deal with them will be liable to get good bargains and bad. To parties abroad who propose engaging in the business of mining on this coast in a practical, business-like way, we take it upon us to say there never was a better time for doing so than the present. With the experience now gained, mining for gold and silver here, offers better inducements for the investment of money than any other industry whatever. If those about to embark in it will only observe the same caution, economy and general good management, that is deemed essential in every other pursuit, they cannot fail of success in the end. Prosecuted under these conditions it is not only the safest but also the most profitable and every way satisfactory business that to-day invites capital and enterprise either here or elsewhere. The California gold mines are now yielding better profits on the money and labor expended upon them than ever before. Those working them, whether in a large or small way, are nearly all doing well. Scarcely anyone is loosing money at the business now. It has been advanced beyond that stage, and promises hereafter to do better and better with each succeeding year. Let those who purpose becoming interested in mining avoid stock gambling, and, embarking in the business in a prudent way, follow it up as the great body of miners in California have done, and, our word for it, they will have abundant reason to be content in the end.

Gold and Silver Production of the World.

At a time when silver is to become a powerful factor in influencing European trade, Dr. Soetbeer affords an opportunity to ascertain what the production of the precious metals has been during the last few centuries. Between the years 1493 and 1875, a perod of 383 years, the known production in weight of the precious metals was: Gold, 25,234,954½ pounds troy; silver, 483,770,779¾ pounds troy. Some uncertainty must always attend an estimate of this description, extending as it does over so great a space of time, yet in the main the above amount is substantially correct. During a century and a half the proportion of value between silver and gold dropped from about a ratio of 10.7% to about one of 15.5%, and remained at that point for about two centuries more. The proportion of gold produced, to silver, was far larger from 1851 to 1875, than during the earlier periods. From 1876 to 1878 there has been no important change in this ratio, and we may expect that the value of gold is naturally more likely to drop than that of silver. The sudden action of Germany in throwing an immense mass of silver on the market, derived from the surplus silver coin of that country, when a gold standard was adopted, and of France and the Latin Union in declining to receive it overbalanced the natural laws governing the question. But the effect was only temporary, as appears from the reaction already set in by Italy demanding a release from her obligations not to coin silver, and the equilibrium is nearly recovered already. The proportional relation of value between gold and silver is mainly independent of legislative action, and all that legislation has ever done or possibly can do, aside from exercising a depression, is to record the results developed by industrial activity. J. S. Mill says "money, like commodities in general, has a value dependent on, and proportioned to, its cost of production; the theory of money is, by the admission of this principle, stripped of a great part of the mystery which apparently surrounded it." The relations of value between gold and silver adopted by most modern nations are relations justified by the proportion of the supply of the precious metals. Variations in the proportional value will continue, but the solution of these points must be left to the gradual development of the natural course of events.

Mining as King.

The immense mining industry developed on this coast, instead of showing any signs of weakening, continues to acquire additional magnitude every year, month, nay, day, has turned a flow of Eastern capital in this direction such as was never known before. The East, disgusted with the ordinary stock investments and bottomless corporations, have been eagerly seeking a solid foundation upon which to build a capitalizing structure, and it has found it in our mines. The gold, the silver, the solid endurable basis of wealth, exists there, really; and, besides its reality of existence, the chimerical windbags of Eastern wildcat-swindling companies collapse. Solidity was sought in the exciting fluctuations of the gold board of New York, and the brilliant bubble, so beautiful and satisfying when distance lent enchantment to the view, faded away at a touch and the visions of wealth became swallowed up in the despair of lost fortunes. Again was solid wealth sought in the oleaginous schemes of Ohio and Pennsylvania, when to possess an oil well was the acme of human enjoyment and commercial importance. But oil flowed, burned, exploded and left not even a grease spot in the pockets stuffed with scrip and stocks into the millions.

Coal sought its devotees and the black shining requirements of household comforts and steam conveniencies winked its shining eye alluringly at the wavering capitalist seeking for an honest penny. But its allurements were likewise fatal. Although possessing solidity it could glut the market; the supply could exceed the demand and pockets became depleted by a tremendous drain to satisfy the insatiable maw of expense.

Real estate, that ownership of the earth which all men seek, if only to lay therein their weary bones after life's fitful fever is over, became overloaded, and in falling smashed many a paper balloon of hopes and mortgages, demonstrating that men were getting nearer the real satisfying want, but had not yet reached it. Nothing that had been tried filled the vacuum, because the *material* possessed no intrinsic value, and could be used only as the basis of a valueless paper fabric of promises to pay.

At last, the bonanza developments showed a circulating medium of yellow shining eagles, having not only a commercial value, but a real intrinsic value, something for the flinty hearts of capitalists to love for its own sake, and as naturally as a duck takes to water, or as a business man takes to the bank for supplies—so went capital to the source whence these shining eagles were obtained. And so capitalists have found the right foundation, a foundation not built in sand but upon rich ore, containing gold and silver, articles capable of being directly converted into money by the stroke of a steel die. Something to spend, to stow away—a solid, enduring material, the musical jingle of which charms the ear of all humanity, and unfortunately more attractive than the music of angel voices. Our mines are flourishing, our rich mineral deposits so far from decreasing are increasing, and while it is true that every million taken from the mines decreases the value of the same by that amount, yet we are adding to the world's requirements a material, a commercial medium, which instead of lying dormant deep in the bowels of the earth, will circulate as infallibly as the ocean currents and for as long a time. Truly mining is now king! Recognized as such by the dominant voice of capital, and the East will continue to come to us as it *must*, or remaining aloof, fall into desuetude through lack of a friend near the throne.

TO CORRESPONDENTS.—In the multitude of contrivances and processes now existing, it sometimes happens that an old invention will be described as new or attributed to some individual not entitled to it, and to this fact of multitude must be attributed mistakes. We desire nothing but new and useful facts without unnecessary individual laudation. The development of our mining and industrial conditions is always a matter of benefit. We hope our correspondents, captivated by local circumstances, will not *invent* what is old.

EXPLOSION AT BODIE.—As we go to press we receive news of the explosion of the Giant powder magazine near the Standard mine. Five tons of Giant powder exploded, completely destroying the works and the property in the vicinity. About 20 persons were killed and 50 wounded. The shock was felt 20 miles from the scene of the disaster.

IT is estimated by English journals that the loss in wages occasioned by the late strike of colliers at Durham amounts to $3,000,000, $1,000,000 of which was borne by the men. Each miner has, it is said, lost $25.60 in wages in a strike in gaining 1¼% better terms than the owners offered at first, 1¼% being 0.8 cent. in the dollar. The colliers will have to work 9¼ years to recover the $25.60 without reckoning interest.

A MINERS' Union has been started at Nevada City, under favorable auspices. It will have a membership of 200 in a short time.

The Bennett Polar Expedition.

The *Jeannette* has departed on her eventful voyage to the mysteries enclosed within the Polar circle, and with her and her brave crew have gone the best wishes of the nation for the successful attainment of the objects proposed. To us as a nation relying more upon individual effort than upon national interference will undoubtedly be awarded the solution of a problem so long sought but never solved. To follow the route of the noble sailors who passed Cape Farewell on the east coast never to return to their homes might have been regarded as unwise if not folly, but the same genius that directed the movements of Stanley in Africa, planned also the present movement upon a scientific theory, carrying with it every possible and probable element of success. Amply provisioned with everything that ingenuity could devise or imagination invent, and manned by tried men and true, the hearty farewell shake of the hand dispelled all doubts of courage and faith in the seaworthiness of the good ship and the successful issue of the voyage.

The numerous currents existing in the ocean have been the cause of the disasters attending former expeditions in search of the northwest passage by way of Baffin's bay. These ocean currents, the great rivers of the sea, move steadily on through waters comparatively tranquil, spreading over hundreds of miles upon the broad bosom of the ocean, not only upon the surface, but also in deep waters, often moving in different directions. The cause of these ocean movements is found in the difference of temperature between the polar and tropical regions acting directly upon the waters, the configuration of the continents exercising a certain controlling force as to direction and variation. The cold and heavier waters of the polar regions tend incessantly to flow into the warm and lighter waters of the tropics, and when both meet the colder waters sink and disappear below the warm waters, which return as *surface currents* towards the polar regions diverted from a perfectly straight course by the steady action of the earth's rotation and by continental obstructions. To illustrate this, place at one end of a glass vessel of suitable dimensions, filled with water, a piece of ice, and apply heat at the other end by means of a spirit lamp; then color the cold water end with carmine and the warm water end with indigo. A current of carmine will immediately flow towards the heated end and meeting warm water will sink, while the blue warm water will flow on towards the cold end, forming continuous currents of carmine and blue, one flowing towards the ice on the surface of the water, the other flowing towards the heat below the surface.

The Gulf stream, which is the current of the North Atlantic, affecting Arctic expeditions in that direction, arises from the accumulation of the waters of the equatorial current in the Gulf of Mexico. It proceeds east until its course is changed to the north by striking against the Bahama Banks. Flowing with great rapidity along the coast of the United States, gradually expanding in volume and diminishing in velocity as it proceeds northward, it turns east at the latitude of New York and crosses the Atlantic to the Azores, when it divides, the main branch returning southward along the coast of Africa, while the northern branch continues its slanting course to the British Isles and Norway. A branch of the gulf stream flows from about the latitude of Newfoundland north towards Iceland, and sweeping around in a semi-circle between Spitzbergen and Lapland, is divided into two branches by impinging against Nova Zembla, thence uniting its streams again in the Kara sea where it is lost in the Polar current. The Polar current, appearing at the eastern boundary of the Kara sea, flows steadily and rapidly around it and within the 80° parallel of north latitude, oftentimes within 7° of the north pole, forming the Polar channel, thence south between President land and Grant land, under the great ice barrier to Hall land, on the extreme northern end of Greenland, whence it is divided into two branches, the one flowing south along the east coast of Greenland, the other south along the west coast of Greenland through Baffin's bay and Davis strait, until reuniting after passing the most southerly point of Greenland it flows on steadily in one great current until it is lost by sinking beneath the gulf stream at or near the latitude of Newfoundland. This outflowing Polar current has been the cause of the failure of former Arctic expeditions on the eastern coast. The ship is either forced back away from the pole by the force of the current, or else locked in the ice, it is floated with it in its southern course out into the Atlantic, the main outlet of the north Polar waters.

Upon the Pacific ocean the great equatorial current, divided by the coasts of Asia and Australia, divides, and sends one branch south, the other flowing north bends to the north and northeast after passing the Phillipine islands and Formosa and becomes the Japanese current (Kuro-Siva), the Asiatic gulf stream. This noble stream, with its vast body of deep blue and warm waters, flows swiftly along the eastern coasts of Japan slanting across the north Pacific to the peninsula of Alaska, one branch sweeping northeast directly through Behring's strait into the Polar sea. Thence sweeping around along the north coast of America to the Arctic islands it unites with the eastern and southern flowing Polar current through the great ice barrier—Barrow's strait, Jones' and Smith's sound—uniting with and forming part of the great Polar current which finds its way to the Atlantic, carrying upon its bosom the ice of the Polar regions. In this current the *Jeannette* will be continually carried onward, east to the Atlantic ocean, as inevitably as she would be carried to the Gulf of Mexico by the current of the Mississippi. Whether frozen in the ice or not, she will be carried east to the Atlantic, or in the direction of the North Pole, by the steady flowing current in that direction. In fact, there *is no current flowing in any other direction.* The Polar currents all crowd to the east on the American coast, under the influence of the earth's rotation, and because the Atlantic is the only outlet, the shallow, narrow passage of Behring's strait preventing them from sinking under the warm Japanese current, so that from the Pacific to the Arctic ocean there is a constant *inflowing current*, and from the Arctic to the Atlantic a constant *outflowing current*, reason enough why the *Jeannette* should succeed if success will ever attend a Polar expedition. The scientific features of the expedition will be of the highest order. No observation will be neglected, whether made by deep sea soundings or in the air, for the benefit of meteorology. Every preparation has been made to provide for the comfort and safety of the men. Electric lights will be used for signaling, and these with 300 miles of wire with telephones, will enable the observers to communicate with the ship at a distance of 450 miles from her, so that sledging parties can report their discoveries or needs to those remaining on the ship. Amply provisioned for three years' voyage as to provisions, and safe for two years as to fuel, the officers and crew feel buoyant and cheerful, expecting nothing but success, in fact, determined to succeed. With six chronometers, chemicals, microscopes, and barometers of a new and perfect make, and a varied and valuable library, the 33 brave men who compose her full complement, will receive a schooling during her long Arctic sojourn, such as it does not fall to the fate of every man to receive. A strong, tight, comfortable ship, battened throughout with felt and canvas, and all iron below decks carefully covered, the fate of the crew cannot be considered hard.

The route after passing Behring's strait will be governed entirely by circumstances—none has been or can be determined upon. The influence of the *inflowing* current will be permitted to determine the direction, for it is expected that this current will solve the problem of the Polar regions. After leaving San Francisco the ship will proceed to Alaska and receive additional supplies from her convoy, and then weigh anchor immediately for Behring's strait. Success to the *Jeannette* and to her mission.

The general course of the Polar current may be traced from the description by reference to the map of the Arctic regions on this page—for the use of which we are indebted to Dr. A. B. Stout, of this city.

CAPT. HOWGATE'S MAP OF THE ARCTIC REGIONS.

FOUR HUNDRED THOUSAND persons are employed on the railroads in this country; 2,000,000 depend upon them for immediate support, and $400,000,000 are annually paid to employes and persons furnishing supplies.

IN searching the premises of the late Mr. Burke, at Clatsop, Oregon, a few days ago, United States bonds to the amount of $3,000, with the coupons for 1880, were found sewed in the garment worn by the daughter.

Alaska as a Mining Field.

In some remarks published by us not long since and directed to a consideration of the proper course to be pursued by the general government in its management of our Alaskan possessions, we urged the policy of encouraging a thorough exploration of that region for deposits of the precious metals, pointing out how speedily it would be overrun by the hardy miners, in the event of either gold or silver being found there in remunerative quantities, and the government thus be relieved from the necessity of protecting the white settlers by the presence of soldiers as well as other care about the future of that country. Since the publication of that article we are in receipt of a letter from a reliable party now operating a quartz mill and mine on the island of Baranoff, and in which a very favorable account is given of the gold-bearing veins in that neighborhood, these, according to this authority, being not only numerous but of good size and promise. These mines are close to Sitka, so near, in fact, that the town is included within the boundaries of the mineral district organized since their discovery.

The finding of the precious metals in this section of the country is not a recent occurrence. They have been known to exist there for many years. The Indians, at the time the country was taken possession of by the Russians, were in the habit of wearing gold and silver ornaments of their own make, the metal having been first pounded from the ore with rocks and afterwards rudely shaped by smelting. Nuggets of gold, some of them of considerable size, have been picked up or pounded from the quartz croppings at various points since the American occupation of the country, and the Hudson Bay Company, as much as ten years ago, shipped from the adjacent Prince of Wales island a quantity of gold-bearing quartz, that on being reduced was found to pay well.

The mines here alluded to are, however, of recent discovery, these lodes having been first noticed by the United States officers stationed at Sitka some five or six years ago. These parties made a number of locations, on which some work was afterwards done. But being little acquainted with this style of mining and unable to cut the gold out of the rock with hatchets, according to their notions of the business, they desisted from its further prosecution, and, upon their being removed elsewhere, the mines suffered temporary abandonment.

Some two years later parties from Portland, Oregon, visiting the country took up what is known as the Stewart mine, formerly owned by and named after Major Stewart, of the army. This party proceeded to open their lode and put up a 10-stamp mill, but the work having been committed to inexperienced hands was so badly performed that the company was forced to employ a more competent superintendent, the party now in charge, who has been compelled to partially reconstruct the mill, which, only within the past month, has been got in condition for active operations. A clean-up has since been had and the quartz found to pay at the rate of a little over $30 per ton, the bullion running about seven-eighths gold and one-eighth silver. The ore may be considered free milling, though carrying a large percentage of sulphurets that require separate treatment.

According to the statements of our correspondent, there are, in the district where he is operating, a great number of auriferous quartz lodes, nearly all of them well formed and of large size, being easily traceable by a bold and well-defined outcrop for a long distance, and from 3 to 10 feet in width. With one exception, no ore has yet been milled from these lodes, but assays made and the prospecting done, denote for them a milling value of about $30 per ton. The natural facilities here for both milling and mining are good, there being an abundance of water, and a superabundance of wood in the district. The whole country is, in fact, so heavily timbered, that it is difficult to get about, or construct wagon roads over it, while they have rain on an average, 20 days in every month. The streams being numerous and never failing, afford ample water power for the propulsion of machinery close to the mines.

From the foregoing it would look as if they might have a considerable extent of vein mines in the locality described, enough, if not to lay a sure foundation for a great mining industry in these north lands, at least enough to serve as a starter. With a mill already in successful operation, backed by resources so considerable, we have a good beginning in this branch of mining. As there is evidently room for more mills in this district, more will no doubt soon be put up there. Indeed, with the footing it has gained, we may consider quartz mining an assured industry in far-off Alaska. It will now be able to go on and take care of itself. But this is not a rapidly expanding and aggressive industry. It is cumbersome and slow of movement, and capable of invading the wilderness but slowly. What is now required to hasten the conquest of these savage lands and peoples, and take from the hands of the Government the heavy charge that now rests upon them of looking after the same, is the discovery, away in these wilds, of paying placers—the swift, rough civilizers, the forerunners of enlightenment, the advancers of frontiers.

But it is an awful country, this that stretches away—indeed, we don't know where! Awful in its extent—almost as big as the whole United States besides—awful in the gloom and solitude of its forests, in its mountains, enveloped in mist and flaming with volcanic fires, and in its majestic rivers flowing into the unknown: A country, the exploration of which even the California prospector should not be expected to undertake without some special aid and encouragement. We therefore here repeat the suggestion made when before alluding to this matter, that the general government extend some assistance to such of our adventurous population as may feel disposed to undertake a trip to Alaska in search of mines and more especially placer deposits. If there are any such in that country this is the way to find them, and once found such a rapid influx of brave and hardy immigrants is sure to follow as will at once relieve the authorities at Washington from any more trouble about it, and convert a now useless and troublesome dependence into a populous and self-sustaining appendage of the government. If Alaska has anywhere in all her icy wastes even a moderate extent of surface diggings, our veteran prospectors will with a little help find their way to them and make them the means of infusing life into that dead and distant Territory. With a colony of miners up there it would not again become necessary for the English to dispatch an armed vessel to Sitka for the protection of American citizens, nor would the latter have cause to longer fear their savage neighbors. Let the government furnish a vessel giving free passage to as many miners as might choose to emigrate to Alaska, carrying also their provisions free and providing means for their return, and we doubt not a sufficient number of the right kind of men would be found ready to embark for that country, and that the results of such policy would prove highly satisfactory to all concerned.

Harvest Field Disaster.

About 3 o'clock Tuesday afternoon the boiler of L. B. Anway's steam thresher, at work near Rio Vista, Solano county, exploded, injuring the fireman, Andrew Larson, so severely that he died within half an hour afterward. As the fireman was in the act of putting straw into the furnace the inside flue collapsed, blowing out the fire-box, the door of which struck him with great force. His clothing was saturated with hot water and steam and his face was somewhat scalded. Mr. Anway, who was standing beside the engine, within two feet of the fireman, says that the steam gauge indicated a pressure of only 85 pounds.

On Wednesday the Coroner's inquest was held, and after hearing the testimony of impartial experts who had examined the boiler subsequent to the explosion, rendered a verdict wherein they found that the explosion was the result of a defective boiler. The engineer testified that there was plenty of water in the boiler at the time of the explosion, and, so far as can be ascertained, no blame is attached to him. Indeed, there was nothing in the evidence sufficient to inculpate anyone. The boiler, it appears, has served in its present capacity since 1873, prior to which time it had been in use on a dredger for a number of years.

FIVE HUNDRED tons of vitriol were recently set free by fire near Boston and emptied into a tributary of the Mystic Water Works. Thousands of dead fish attest the presence of the chemical and the people of Boston are naturally afraid to use the water.

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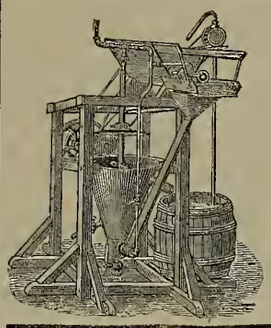

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Orders for Mining and Scientific Books in general will be supplied through this office at published rates.

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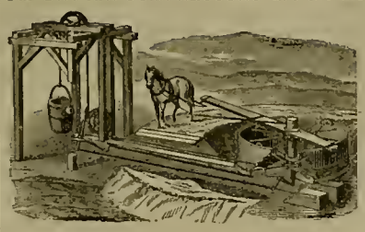
Our DRY AIR COMPRESSORS are the most Economical Compressors in the Market.



MINERS' HORSE-POWER.

This Power is especially adapted to working mines, hoisting coal or building material, etc. It will do the work of a Steam Engine with one-tenth the expense. One Horse can easily hoist over 1,000 pounds at a depth of 500 feet.

The Power is mainly built of wrought iron, and cannot be affected by exposure. The hoisting drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending bucket. The frame of the Power is bolted to bed-timbers, thus avoiding all frame work. When required these Powers are made in sections for packing.

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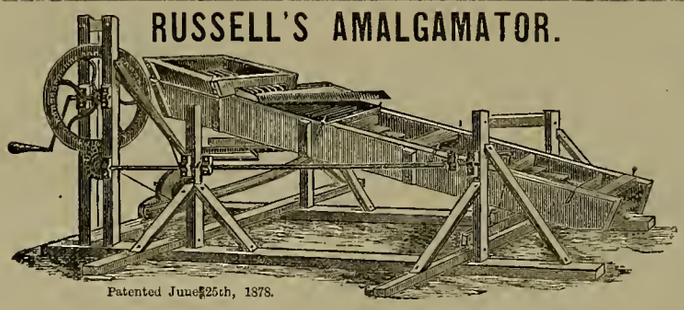

Patented June 25th, 1878.

SAVE YOUR GOLD

And Also SAVE YOUR QUICKSILVER.

The above Washer and Amalgamator with new patent Wire Bridge Quicksilver Boxes attached, can be worked wet or dry, either by hand, steam, horse or water power, and is easily taken apart and packed. For washing Pulp, Earth, Gravel, Mill Tailings or Black Sand, it is without a rival.

Has been Thoroughly Tested and given Complete Satisfaction.

The entire Lining, Hanging Plates, Riffles and Boxes Amalgamated

IS GUARANTEED TO SAVE THE FINEST OR FLOAT GOLD.

Capacity, 30 to 60 tons per day, according to size. For further particulars apply to

J. MORIZIO, Gen'l Agt.,

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SANDERSON BROS. & CO.'S

Best Refined Cast-Steel.

Warranted Most Superior for Drills, Hammers, Etc.

A full and complete stock of this reliable and well-known brand of Steel, for mining and other uses, now in stock and for sale

At No. 417 Market St., S. F., - H. D. Morris, Agent.

In consequence of spurious imitations of

LEA AND PERRINS' SAUCE,

which are calculated to deceive the Public, Lea and Perrins have adopted A NEW LABEL, bearing their Signature, thus,

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which is placed on every bottle of WORCESTERSHIRE SAUCE, and without which none is genuine.

Ask for LEA & PERRINS' Sauce, and see Name on Wrapper, Label, Bottle and Stopper. Wholesale and for Export by the Proprietors, Worcester; Crosse and Blackwell, London, &c., &c.; and by Grocers and Oilmen throughout the World.

To be obtained of CROSS & CO., San Francisco.

C. C. Bitner's Apparatus for Obtaining Metallic Copper from its Solutions.

Patented March 18th, 1879. Will precipitate with steam in three hours, requiring no machinery to run it. Cost of constructing apparatus, $75. The old cylinder process takes four hours to precipitate and costs from $1,200 to $1,500 to construct, besides the machinery to run it. For right to use my Precipitator address O. O. BITNER, Spenceville, Nevada County, California.

507 Mechanical Movements.

Every mechanic Should have a copy of Brown's 507 Mechanical Movements, illustrated and described. Inventors, model makers and amateur mechanics and students, will find the work valuable far beyond its cost. Sold by DEWEY & Co., Patent Agents and publishers of MINING AND SCIENTIFIC PRESS, San Francisco. Price, $1, (post paid.

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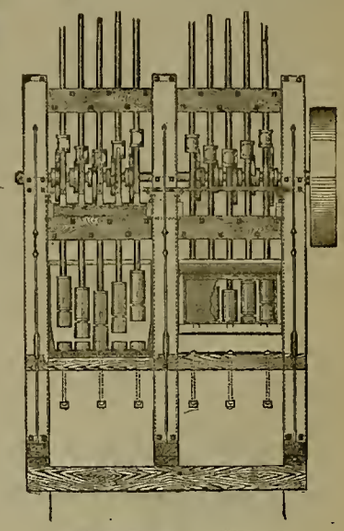
GOLD AND SILVER

Grinding and Amalgamating MACHINERY.

Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver Ores, Chloridizing Furnaces, Retorts, Rock Drills, Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill Supplies.



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Wrought-Iron Frame

FOR STAMP MILLS.

Great saving in time and money over the wood frame. Is made complete with wrought-iron frame ready to put upon the foundation, requiring no skilled millwright. These mills are unsurpassed in excellence in every particular.

We are furnishing all the Machinery for a 10-Stamp Gold Mill, including Crucible, Steel Shoes and Dies, Boiler and Engine, Counter Shafting, Pulleys, etc., Stamps weighing 450 lbs. each, with Copper Plate inside of the Mortars, and for tables outside, making all the Machinery complete for a 10-Stamp Mill for the sum of

$2,250.

We construct Mills with Stamps weighing from 350 to 900 lbs. for gold or Silver Ores. Wet or dry Crushing Mortars. Will contract to erect complete Gold and Silver Mills on the most improved plans. We have 30 years' experience in mining and milling Gold and Silver Ores, and can compete with the world. Send for a circular. Address

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(Successors to THOMSON & PARKER.)

Engineers and Machinists.

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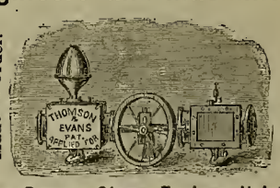

All Sizes of Gas and Tube FLANGES.

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Plans and Specifications for Machinery furnished. Repairing promptly attended to.

110 & 112 Beale St., San Francisco.

THE IMPROVED O'HARRA

CHLORIDIZING FURNACE.

Patented Sept. 10th, 1878.

Now in Operation at the Extra Mining Co.'e Works, Copper City, Shasta Co., Cal.

Two men and two cords of wood roast

Forty Tons of Ore in Twenty-four Hours,

Giving a full chlorination (100%) at a cost of 30 cents per on. Address,

O'HARRA & FERGUSON,
Furnaceville, Shasta Co., Cal

Or CHAS. W. CRANE, Agent,
Room 10, Safe Deposit Building, San Francisco

Dewey & Co {202 Sansome St.} **Patent Ag'ts**

Continued from page 21.

the Banker lode, towards the east line of Messrs. Smith & Kessler's claim, and bearing off in a southwesterly direction, was struck last month. A shaft sinking on it is 35 ft deep, following the vein which dips southward at the same angle as the main lode. The spur carries 18 inches of very good ore. The Silver Bow mill has taken a trial contract of reducing 100 tons of Lexington ore. The main shaft of the Alice at date is 480 ft deep, and is going down very slowly through extremely hard syenite. Thirty ft of sinking must yet be done to reach the 500-ft station and give the 10-ft sump required below it—a task which cannot be completed much before the first of next month. At the estimated rate of progress the ledge will be reached on the 500 level sometime in October. Shaft No. 2 of Late Acquisition lode is in 40 ft and on a 26-inch vein of good ore. The Clear Grit claim shows a 30-inch vein of high-grade ore following footwall, and low grade 10 ft in width towards the hanging wall. The ore mills about 80 ounces per ton.

OREGON.

JACKSONVILLE.—*Times*, July 4: The Grand Applegate company is now engaged in piping. The Squaw Lake company is still piping away with good effect. Hein Deneff, mining on Farmer's flat, last week, picked up two pieces of gold weighing nine ounces. The miners of Josephine county still have a fair supply of water, but some of them will commence cleaning up soon. Jacob Klippel, Thomas Keaton and Henry Weber are now engaged in ground sluicing on Elliott creek, with fair prospects. The mining season has come to a close in Willow Springs district, the last miner, T. L. Beck, having suspended operations this week. The news from Silver creek is favorable, many of the miners there making good wages. Water is said to be failing at Briggs' creek since warm weather set in. Several of the miners on Sterling creek have just completed ground sluicing and are cleaning up, Kleinhammer & Co. among the number. The run has been a fair one. Beck Bros., on Big Applegate, have completed their ditch, which is about three miles long, and will commence active mining operations forthwith. Their ground is said to prospect well. They are to be complimented on their enterprise, which deserves success.

UTAH.

BINGHAM.—*Tribune*, July 4: Considerable work has been done to show up the vein in the Red River, situated near the old Spanish mine. At a depth of 100 ft the vein averages 25 ft, assaying from $8 to $15 in gold. A tunnel has been run about 75 ft, showing the vein about 18 ft wide, with similar assays to the last mentioned. Another tunnel has tapped the vein 200 ft from the mouth, which averages about 15 ft. Several drifts have also been run, all bearing evidence of a large deposit of ore in close proximity. This mine is on the gold belt. Jordan & Foley are working the Saturn. This mine has heretofore turned out considerable ore. MacManamy & Williams are working and piling out ore from the Gem. Recently they made a considerable shipment. Householder & Jones' mine is called the Stewart No. 3, and is close beside the No. 1. It assays well and bears every evidence of a well-defined ledge. The Stewart company No. 2 have got their mill erected and anticipate being ready for operation in the course of three weeks. The building has been erected with a view to permanency and durability. The machinery is first-class and no expense has been omitted to make it a thorough success. Twenty stamps will be used, but no doubt they will have soon to enlarge their capacity. The mine is looking all that could be wished. Large bodies of high-grade ore are now in sight and further developments only prove the immense deposit of gold-bearing ore. The main tunnel is now in over 200 ft, and though not yet into the main ledge, some flattering assays have been made. From present indications the vein may be cut at any time and precipitate the owners into a huge deposit. The Stewart No. 1 still keeps up its reputation. Considerable improvement has lately been made in the mill in the way of new machinery, etc. The mine is looking as good as ever, and though a draw is made upon it of some 50 to 90 tons in 24 hours, it does not appear to have much effect in lessening the quantity of ore.

Professor Nordenskjold.

In the latter part of May last, dispatches were received in San Francisco from Berlin, via New York, to the effect that Prof. Nordenskjold, the Swedish explorer, had escaped from the Arctic ocean by the way of Behring's straits, and was on his way home, in the *Vega*, via Suez canal. Since that time no confirmatory reports have come to hand of his arrival in Japan, and many people have concluded that he was not seen upon the Siberian coast near the point the Esquimaux claim to have had a sight of his vessel. Late Stockholm papers, received at the office of the Alaska Fur Co., in this city, make clear what has heretofore been shrouded in mystery. The first dispatch is from Governor Schamarin, of Siberia, to a gentleman in St. Petersburg, dated at Iakintsk stating that he has letters from Nordenskjold to the effect that on the 16th of September, 1878, he was caught in the ice in latitude 67° 3′ north, longitude 171° 33′ west, quite near to the shore, and that, as it was so early in the season, "he had hopes of getting through Behring straits, and reaching home, via Suez canal, before spring." This telegram has never been correctly given before, and in translating it what the Professor gives as a "hope," is rendered as a fact. The very latest in regard to the whereabouts of the *Vega* comes in the columns of a St. Petersburg paper. It is a dispatch from Governor Schamarin, dated Iakintsk, May 26th, stating he had a letter from Prof. Nordenskjold, informing him that he had drifted down the coast some distance, and was, at the time of dispatching the messenger, located about 120 miles to the westward of East Cape. He had plenty of provisions and fuel, and had no fear but that he should work his way out safely with the breaking up of the ice this spring. This situation of the *Vega* confirmed the report brought to this port by Capt. Camphell, of the whaling bark *Norman*, which left St. Lawrence Bay on the 22d of October, who stated that a party of natives had just come in who said they had seen the spars of a ship near the shore at that point. It is a little singular that such a misconception of Governor Schamarin's first dispatch, as has been pointed out, should have misled the entire press. The probability is that the *Vega* will have worked her way out before the *Jeannette* arrives in the Arctic; and even now she may be on her way to Japan.—*Call.*

UP to the present time $10,523,574 has been expended in the construction of the Brooklyn bridge.

The Great Western Quicksilver Mine.

EDITORS PRESS:—In your valuable paper of July 5th, I have read au article on the "Great Western Quicksilver Mine," by "B. W. C.," parts of which are liable to give your readers erroneous impressions.

He says: "Among the first, if not the first mine now being worked for mercury is the Great Western." Now it is not presumed your correspondent intended to convey the idea that this mine was the "first mine" being worked for mercury, but rather that it is the most valuable. Now, all who know the property will agree that it is a very valuable mine, but to say it is the "first" in value, or even "among the first" is scarcely nearer the fact than to say it is the first mine worked for mercury.

I find the Great Western has produced from 1875 to 1879 (about all her record) 18,930 flasks of quicksilver, an average of 4,732 flasks per annum. The New Almaden produced the same years 73,500 flasks, or an average of 18,375 per annum. This mine has a record of 26 years, producing in that time 649,525 flasks, an average of 24,905 flasks per annum, and has produced in one year (1865) 47,193 flasks of mercury. It will not be questioned that this is a first-class mine. Of other California mines worthy of note may be mentioned the Guadalupe, which produced from 1875 to 1879, 26,384 flasks, or 6,596 flasks per annum; the Redington mine produced in the same four years 33,301 flasks, or 8,325 flasks per annum; the Sulphur Banks produced in 1876 to 1879, 28,510, or an average of 9,503 flasks per annum. These three mines are good second-class mines. If we should consider foreign mines, the Almaden of Spain is only worked about six months of the year and produces more mercury than the New Almaden, and could easily produce as much as all the California mines together.

Of the Great Western reduction works he says: "The principal extracting of quicksilver is done by one fine ore furnace of the capacity of 13 tons in 24 hours, and three coarse ore furnaces, each of a capacity of 35 tons in 24 hours. Of the coarse ore furnaces, two are Green's excellent furnaces—one of Coult's—patented in 1867 by Joseph Coult, then of Pope valley, but now of Texas. This furnace gives the best, easiest and cheapest results: does not cost one-fourth as much as the others—$5,000 will put up two of them with condensers."

It has been asserted by one of our men of genius, that "a rose by any other name will smell as sweet," and he might have added that a furnace will do just as good work whether it is called "Green's excellent furnace," "Coult's," or any other name, but the construction of the furnace is the vital point. It may be unknown to your correspondent that "Green's excellent furnace" has been adjudged by a jury of 12 good and intelligent men to be a broad infringement of the Knox and Osborn patent, and that a heavy judgment is now standing against this mining company for this very infringement. But this learned correspondent informs your readers that one "Joseph Coult, then of Pope valley, but now in Texas, patented in 1867, a furnace." He did truly, and built it the same year, and set it up, and attempted to work it in the spring of 1868, and the attempt proved a most disastrous failure, the furnace never having produced a pound of quicksilver nor reduced a pound of cinnabar; but did reduce the the inventor to a state of bankruptcy, after repeated alterations and additions, all of which were unsuccessful in improving the utterly worthless concern. The so-called "Coult" furnace built at the Great Western mine, has no resemblance in form, size, principal and manner of working, or in any other respect to the furnace patented by Joseph C. Coult in 1867, and no more resembles the furnace said Coult built in 1867-8, than does an Indian wigwam the palatial residence of "Nob Hill."

Your correspondent further states that all is "under the able management of the experienced mining engineer, Andrew Rocca. Mr. Rocca is a progressive and practical man, and has introduced many new, original and practical ideas in his various machines. His glass-roofed condensers are proving a perfect success." If your correspondent had looked upon the glass-roofed condensers closely, he would have seen that the "original and practical ideas" incorporated in those really excellent condensers, like the excellent furnaces, the invention of another man whose legal notice of his invention, *with his name*, is there conspicuously posted. I heartily endorse the "able management" of this mine by Mr. R., who took it with scarce a month's supply of ore in sight and has worked it up to its present capacity, and notwithstanding the very large amount of *dead* work done, has always made it pay much more than expenses, notwithstanding the very low price of quicksilver.

This happy condition of the company your correspondent attributes to "the flow of metal from the furnaces, that has not ceased for the last three years, yielding 500 to 600 flasks per month, or about 7,000 to 8,000 flasks per annum." These last statistics given by your correspondent will convince the most skeptical that although he may be unable to *see* a conspicuous notice posted on the "original and practical" machinery, he can see (nearly) double when he comes to counting flasks of quicksilver. But in describing the machinery for reducing the fine ore, your correspondent sums up and makes all clear by stating that "the fine ore condenser uses a Livermore condenser," which lucid explanation clears up everything heretofore unexplained, and renders further comment superfluous. A WORKMAN.

News in Brief.

PORT-AU-PRINCE, Hayti, is in flames and all business suspended.

THE potato bug is doing much damage in upper St. John, N. B.

THE strength of the Egyptian army has been fixed at 12,000 men.

CALIFORNIA and Consolidated Virginia pass dividends this month.

MUTINIES and revolts prevail in Mexico, and a reign of terror exists.

A RAILROAD is about to be constructed across the Australian continent.

THERE are 7,000 more colored residents than whites in Charleston, S. C.

MANY persons in England have been poisoned by licking postage stamps.

THE Chinese have taken Kashgar. Now let somebody take the Chinese.

THERE are 300,000 seamen employed on the rivers and lakes of the West.

SZEGEDIN, Hungary, cannot be rebuilt this year, owing to the high water.

NOT one of the Imperial Napoleons has died in France, or upon French soil.

YELLOW FEVER is raging in epidemic form in nearly all the South Atlantic islands.

IN Texas there are 30,000 white children over eight years of age who cannot read.

SIGNOR CAIROLI has been intrusted with the task of forming a new Italian Cabinet.

ON June 22d a monument to Boccaccio is to be unveiled at his birthplace, Certaldo.

SILVER in London, 51⅜; consols, 98 1-16@98⅛; 5% U. S. bonds, 106; 4s, 104⅝; 4½s, 108⅞.

THE devastations committed by grasshoppers in southern Siberia is said to be appalling.

A MAN cannot fight well when down, but a cucumber does its best fighting when down.

A NASHVILLE man has just received from England four dogs which cost him $1,000 each.

THE sum of $31,000 was presented to Mr. Spurgeon on his completion of a pastorate of 25 years.

A CHINAMAN'S queue shall not be cut off, but a white man's hair shall be. The U. S. Court says so.

A SINGING canary in a cage is the most recent novelty offered as a premium by a religious newspaper.

SAN LUIS PARK, Colorado will be the toll gate of the confluent lines of way travel of the unified nations.

LAST Monday was the 32d anniversary of the raising of the Bear flag, and the first election of officers in San Francisco.

IN the museum in the Ordnance Bureau at Washington are the pistol and the bullet with which Booth shot Lincoln.

THE first car wheels manufactured in this State, south of San Francisco, have just been turned out by a Los Angeles house.

LIEUT. CAREY who was with the Prince Imperial on his ill-fated trip, is to be court-martialed for not stopping the Zulus.

THE population of Guaymas is 7,000, and of Hermosillo, 12,000. The distance from Guaymas to the boundary line is 250 miles.

SIX THOUSAND Chinamen are at work on the Texas Pacific railroad. Gov. J. C. Brown declared that none should work on that road.

IN San Francisco half dollars are quoted at 99 buying, 99¼ selling; trade dollars, 98 buying, 98 selling; Mexican dollars, 93 buying, 93 selling.

GLASS, the product of silica and an alkali, was known prior to 3,000 B. C.; made in Alexandria, and cut, colored and gilded 300 years B. C.

IN New York Government bonds are quoted at 101⅞ for 4s of 1907; 103⅝ for 5s of 1881; 106⅛ for 4½s; sterling, $4.86½@4.88½; silver bars, 113¼; silver coin, ⅜@1 discount.

THE stomach daily produces about nine pounds of gastric juice for the digestion of the food; its capacity is about five pints.—*Ex.* [Nine pounds ought to be enough without any other food.]

THE cause of the unity and uniformity of our population and of our exalted and permanent civilization is due to the fact that North America is concave in its structure, while other continents are convex.

THE new steel bridge over the Missouri river, at Glasgow, Mo., is the finest bridge of the kind in the world. It is nearly 500 feet long, and every strand is warranted to bend double before it will break.

ALTALA BAY, at the junction of the river Colican and the Gulf of California, is to be the terminus of a railroad instead of Guaymas. The harbor is well protected and the water 60 feet deep at low tide.

New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's office at San Francisco:

LAST CHANCE M. Co.—Object: To operate in Mono county. Capital, $6,000,000. Directors—S. Lubeck, F. R. Bechtel, George Osgood, P. G. Childs and Robert Barton.

CALIFORNIA AND NEVADA MILL AND MINING Co.—Object: To operate in Napa county. Capital, $10,000,000. Directors—Lewis Reynolds, A. B. Grosh, Alexander McKenzie, George Burgess and Thomas H. Reynolds.

CENTENNIAL M. Co.—Object: To operate in Bodie district. Capital, $10,000,000. Directors—M. L. McDonald, W. H. Sharp, S. F. Gashwiler, L. Grecnebaum and George W. Smiley.

Stockton Industry, Etc.

EDITORS PRESS:—With your permission and a space in your valuable columns, I will strive to give you a few items of the progress of this city and its leading manufacturing establishments, warehouses, Grangers' and Co-operative Unions, etc., which a short sojourn and limited acquaintance has placed within my reach.

The corporate limits of the city proper run between four and five miles; its streets run at right angles, dividing the city into blocks of 300 feet square. Stockton, with its immense warehouse facilities, makes successful bids for the farmers' grain, and stores it at small percentage. From a town of tents in 1849, it is now placed in the fifth rank as to population (14,000 to 15,000). As a commercial center Stockton has few rivals and no peers. She heads the list of the grain markets on the Pacific Coast. From the close proximity of the capacious warehouses to navigable water, its grain can readily be placed on board of steamers and sailing vessels, and in the bay of San Francisco be transferred to ships for the foreign and domestic market, thus saving the enormous wharf tax in San Francisco. The different warehouses have the following storage capacity: Farmer's Co-operative Union, 15,000 tons; Baggs', 12,000 tons; Stockton, 20,000 tons; Farmers', 10,000 tons; Kalisher, 8,000 tons, and many other buildings used for storing grain during the season. The people of Stockton look healthy, wealthy and prosperous. The farmers as a class come to the city more or less, especially Saturdays, when they bring their wives, daughters and children and let their hard earned twenties take the wing. Many of the farmers have, by honest and upright industry, earned a competent living, and do not allow themselves or their families to want for the real comforts of this world. Their money is honestly come by, and they spend it freely for anything that will tend to their comfort and solid pleasure; neither do they forget or neglect the worthy poor. No man, woman or child leaves their door hungry or thirsty. These citizens of the soil are the ones that impart the great progress and prosperity to this, "the City of Windmills."

Matteson & Williamson,

Patentees and manufacturers of agricultural implements, corner Main and California streets. This house was established in 1852, at which time Mr. Matteson began to manufacture in this city. Thirteen years ago Mr. Williamson entered the firm, changing the name to Matteson & Williamson. This house manufactures, among other implements, Richards' improved header, canal and railroad plows, scrapers, the famous sulky iron gang plow, "American Chief," horse, hay and grain forks, threshing and stacking derricks, two-edged patent diamond plow, patent chisel cultivator, the base single or sulky tule plow. This firm is now prepared to manufacture any and every article that is necessary in the agricultural implement line. With a force of 30 to 40 (including some of the most skillful mechanics on this side of the Rocky Mountains), leaves this institution excelled by none in workmanship and durability of their manufacture. During the past year they have erected a three-story brick building, where the blacksmith and wood work is done; recently they have completed a foundry, fronting on Aurora, bounded by Main, Market and Grant streets; working capacity, 50 square feet. About a week ago their first castings were turned out, with entire satisfaction to the proprietors. This enterprising firm has established a reputation which reaches far and wide; they fill orders from all parts of California, also from Oregon, Nevada, Washington Territory, Idaho, Montana, Nebraska, etc. Their improved workshops are among the finest on the Pacific Coast.

Marsters' Feeder Works, and Regulating Windmills,

Corner California and Washington streets. Mr. E. J. Marsters has been engaged for the last five years in manufacturing the "self-feeder" of a pattern invented by himself, which has been improved from time to time. Four years of practical experience has given it a standard reputation, until now it stands acknowledged head of the list for simplicity, effectiveness, light-running, durability and ease in putting on and taking off, for which testimonials too numerous to mention in these columns for want of space, can be furnished on application to the above works. Marsters' self-regulating windmill, "Tempest," the most substantial self-regulator in the county and State. Its mechanism is of the simplest character, no weights, springs or levers are used in its construction, the solid or banded wheel employed so favorably known, renders it at once reliable and worthy the attention of our people. Marsters' Universal Regulator, especially designed for regulating mill's constructed on different styles of turn-tables. This regulator is easily adjusted to old mills requiring the same. Parties desiring new mills or having old ones to repair and regulate, would do well to call at the above works.

Globe Iron Works,

Corner Commerce and Main streets. One of the earliest and most important manufacturing establishments of this city. Established in 1857 by E. J. Keep. Mr. John Cain is the present owner. Steam engines, machinery and castings of every description are manufactured in these works. A specialty is made of Root's rotary patent force-blast blowers for ventilating mines, and portable forges, Harshberger's patent wheat scourers (smut mills), and all kinds of agricultural implements. Connected with the Globe Iron Works and under the same ownership is the

Stockton Agricultural Warehouse,

201 and 203 El Dorado street, near Main. Mr. John Cain is the successor to the "H. C. Shaw Plow Co.," which was incorporated December, 1875. There is on hand a large and full assorted stock of standard and late patents of mowers, headers, wagons, engines, etc.; in fact everything in the line of agricultural implements. They also own or control the patent and trade of the

Stockton gang plow and of the Stockton single-gear header, both in use throughout the State.

Grangers' Union of San Joaquin Valley.

This Union was incorporated May 14, 1874. Its members can be numbered among the most substantial men of Stockton, San Joaquin county and valley, most of whom are practical farmers. In its infancy they occupied a building on El Dorado street. October 1st, 1876, they moved into an elegant brick building, specially built for their own use. The building fronts on Main street, and has a large and fine entrance on California street. The floor contains 11 500 square feet. This Union does a large business and carries a heavy stock of goods, a full assorted line of agricultural implements, iron, steel mechanical and blacksmiths' tools, wagons, hardware, rope, paints, oils, belting, etc., etc.; fu fact everything that man and mind can imagine is kept in this popular and well managed establishment. The Grangers' Union is deservedly popular, well officered, ably managed, upright and prompt in all its dealings, and it is certain to be and remain a shining landmark in the rich and fertile San Joaquin valley. The originators of this institution may justly feel proud of their enterprise.

Pacific Agricultural Works,

Lafayette, between California and Sutter streets. The above works were established in 1875 by Messrs. G. Lissenden & Co. Both proprietors, Mr. Lissenden and Mr. H. C. Norris, are practical mechanics and supervise their shops personally. This establishment turns out all kinds of late improved agricultural implements. They also repair all kinds of farming machinery as well as manufacture the same. A specialty is made of the sulky plows "Star of California," the riding gang plow "Star of the West," and McCall's mammoth road scrapers. The celebrated header, thresher and separator is manufactured by Lissenden & Co. This establishment gives employment to 15 or 20 men, and is doing a large and extensive business. Prompt attention, work of durability and fair dealing has given these gentlemen a far and wide reputation in their line of business.

Davis' Windmills.

For twenty years Mr. J. S. Davis has been engaged in manufacturing windmills of a patent invented by himself. He has from time to time made great improvements on these mills, until now it ranks first on this coast. The principal advantage possessed by Mr. Davis' mill is that the wind acts with equal force upon the whole length of the fan at all times. For the last eight years Mr. D. has made and sold an average of sixty mills per year. The celebrated Compound Hay Press is also manufactured by Mr. Davis. This press has a good reputation among farmers and gardeners. Prompt attention is given to repairing and regulating old as well as new windmills, hay presses, etc. Twenty-five years of practical experience give Mr. Davis great advantage in his line of business. His shops are situated west side of Commerce, between Main and Levee Sts.

There are quite a number of manufactories and factories of note that want of space will not allow me to give a detailed account of. Carriage manufactory of Wm. P. Miller, cor. California and Channel Sts.; carriage manufactory of M. P. Henderson, cor. Weber Avenue and California St.; planing mill of White & Thomas, Hunter, bet. Main and Market Sts.; chair factory of A. Wilder, Main St., cor. California; Stockton City Mills (flour), Sperry & Co.; Stockton Paper Mills; Stockton Woolen Mills; Pioneer Planing Mill; Pioneer tannery; City tannery; Lane's Mills (flour); Stockton furniture manufactory, H. S. Ficketi & Co., proprietors. In conclusion, I will say that in view of the existence of these fruitful enterprises of progressiveness in this city, it must necessarily follow and be a guarantee to the outsider that to honest toil and staunch perseverance alone can this fruitful result be ascribed to.

Stockton, San Joaquin Co., Cal. J. W. H.

PROMPT AND SUCCESSFUL.—*Messrs. Dewey & Co:*—Gentlemen: Your Circular letter, 12th inst., informing me of successful termination of my application for patent received. Please accept thanks for the prompt and successful manner in which you have managed this business Yours respectfully, J. H. CAVANAUGH
Walla Walla, Dec. 24th.

HOW TO STOP THIS PAPER.—It is not a herculean task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

FRESH attractions are constantly added to **Woodward's Gardens**, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

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Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & CO.]

SAN FRANCISCO, July 9, 3 P. M.

SILVER 37½@12½.

GOLD BARS, 8⅝@910. SILVER BARS, 8@19 ⅌ cent. discount.

EXCHANGE on New York, 20, on London bankers, 49¼@49¾. Commercial, 50; Paris, five francs ⅌ dollar; Mexican dollars, 92@95¾.

LONDON Consols, 97 13-16; Bonds (4%), 104¾.

QUICKSILVER in S. F., by the flask, ⅌ lb, 33½c.

GENERAL MERCHANDISE.

[WHOLESALE.]

WEDNESDAY M., July 9, 1879.

CANDLES.
Crystal Wax.....17 @ —
Eagle.....12 @ —
Patent Sperm.....30 @ —

CANNED GOODS.
Assorted Pie Fruits,
2½ lb cans.....2 25 @ —
Table do.....3 50 @ —
Jams and Jellies..3 75 @ —
Pickles, hf gal.....3 25 @ —
Sardines, qr box..1 67½@1 90
Hf Boxes.....2 50 @2 75
Preserved Beef,
2 lb. doz.....4 00 @ —
do Beef, 4 lb, doz.6 50 @ —
Preserved Mutton,
2 lb. doz.....4 00 @ —
Beef Tongue.....6 50 @ —
Preserved Ham,
2 lb. doz.....6 50 @ —
Deviled Ham, 1 lb,
doz.....5 50 @ —
do Ham, ½lb doz.3 00 @ —

COAL—Jobbing.
Australian, ton..6 00 @ 6 50
Coos Bay.....— @ 5 50
Bellingham Bay. — @— —
Seattle.....5 50 @ 6 00
Cumberland.....12 00 @15 00
Mt Diablo.....4 75 @ 5 00
Lehigh.....11 50 @12 50
Liverpool.....6 00 @ 6 50
West Hartley... — @ 8 00
Scotch..... — @ 8 00
Scranton..... — @— —
Vancouver Id... 6 00 @— —
Charcoal, sack... 75 @— —
Coke, bush..... 60 @— —

COFFEE.
Sandwich Id, lb. — @— —
Costa Rica..... 16 @ 18½
Guatemala..... 15 @ 16½
Java..... 25 @— 26
Manila..... 17 @— —
Ground, in cs... 25 @— —

FISH.
Sac'to Dry Cod.. — @ 4
do in cases.. 5 @ 6
Eastern Cod....— 7 @— 7½
Salmon, hbls.... 8 00 @ 9 00
Hf bbls..... 5 00 @ 5 50
1 lb cans..... 1 10 @ 1 12½
Pkld Cod, hbls..22 00 @— —
Hf bbls..... 11 00 @— —
Mackerel, No. 1.
Hf Bbls..... 9 50 @10 00
In Kits..... 1 85 @ 2 10
Ex Mess..... 3 25 @— —
Pkld Herring, bx 3 00 @ 3 50
Boston Smkd H'g 70 @— —

LIME, Etc.
Plaster, Golden
Gate Mills.... 3 00 @ 3 25
Land Plaster, tn 10 00 @12 50
Lime, Sta Cruz
bbl..... 1 25 @ 1 50
Cement, Rosendale..... 2 00 @ 2 25
Portland..... 4 00 @ 4 50

NAILS.
Assorted sizes, keg 2 70 @ 2 75

OILS.
Pacific Glue Co's
Neatsfoot, No 1.1 00 @ 90
Castor, No 1.....1 35 @ —
do, No. 2.....1 30 @ —
Baker's A A.....1 25 @1 30
Olive, Plagniol...5 25 @5 75
Poissel.....4 75 @5 25
Palm, lb..... 9 @ —
Linseed, Raw, bbl. 78 @ —
Boiled..... 80 @ —
Coconut..... 55 @ —
China nut, cs..... — @ 65
Sperm.....1 40 @ —
Coast Whale..... — @ 32½
Polar ..... — @ 35
Lard..... @ 70
Oleophine..... 22 @ 27½
Devoe's Brll't.... 17½ @ 18
Photolito..... — @ —
Nonpareil..... 31 @ 32½
Eureka..... 18 @ 42½
Barrel Kerosene... 20 @ —
Downer Ker..... 35 @ —
Elaine..... 37½@ —

PAINTS.
Pure White Lead. 8 @ 8½
Whiting..... 1½@ —
Putty..... 4 @ 5
Chalk..... 1½@ —
Paris White..... 2½@ —
Ochre..... 3½@ —
Venetian Red..... 3½@ —
Averill Mixed
Paint, gal.
White & tints...2 00 @2 40
Green, Blue &
Ch Yellow.....3 00 @3 50
Light Red.....3 00 @3 50
Metallic Roof...1 30 @1 50

RICE.
China, Mixed, lb.. 4½@ 5
Hawaiian..... 6 @ —

SALT.
Cal. Bay, ton....15 00 @22 50
Common.....10 00 @12 00
Carmen Id.....12 00 @14 00
Liverpool fine...19 00 @— —

SOAP.
Castile, lb..... 8 @ 15
Common brands.. 4½@ 6
Fancy brands..... 7 @ 8

SPICES.
Cloves, lb..... — @ 45
Cassia..... 19 @ 20
Nutmegs..... 85 @ 87½
Pepper Grain..... — @ 12
Pimento..... 19 @ 20
Mustard, Cal., ½ lb glass..... — @1 25

SUGAR, ETC.
Cal. Cube, lb..... — @ 10½
Powdered..... — @ 10¾
Fine crushed..... — @ 10½
Granulated..... — @ 10
Golden C..... — @ 8½
Cal. Syrup, kgs... 70 @ —
Hawaiian Molasses 26 @ 30

TEA.
Young Hyson,
Moyune, etc..... — @ 51
Country pckd Gunpowder & Imperial..... — @ 42½
Hyson..... 30 @ 35
Fooo-Chow C..... 35 @ —
Japan, 1st quality 40 @ —
2d quality..... 20 @ 25

METALS.

[WHOLESALE.]

WEDNESDAY M., July 9, 1879.

IRON.—
American Pig, soft, ton.....23 00 @26 00
Scotch Pig, ton.....25 50 @26 50
American White Pig, ton.....23 00 @— —
Oregon Pig, ton.....26 50 @— —
Refined Bar..... 2½@ 3½
Horse Shoes, keg..... 5 00 @— —
Nail Rod..... @— 7
Norway, according to thickness..... 6½@ 7
COPPER.—
Sheathing, lb..... 34 @ 35
Sheathing, Yellow..... 19 @ 20
Sheathing, Old Yellow..... — @—
STEEL.—
English Cast, lb..... 16 @ 17
Black Diamond, ordinary sizes..... 16 @— —
Drill..... 16 @ 17
Flat Bar..... 16 @ 19
Plow Steel..... 8 @
TIN PLATES.—
10x14 I C Charcoal..... 8½@ 9
10x14 I C Coke..... 7 @ 7½
Banca Tin..... 18 @— 20
Australian..... 15½@ 17
ZINC.—
By the Cask..... 9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb, less than cask.. 9½@— 10
NAILS.—
Assorted sizes..... 2 90@3 00

LEATHER.

[WHOLESALE.]

WEDNESDAY, M., July 9, 1879.

Sole Leather, heavy, lb..... 22 @ 29
Light..... 20 @ 24
Jodot, S Kil, doz.....48 00 @56 00
11 to 13 Kil.....65 00 @76 00
14 to 19 Kil.....80 00 @90 00
Second Choice, 11 to 16 Kil.....55 00 @70 00
Cornellian, 12 to 16 Kil.....57 00 @67 00
Females, 12 to 13 Kil.....63 00 @67 00
14 to 16 Kil.....71 00 @76 00
Simon Ullmo, Females, 12 to 13 Kil.....58 00 @62 50
14 to 15 Kil.....66 00 @70 00
16 to 17 Kil.....72 00 @74 00
Simon, 18 Kil.....61 00 @63 00
20 Kil.....65 00 @67 00
24 Kil.....72 00 @74 00
Robert Calf, 7 and 9 Kil.....35 00 @40 00
Kips, French, lb..... 1 00 @ 1 35
Cal. doz.....40 00 @60 00
French Sheep, all colors..... 8 00 @15 00
Eastern Calf for Backs, lb..... 1 00 @ 1 25
Sheep Roans for Topping, all colors, doz..... 9 00 @13 00
For Linings..... 5 50 @10 50
Cal. Russet Sheep Linings..... 1 75 @ 4 50
Oak Legs, French Calf, pair..... 4 00 @— —
Good French Calf..... 4 00 @ 4 75
Best Jodot Calf..... 5 00 @ 5 25
Leather, Harness, lb..... 15 @ 38
Fair Bridle, doz.....48 10 @72 00
Skirting, lb..... 33 @ 37
Welt, doz.....30 00 @50 00
Buff, ft..... 33 @ 21
Wax Side..... 07 @ 80

LUMBER.

WEDNESDAY M., July 9, 1879.

CARGO PRICES OF REDWOOD.
Rough, M.....13 00
Refuse..... 9 00
Clear..... 23 00
Clear Refuse..... 13 00
Rustic..... 23 50
Refuse..... 18 00
Surfaced..... 20 00
Refuse..... 14 00
Flooring..... 20 00
Refuse..... 12 00
Beaded Flooring..... 23 00
Refuse..... 13 00
Half-inch Siding..... 16 00
Refuse..... 14 00
Half-inch Surfaced..... 20 00
Refuse..... 14 00
Half-inch Battens..... 16 00
Pickets, Rough..... 11 00
Rough, Pointed..... 12 50
Fancy, Pointed..... 18 00
Shingles..... 1 75

PUGET SOUND PINE
RETAIL PRICE.
Rough, M.....18 00
Fencing..... 18 00
Flooring and Step..... 28 00
Narrow..... 30 00
2d quality..... 25 00
Laths..... 3 50
Furring, lineal ft.....

REDWOOD.
RETAIL PRICE.
Rough, M.....18 00
Refuse..... 14 00
Pickets, Rough..... 15 00
Pointed..... 16 00
Fancy..... 22 50
Siding..... 20 50
Surfaced & Long Beaded 30 00
Flooring..... 30 00
Rustic, No. 1..... 30 00
Battens, lineal ft.....
Half-inch Surfaced..... 30 00
Shingles M..... 2 00

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending July 8, 1879.

HIGHEST AND LOWEST BAROMETER.

July 2	July 3	July 4	July 5	July 6	July 7	July 8
29.961	29.842	29.958	30.013	30.011	29.945	29.996
29.875	29.772	29.876	29.943	29.917	29.905	29.946

MAXIMUM AND MINIMUM THERMOMETER.

59	65	65	68	60	62	62.5
52	53	51	52	52	52	53

MEAN DAILY HUMIDITY.

77.3	78.3	66.3	61.3	80.7	81.7	85.3

PREVAILING WIND.

SW	W	W	W	W	W	W

WIND—MILES TRAVELED.

232	287	239	225	309	364	189

STATE OF WEATHER.

Fair.	Clear.	Clear.	Clear.	Fair.	Cloudy	Fair.

RAINFALL IN TWENTY-FOUR HOURS.

						.01

Total rain during the season, from July 1, 1878, 0.01 in

The Mechanics' Fair Daily.

By authority of the BOARD OF MANAGERS OF THE MECHANICS' INSTITUTE FAIR the publishers of the MINING AND SCIENTIFIC PRESS will issue a large edition of the TENTH VOLUME of the MECHANICS' FAIR DAILY during the FOURTEENTH INDUSTRIAL EXHIBITION, which opens in San Francisco, Tuesday, August 5th, 1879.

It will be of large size, printed and circulated FREE in the Pavilion, and contain the day and evening programme, a list of exhibits, and official bulletin of the Institute.

Its columns will embrace a large variety of important industrial and scientific information, illustrations and well written descriptions of the general features and most deserving and novel exhibits in the Fair, a record of the Fair and incidents of its daily progress—gay, serious and comic—as they occur.

The best of editorial, reportorial and corresponding talent will be employed, with a view to make the paper of live interest in all its departments and of standard value as a full record of the great exhibition, the wonderful inventions, rich resources and rapid progress of our great Western community.

More than ONE HUNDRED THOUSAND different individuals will read copies of our paper during the Fair. The novel character of the journal—the specially attractive features of its free issue in the Pavilion, and its absorbing interest to visitors at the Fair, the attention its columns command when brought into the shop and family circle by those who receive it freely at the Fair, make the paper a powerful advertising medium.

The Managers have granted us the exclusive advertising and printing privileges, and will receive no advertising in the official catalogue and reports.

Our nine previous volumes have met with unrivaled success and gratifying results to advertisers, nearly all of whom were leading and first-class business firms.

Many thousands of marked copies were sent by mail and otherwise to friends near and distant, giving the FAIR DAILY a more broadcast and universal circulation than any other newspaper published.

Its columns are more closely examined throughout than those of any ordinary publication.

By past experience, ample facilities, and a fair reputation of doing business in our line, we expect, with the reasonable support of all naturally interested in the success of our enterprise, to make the coming volume superior to its predecessors, and eminently satisfactory to the Institute, to our patrons and to the general public, who are more or less benefited by such an advocate of the substantial advancement of the grand and worthy industries of our Coast.

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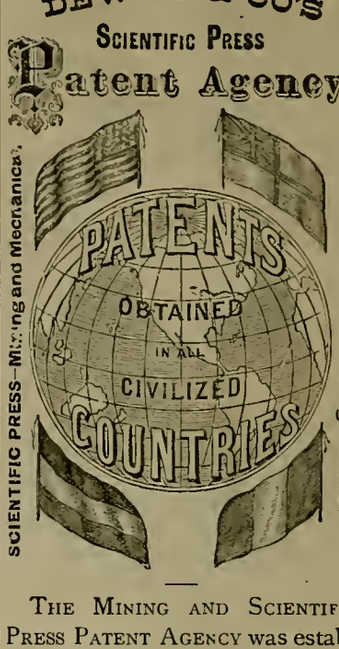

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* * * * You will now receive my grateful, heartfelt thanks for the able manner in which you have conducted the interest intrusted to you by me. Your acknowledged ability, confirmed to me as it is by the successful presentation of my claim for a patent on a pump power, not only delights me, but suggests the propriety of my continued patronage and that of all my friends. With kind wishes for your future success, I subscribe myself, yours respectfully, A. L. HUNSAKER.

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Batteries for Dry or Wet Crushing, Amalgamating Pans, Settlers, Furnaces, Retorts, Concentrators, Ore Feeders, Rock Breakers, Furnaces for Reducing Ores Water Jackets, Etc.

Sugar Machinery.

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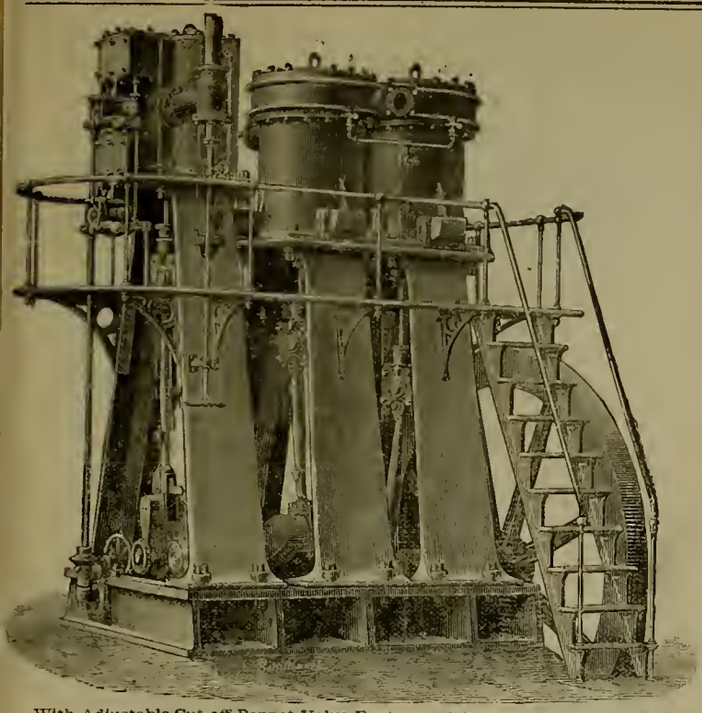

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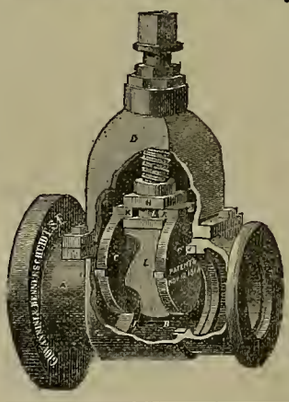

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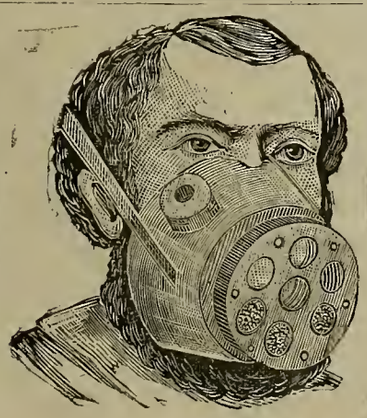

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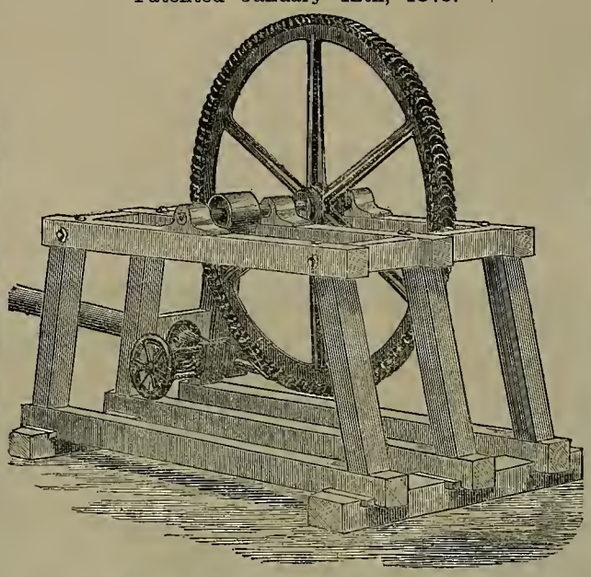

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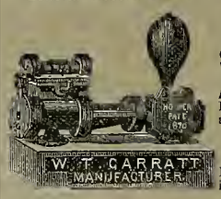

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GEO. LETTE, Secretary.

San Francisco, June 30th, 1879.

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An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, JULY 19, 1879.

VOLUME XXXIX Number 3

Molera & Cebrian's System of Electric Lighting.

The electric light in itself is admitted to be superior to all the artificial lights known, and in many instances has been also the cheapest.

According to the testimony given by some of the most eminent scientists before the British Parliamentary Commission, appointed to investigate the merits of the electric light, it is called to supplant, in many cases, all other illuminants.

We have already given an account in one of our previous issues of the system of electrical illumination, by Molera & Cebrian, civil engineers in this city, and to-day we propose to explain in detail its application to the lighting of mines, for which it is specially adapted.

Its Application to the Lighting of Mines.

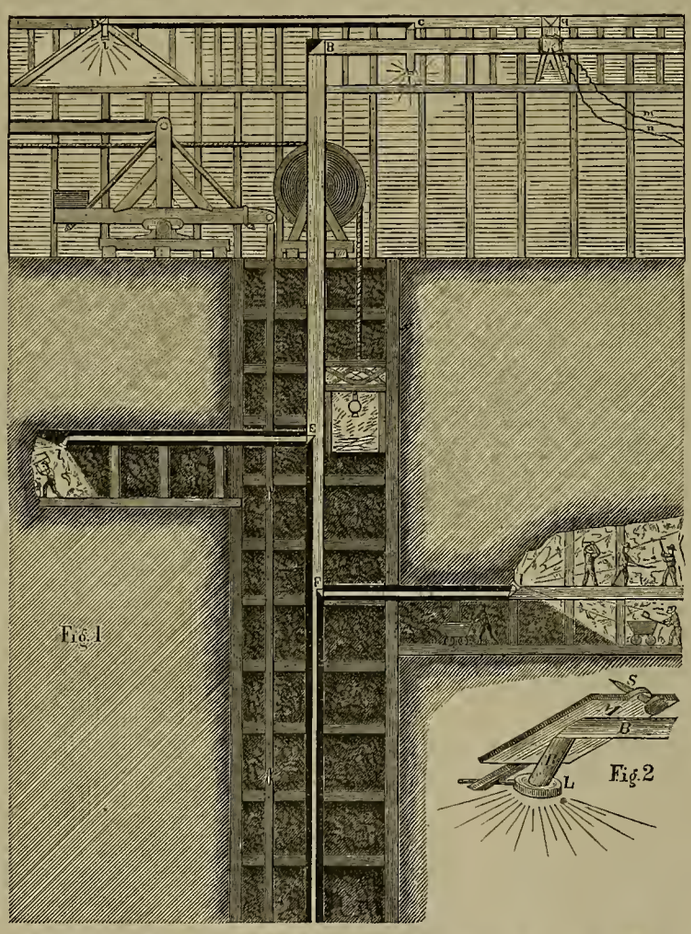
Two of the most prominent advantages of the electric light besides its superior kind of illuminating power, are the avoidance of explosions and fires, and the little influence it has upon the surrounding atmosphere, on account of the small quantity of heat it emits and of its not being fed by combustion.

These two advantages are of paramount importance in all kinds of mining works, where explosions are always fatal, and the heat and foul air of the mines themselves are so great.

In consequence, trials have been made in some collieries in England, and with satisfactory results; and we may expect at no distant future that the electric light will make the miner's work safer and more endurable, and consequently more profitable.

The general way of using the electric light seems not to be especially useful for mining work. The lamps are of too delicate a mechanism to be handled by miners generally; they must be enclosed in glass globes to prevent the electric arc being brought in contact with the gases in the air. But the system proposed lately by Molera & Cebrian is particularly adapted for these conditions as well as for others. Because in this system, neither the electric lamp nor the conductors need be in the places where the light is used. All the appliances to produce the electric arc may be kept in a small room above ground, and the light alone is transported to all places underground, and is applied to any particular point where most needed, and are particularly illustrated in Fig. 1, which represents the shaft and part of the working of a mine. *A* is the lamp and chamber of light, emitting several main beams of light, *A q*, *A B*, etc.; *m*, *n*, are the two wires connected to the generator of electricity. Fig. 3 shows on a large scale the chamber *A*. The electrodes form at *G*, the electric arc; *L*, *L*, *L*, are condensing lenses, which shape the light in beams of parallel rays; *H*, is a circular reflector to throw the downward light to the upper lens. This chamber, represented as a cube, may be of any other shape, and will emit as many such beams of light as faces, less one, it has, thus affording the way to convey light to different places far away; because, as it is well known, when light is condensed in parallel rays it can reach to long distances with a very small loss due to the absorption of the atmosphere. The vertical beam, *A q*, is intersected by a double reflector, *q*, that may be a totally refracting prism, and it will change the beam, *A q*, in two horizontal beams, one of which, *q D*, is intersected at *c* and *D* by prisms or reflectors that divide it in two downward beams, *c l* and *D l*, to light the upper buildings of the shaft. These beams of light *may* be inclosed in tubes or pipes, to avoid their being intersected by dust or other foreign bodies; these pipes may be of any material, as they are not subjected to any special stress. These downward beams would strike the floor only, but they are intersected by lenses or reflectors, *l l*, which, according to their curvature and position, will disperse their light any desired way.

As instances thereof, we show in Figs. 4 and 5 two cases. In Fig. 4, *C C*, represents the ceiling, *L l*, are two lenses, and, *r r*, a spherical reflector; the larger portion of the parallel beam of light passing through *l L* is spread in a divergiug cone, and the other portion striking upon *r r* is distributed upon the ceiling and walls, as it may be required. Fig. 5 shows two lenses, *l L*, and a glass, *PP*, the inner cone of which serves as a reflector, and its outer side does the service of another diffusing lens, as represented; the sections of *P* and of the lenses are designed optically, so as not to waste the parallel beam of light, and distribute it according to the needs of the case. There will be two, three, or more different lenses near each outlet of light, each of which will give a cone of light of different width, by this means the light may be concentrated upon a writing desk or a large table, or it may be spread all over the floor, or still higher up the walls to the ceiling, as it may be needed. These lenses may be kept in a row, and made to slide, by means of rollers, and cords or wires, which will be pulled more or less from the rooms, and the light regulates as easily as a gas key.



MOLERA & CEBRIAN ELECTRIC LIGHTING APPLIED TO MINES.

Turning again to Fig. 1 the horizontal main beam of light, *A B*, coming from the chamber of light, *A*, is intersected by the prism or reflector, *B*, which bends it totally into the shaft. At every gallery, winze, etc., proper reflectors are placed, such as *E F*, which, according to their size, will deflect portions of the vertical beam into their respective galleries. By a judicious use of reflectors or prisms the other main beams of the chamber, *A*, may be deflected and sent through the same shaft or to other shafts more or less distant. Also every one of the secondary beams, *E l*, *F l*, etc., may be deflected several times, upwardly, downwardly or laterally, so as to transport the light to any desired place in the workings. When these beams of parallel rays reach their final destination they are intersected by the dispersing lenses, *l*, *l*, to diffuse the light conveniently as represented.

In the underground workings the lenses may be used in connection with the adjustable reflector, *M*, of Fig. 2. It is a mirror or reflector attached to the spike, *S*, which is to secure it against the timbers or the earth. *L* is a lens that can be adjusted by means of a slide and screws, so as to receive the beams of parallel rays, *B B*, after it strikes the mirror, *M*. By the proper motion of mirror, *M*, and lens, *L*, the beams of light can be applied wherever needed; the lens, *L*, may be placed on top of *M* at the bottom or sides, according to the requirements of each case.

It will be seen that the reflector or prism, *B* controls the light of the whole underground works, and that the prisms, *E F*, equally control the light of their respective galleries. If the reflector, *F*, is brought lower down it will leave its gallery in the dark, and will light a lower gallery or winze. Or if the prism, *E*, is removed, and prism, *F*, is made to slide so as to intersect the whole beam of light, *B F*, all the light before used in the upper gallery, will now be added to that employed in the second gallery.

Thus, the motions of the prisms and dispersing lenses accomplish the transportation of the light to and away from any point in the mine, and in amounts varying at will, as different cases may require.

It will be readily seen from Fig. 1, that if all the prisms or reflecting lenses, and the tubes carrying the beams of light were placed along the floor joints and walls of a building that this system would also accomplish the lighting of several floors, and several rooms from a single source of light, *A*, and in a perfectly controllable manner.

Therefore, this new system may be adopted to all kinds of uses. The losses inherent to this system are due to the loss of light when it is reflected or refracted, and also to the absorption of the atmosphere. All these have been calculated, and in no case do they reach 50% of the light at the lamp, *A*, (Fig. 1). All other systems of subdividing the electric light in small lights show losses of not less than 85% or 90%; therefore this new system must be cheaper than any other electric system. Besides, the other systems have a limit to the subdivision of the light, as their losses increase with the number of lights. But as the losses of this new system are independent of the number of small lights, the scope of its application must be very extended. This also allows for the new system, using a very powerful focus of light which has been found to be the cheapest.

As to economical advantages, it will be noticed that regulators or lamps are entirely dispensed with, and that attendance is consequently not required; a very great saving, both in prime cost and in running expenses.

Another important feature is, that the great expense and loss consequent upon the use of electrical conductors is entirely avoided, as the single lamp needed is located near the generator, permitting of the use of a short and thick conductor having practically no electrical resistance.

The light produced being small, the wasteful use of opalescent globes is suppressed.

A great advantage in having only a single lamp for a large system is, that a vacuum may be maintained in the chamber of light without difficulty, thereby preventing the rapid combustion of the carbon, which always occurs when the electric arc is maintained in air. The cost of the carbons, as well as the labor of replacing them, which, in the ordinary electric regulators, is something considerable, is entirely avoided.

Another great advantage of having only a *single lamp*, is the facility to use the quinine sulphate, the uranium glass, and the other substances that have the property of changing the blue, violet, and ultra-violet rays into white light, thus rendering visible and useful radiations which the eye could not perceive, and adding considerably to the brilliancy or intensity of the light.

As the electric lamp is kept away from the places that are lighted, this system well completely avoid the humming noise of the electric light, and the effect of producing nitrogenous vapors.

Besides the many different applications of this system, we wish to call attention to its adaptability to mining works of any description, to chemical factories, to powder works and magazines, and warehouses and other similar purposes, where the danger of ignition or producing explosions are so very great.

The invaluable feature that the steam engine and boiler, the dynamo-electric machine, the electric lamp and electric conductors may all be kept far away from the buildings, makes of this new system the only one that may be used in dangerous localities as cited above. In some of them light is altogether prohibited, and in others when it is used it raises the rates of fire insurance considerably. This last remark may be applied as well to the case of private and public buildings.

In the case of colleges, asylums, barracks and penitentiaries, where it is desirable that a single officer may have the control of the light, and where the great number of inmates makes the dangers from fire more liable to occur, this system also appears to be the only one that can be used with all safety.

Fig. 3 also represents a section of a new lamp on the float principle. The carbon rods are supported by pistons or floats in inclined tubes, *J*, which are connected at their lower ends by a horizontal tube communicating with the spring-acted bellows or cylinder, *K*. The tension of the spring that draws the top of the bellows down, may be changed by revolving the small windlass, *S*.

The top of the bellows is iron, and above it is supported an electro-magnet, which is in the electrical circuit. The carbons pass between conducting surfaces, and are also in the electri-

Continued on page 41.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds

Lumber, Mining and Tourists in Fresno County.

Editors Press:—Though crops in Fresno county are generally light, except on the few lands well wet by irrigation or mountain rains, other interests are giving considerable life to Madera, Berenda and Borden. Madera is not only the railroad terminus of the great lumber flume 52 miles long, which winds along Fresno river, and has brought millions of feet of timber from the sawmill seven miles northeast of Fresno Flats, but is the point of departure for Washburn's stages, which carry a large part of the Yosemite tourists, to visit that beautiful valley, some 400 having passed over this popular route from May 4th to July 4th. Again, large amounts of supplies are shipped from below to Madera and Borden for the

Lake Mining District, of Mono County

And intermediate mines of more or less recent development, around Fresno Flats as a center; also for the new mining districts along the upper San Joaquin, in the eastern edges of Fresno county, on the western slope of the highest ridges of the Sierras, and only from 10 to 15 miles east and northeast of Mammoth City. These supplies are hauled by freight teams to Fresno Flats and to still higher points, and are thence carried to their various destinations by pack trains, Mammoth City, the extreme point, being from 50 to 65 miles from Fresno Flats, according to various rough trails. To enable passengers to reach the Lake district and Bodie, by a quick route, a coach is run from Berenda twice a week (Tuesdays and Fridays) and these connect with

French's Saddle Train at Fresno Flats,

The horseback ride being made to Mammoth City in a day and a half. By this route it is possible by hard riding, to make the trip from Mammoth City to San Francisco in 32 hours. The usual time from San Francisco to Mammoth City this way, is 22 hours to Fresno Flats, and 26 thence to Mammoth, or 48 hours, spend one night on cars and in Berenda, a second night at Beasore Meadows, some 20 miles east of Fresno Flats and 38 miles west of Mammoth. Fare by this route is $14 to Berenda from San Francisco and return, and $10 by stage to Fresno Flats and return, thence $25 to Mammoth City and return, or about $25 for the trip each way. The saddle train usually passes the only sawmill that is supplying lumber from

The Great Timber Belt

On the south side of the San Joaquin in Fresno county. This mill was erected in '73 and '74 at a cost, with the necessary roads, of about $50,000. Sawing and the building of their flume commenced in June, '74, and the flume was completed in August, '76, requiring about 7,000,000 feet of lumber, costing between $225,000 and $250,000, according to the Secretary's books. It is the longest flume in the world, making a descent to Madera of over 4,400 feet, about one-third of this being made in the first five miles from the mill. The original company was known as the California Lumber Company. But the property changed hands last August, the present company, which is vigorously pushing the work ahead, being known as

The Madera Flume and Trading Co.

Juan Malarin is President, E. McLaughlin, Manager; remaining stockholders, C. T. Ryland and Return Roberts, all of San Jose. Wm. H. Thurman and James Dickinson, stockholders in the original company, now have a contract to cut, saw and pile the lumber at the mill. This mill runs by steam two five-feet circular saws and one gang edger, easily averaging 40,000 feet per day. They have turned out in the last five years, over 20,000,000 feet of lumber, and will saw from 5,000,000 to 6,000,000 feet in the next five months. From November to May they are obliged to stop operations on account of the heavy rains and snow, the latter falling sometimes to a depth of 10 feet there and on their timber claim, at altitudes varying from 4,800 to 6,000 feet.

The great timber belt of the Sierras is about 10 miles wide here, extending in all

Over 400 Miles,

From Kern river on the south into Oregon on the north, its general width varying from five to ten miles; altitude, from 4,000 to 6,000 feet. The sugar pines and firs here reach diameters from six to nine feet, and produce excellent lumber when carefully selected. The fencing and scantling made from the best firs is establishing a reputation equal to Oregon pine, Henry Miller having used 400,000 feet of fencing sawn from firs. He strongly endorses it as equal to Oregon pine, as Mr. Thurman informs me. Redwood posts are also shipped in large quantities by the flume. They are cut from the smaller members of the big-tree family *(Sequoia gigantea)*. They are quite as lasting as those from the small redwood *(Sequoia sempervirens)*. In the North and South grove of big trees, extending from two to three and one-half miles north of the Company's mill, are about 500 of these trees, varying in diameter from 4 to 30 feet, to say nothing of numerous small ones.

The Three Sisters

Are large, handsome trees in a straight line, the outer ones not being more than 100 feet apart. The girth of the largest is nearly 100 feet. Their hight varies from 250 to 350 feet. Fresno Flats is becoming an important station as the center of the gold mines of this county and a stopping point for teams, stages, pack trains and saddle trains. Its hight above the sea is 3,150 feet, its climate is healthy and a fine type of the best mountain climate of California. It is surrounded by a number of very fine mountain ranches, where plenty of hay, potatoes, vegetables and fruit are produced. Some of them are provided with water for irrigation, which is very valuable in a season like this. This is especially true of the fine ranch of Wm. H. Crooks, settled by him in 1853, about six miles down the Fresno river from this point. His ditch and flume cost him about $1,200, and his ditch now supplies water for the arastras of the valuable Enterprise mine, a mile from him. A future letter will give your readers some facts about mining interests of Fresno county.

J. W. A. W.

Fresno Flats, July 4th.

Virginia City.

Editors Press:—This mountain city, this city of great wealth, of vast enterprises, of unresting activity; this city of the precious metals, of gold and silver inexhaustible, where the rattle of dumping rocks, the roar of cars, the whistle of the locomotive and the puffing of steam from crushing mills and vast hoisting works are ever heard; where men rest neither day or night, but the Sabbath is the same as Saturday; where toil, toil, toil, is the order of existence, and all the means of living are dependent upon those descending and ascending a half-mile perpendicular shaft daily into the solid earth; what pen can truthfully trace its features, and give to strangers, in the land of steady habits, a correct impression of its peculiarities?

The summit of Mt. Davidson, a prominent peak of an extended range, hangs loftily over the city on the west, while into its steep side the hand of man has dug terraced blocks and streets, so that as we entered on the ground floor of our lodging house, the Pacific, and passed to our cosy room in the back corner and looked out down from our window, lo! we were in the third story of the next street. Thus the buildings of the city rise one above the other on the steep mountain side like men on seats in a theater, but with an arena of the world a vast prospect to the east, where appear hills, peaks, ranges, gorges, valleys and plains, all treeless, grassless, worthless, as dried and dead as nature could well make them.

Yet there is gold here, and silver, which generations cannot exhaust for ages. The great Comstock vein extends in a clearly defined ledge full five miles in length, and may develop in miles beyond both ways. Side veins and branches are numerous, of varying richness, while the improving methods of working the rock are making more and more valuable all ledges bearing the precious metals, till those now really worthless may come to yield fine returns to those engaged in mining them.

We were more than ever before interested in discovering these possible developments outside of the real Comstock lead. We had the pleasure of an excursion visit with Mr. D. H. Jackson, large owner in and Superintendent of the North Bonanza and Flowery claim, nearly four miles north and east of Virginia. The claim is not in the direction of the Comstock lead, though surely this may bend and here appear in its genuine features. We went down its admirable incline over 500 feet, following the dip of the clearly defined vein, and out along its different levels, and everywhere the indications were excellent. We also went along on the outcropping ledge upon the surface, and saw the different prospecting openings, and everywhere the vein was clearly marked with walls smooth and distinct on each side as if made by the hands of men. The width of this vein is fully 120 feet, while exact measurement might make it much more. All this width of rock is metal bearing, while proper, not extra, selections have yielded from $60 to over $100 per ton. It is not known how far this body extends in length, yet for miles it is claimed waiting for the full developments of the Bonanza shaft.

Other veins like this elsewhere exist. One on the west of the city, higher up the mountain, seems to cross the Comstock to the north and is over 130 feet thick. We went into the tunnel prospecting this vein, over 1,000 feet, with its owner, Mr. Lyon, and though the vein is greatly broken and mixed, yet it may prove of much value in time. It is possible that the richness of the Sierra Nevada and Union claims is largely owing to their being located where this lead and the Comstock intersect.

The Comstock vein through Virginia and Gold Hill and as far as it has been worked, dips at an angle to the east, so that in sinking upon it over 2,000 feet, the works have been carried far to the east. Thus most of the companies have gone a quarter or a half mile eastward, and sunk new shafts either singly or in combinations to facilitate operations.

At the great depths of the shafts, some now over a half mile in perpendicular depth, the large amount of water encountered has compelled some once very paying companies to suspend work and expend all the energies of their machinery in pumping, waiting for better facilities for removing the water. This has been the case with the Savage, which, for over two years, has been only pumping its water to keep it from destroying the mine. The desired better facilities have finally appeared, and the Sutro tunnel, at length overcoming every difficulty, became fully available for use on the first day of July. So advantageous in this way, as also in others, is this tunnel proving, that in one day of operating through this tunnel the Savage was able to lower the water in its works 100 feet. This improvement may enable Virginia to regain its former activity, and again all its mines be shipping ore and declaring dividends.

There is only one really bad thing in the condition of affairs in this, as also in other, mining regions on the coast. Man, as a rational being, needs one day in seven as a time of rest from regular business toil. He needs it as really as he needs bread. Without such a day of rest, and of moral improvement, he may retain much of traditionary or once customary, moral and intellectual character; yet gradually this surely wears away, and man sinks more and more downward in the scale of existence till he becomes a mere human automaton in labor, toiling for food and bodily comfort, like the treadhorse or mule in a mill. But he does not stop in his descent at this, for, as a being with a progressive character, he yet descends to lower depths, in debasing talk, associations and practice, a poor, abject, sensual being. It must be so without a day of rest, one in seven, a Sabbath for higher thought; nobler aspirations; purer, richer, happier attainments; becoming an intelligent, moral, immortal being. The provisions of Christianity are exactly united to man's wants and greatest possible good both now and forever.

S. V. B.

Mono County Mining Interests.—No. 2.

Editors Press:—I have just returned from an exploration and complete examination of the greatest, most extensively worked and oldest mine in the Bodie diggings, viz., the Standard. Being the oldest, a scrap of its history may not come amiss. Before Bodie had even started on its prosperous career, two Germans discovered the croppings of a small ledge where the Standard claim now is; this they worked with profit by means of an arastra; the ore on which they worked, however, was one of the thinnest of ledges, and although to them there was great profit, still the ore did not so much as form an approach to the quality now encountered, their insignificant ledge being soon abandoned by the present company. The first owners continued their work slowly downward until they came across a horse. With this obstruction they abandoned the downward work and commenced a drift; another horse was soon encountered and at this they began a drift on the opposite side of their shaft. Once again they ran across the inevitable obstruction, the horse, and, not even attempting to remove it, they gave up hope for further development. Discouraged at their poor success, they sold all to Seth and Daniel Cook and John F. Boyd of San Francisco. These with some others forming the company of present owners, $67,500 was the amount paid by them for the property, and this was all realized at the end of the first month after it came into their possession. Since then all know the extent of their dividends, it being strictly a dividend-paying mine.

Under their management the name has been changed from Bunker Hill Bullion to Standard, the old ledge was allowed to rest and work began on the Standard ledge. A large force of competent men was employed. The Standard mill of 20 stamps was built and put in operation, and affairs assumed the aspect of continued and steady progress, exciting a lively interest in the camp which has increased to the present day.

Eight hours were spent by me in examining the works of the old and new Standard, and its extent totally prohibits the possibility of a complete description, but a rough sketch will be attempted, beginning with the old Standard.

The shaft or incline, properly termed, is run on the main or Standard ledge, which has an average dip to the 808 level of 45°, though approaching more a horizontal direction at the bottom, and becoming here nearly flat. Its thickness varies from one to fifteen feet in the thickest part, and is interrupted all the way down by numerous horses of syenite and porphyry. The first level we reach is 300 feet from the surface, and the strike of the ledge being north and south and the dip west, is drifted 450 feet north, 300 feet of which is stoped up 50 feet, and 450 feet south which is stoped upward 200 feet. On this level are several crosscuts and smaller drifts all yielding a rich ore, and the ledge varies considerable in width but little in quality. One hundred and fifty feet lower on the same incline, following the Standard ledge, we strike the 450 level; this we find drifted north 80 feet, and south clear to the Bodie line, 900 feet, the north drift being stoped up to the 300 level, and the south drift stoped up 100 feet. Another 100 feet lower and we strike the 550 level, the lowest level worked at present, all below this remaining to be worked, by the new Standard shaft, which is located to strike this almost horizontal extension of the ledge and of parallel ledges at a reasonable depth. The level is drifted 500 feet south, 80 feet of which is stoped up 80 feet, and 60 feet north of which none is stoped. The mass of ore above the long drifts of this level remains *in situ*. On all these levels are crosscuts running west and intersecting the ledges encountered, which run parallel to the Standard ledge. These ledges are the Bruce and the Burgess, each drifted and stoped out a little, but containing yet a "mountain" of rich ore, found and tested and waiting in nature's storehouse.

Proceeding to the new shaft we find arrangements for deep and exhaustive work. A three-compartment vertical shaft runs down 780 feet in all, water preventing further sinking for the present. Prospecting work has been carried on since the beginning. We find a 400 level where drifts and crosscuts expose three heavy veins to be stoped to the surface. Of these, one is the famous ledge of which we hear so much, whose thickness is in some places as much as 23 feet, a huge body of valuable ore. This I ascertained to be a fact, examining it closely and detecting large amounts of gold with the naked eye. Here then the ore has been found and fenced in, so to speak, with crosscuts and drifts—the game is cornered and the company has now but to play with it to their heart's content. It is not necessary for them to look farther, as there is now all they can manage within easy reach; years and years of stamping and paying dividends will not exhaust their unlimited treasures. There is no speculation with this mine; nothing of the wildcat nature attached. The company is a responsible one, the Superintendent understands his business thoroughly, and where can we find a better millman than Dawley. Commendable, indeed, is the work performed by the following connected with this mine: Mr. Irwin, Superintendent; Mr. Hickey, foreman; Mr. Scowden, mine surveyor, and Messrs. Gleason and McMillan who superintend the timbering and intimate manipulation of the work below ground.

A run through the Noonday mines reveals the following: The shafts, two in number, are south of the town on Silver hill; one of them represents Noonday proper and the other North Noonday. The former being the most developed, we will proceed to examine it first.

On the surface is found but the floating rock of a broken ledge. Descending a perpendicular shaft 50 feet we strike an incline the angle of which is 60°, and from this on the shaft follows the ledge of quartz, which varies between two and three and a half feet thick. Over this incline the bucket in which we ride slides clumsily along. After a total depth of 200 feet, we strike the bottom of the first drift. The total length of the drift, including both directions from the shaft, is now 280 feet; running north and south. This drift is covered by the remains of overhand stoping to the extent of 40 feet up the ledge, and on the top of this debris is exposed a very good vein of quartz which assays about $250, mostly silver. This stoping and filling in will be continued to the surface of the ground, running the ore down shoots which pass through the debris and discharge out the drift. From the 200 drift on each side are run crosscuts, the one to the east intersecting a poorly delineated vein, a few feet in, and the one to the west encountering a vein of good dimensions and fair condition, which is to be worked in the future.

From the drift, again, not in a continuation of the incline, there is a winze following the main ledge down 120 feet and occupied by an ordinary windlass manipulated by two men. Into the bucket we crawl again and down we slide. At the bottom we find our ledge made up of ribbon veins with a fair outlook and reasonable assays. The drift for this level is just begun, and the quartz between the drifts will be stoped out as above. By means of our bucket and a whim and two horses on top, we come again to the surface.

One hundred yards north of this shaft is the North Noonday shaft, down only 120 feet on a narrow ledge, but above, on which is now being erected machinery for sinking 2,000 feet, the most extensive in the camp. There are three good compartments to the shaft, and pressure drills are soon to be introduced which will bring about a speedy connection with the Noonday proper. R. D. Breven is superintending the mines in the absence of Superintendent Fox. This company will soon put up a 30-stamp mill, and will then do a lively business. At present the Miners' five-stamp mill is crushing for them and disposes of but five tons of ore per day, $12,000 being taken out of the Noonday last month.

The Booker mine has nearly finished a pump of enormous dimensions, which will raise water 1,500 feet. At present no ore is being taken out on this account. Considerable pride is taken in this, the first pump, in working order in the camp.

J. H. W.

Bodie, July 7th, 1879.

Origin of Kerosene.—A Russian paper says that the farmers in the District of Kahilianki (Poltava) have given up the use of kerosene lamps because this sort of oil (petroleum) comes from the decomposed part of Satan, who has been confined to rot beneath the mounts of Caucasus since he rebelled against the heavenly powers. The Boston *Journal of Chemistry* cites this to show the Russian superstitious sentiments, but no longer than one month ago an individual in Pennsylvania circulated a petition to the Legislature of that State to prohibit the sinking of any more oil wells, because the oil was needed to lubricate the axle of the earth, which was already beginning to grind through loss of oil. He obtained many signatures so it is said. An imagination sharpened by a constant diet of baked beans cannot be expected to find any superstition except in some foreign country.

MECHANICAL PROGRESS.

A Powerful Spectroscope.

In the young science of spectroscopy, as in others, an important element of progress is the improvement of instruments for dealing with the phenomena presented, and many minds are engaged on this. A new spectroscope of remarkable power has just been brought to the notice of the French Academy by M. Thollon. Its chief feature is the use of sulphide of carbon prisms, which are closed laterally, not by plates with parallel faces, but by prisms of the form of Amici's—*i. e.*, having curved sides meeting at an angle, which, however, is much smaller than Amici's prism. The refringent angles of these prisms are in an opposite direction to that of the sulphide prism. Two of these compound prisms are substituted by M. Thollon for the simple prisms in a spectroscope, which he formerly described to the academy. Without going into further details, we may simply state that an enormous dispersion is obtained; with a magnifying power of 15 to 20 times, the spectrum has a length of 15 meters. The angular distance of the D lines of sodium is about 12′, whereas that produced by M. Gassiot was only 3′ 6″. This instrument should throw considerable light on the structure of the spectrum, and M. Thollon has already noticed some interesting facts. The lines of sodium and magnesium present a dark nucleus passing into a nebulosity, which becomes gradually merged in the continuous spectrum. Many lines have been split up, and all that have been thus resolved have been found to belong to two different substances. One of the hydrogen lines presents a nebulosity without a nucleus. M. Thollon remarks on the magnificence of the spectrum of carbon from the electric arc, observed with the new instrument. The spectra of iron, copper, and magnesium in the same arc were also seen with admirable clearness and brilliancy. These new spectroscopes have been constructed for M. Thollon by the able optician, M. Laurent.

The Sphygmophone.—The sphygmophone is a recent application of the telephone, and is an instrument invented by Dr. Richardson, by which the movements of the arterial pulse are transmitted into loud telephonic sounds. In this apparatus the needle of a Pound's sphygmograph is made to traverse a metal or carbon plate which is connected with the zinc pole of a Leclanche cell. To the metal stem of the sphygmograph is then attached one terminal of the telephone, the other terminal of the telephone being connected with the opposite pole of the battery. When the whole is ready, the sphygmograph is brought into use as if a tracing were about to be taken, and when the pulsation of the needle from the pulse-strokes is secured, the needle, which previously was held back, is thrown over so as to make its point just touch the metal or carbon plate, and to traverse the plate to and fro with each pulsation. In so moving, three sounds—one long and two short—are given from the telephone, which sounds correspond with the first, second and third events of sphygmographic reading. In fact, the pulse talks telephonically, and so loudly that when two cells are used the sounds can be heard by an audience of several hundred people. By extending the telephone wires, the sounds can also be conveyed long distances, so that a physician in his consulting-room might listen to the heart or pulse of a patient lying in bed (speaking modestly as to distance) a mile or two away.

An Effective Plan of Fire Signals.—The admirable arrangement in this city for sending fire-alarms to the engine-houses and fire head-quarters is nowhere seen to better advantage than in the Broadway store of Lord & Taylor, which was the first large establishment connected with the fire-alarm telegraph. At two points on each floor are placed electrical "buttons" inclosed in small wooden cases with glass fronts. If a fire occurs the duty of the watchman is to break the glass and push the "button," when an automatic machine on the fourth floor is immediately set in motion. This machine, being connected with the fire-department wires, communicates Lord & Taylor's special signal to headquarters. In a few seconds the alarm has been repeated at the nearest engine-house, and a steam engine is on its way to the fire. Should the first alarm miscarry, the gong-alarm, which is always sent to the engine-houses 15 seconds after the first signal, serves to designate the locality of the fire.—*New York Tribune.*

A Swiss Exhibition.—Switzerland has appointed the year 1881 for an international exhibition of watches, jewelry, snuff boxes and musical boxes—a display in which the ancient republic may well call the rest of the world to see what she can do. This project adds another illustration to the recent tendency of international exhibitions, especially in smaller countries, to run to specialties. This will be the first exhibition of the sort in Switzerland.

The *Scientific American* wants some "wide-awake California boy" to invent a trap to catch that troublesome squirrel, the gopher. This is a personal affront. For every gopher in California there is a trap of some kind, the only difficulty is to persuade the gopher to go into it. Besides the gopher is not a squirrel. Has the *Scientific* tried salt on their tails?

Economical Steam Engine.—The Corliss engine at the French exhibition of 1878 consumed only one kilogramme (2.2 lb.) of coal per horse power per hour. A similar engine of 700 horse-power, constructed by M. Farcot, for the drainage at Asnieres, consumes only six-tenths as much. M. Tresca, in recommending, on behalf of the committee of the French Academy, that the Montyon prize should be awarded to the inventor of this engine, stated three special advantages which it possessed. A form of construction which establishes a great firmness between the cylinder and the chief arbor, with the least consumption of material; the separation of the orifices of admission and emission, to the great advantage of the permanence of temperature in the steam at its entrance into the cylinder; and a system of distribution commanded by a central platform for the four openings by means of springs and came, which secure the opening and closing of the orifices. While claiming for Cave the principle of separation between the orifices and conduits of admission and escape, the committee consider that Corliss' applications of the principle, the precision of action, and the economy of its engines entitled him to the Montyon prize of 1,000 francs, and the Academy awarded the prize accordingly.

Instrument of Resuscitation.—A Frenchman has the credit of inventing an apparatus for aiding in the resuscitation of persons apparently drowned, or who from any other cause have been temporarily deprived of animation. It consists of a cylinder of sheet iron large enough to contain the body of an adult person. It is closed at one end, and the inanimate individual is inserted, feet foremost, in the receptacle as far as the neck, round which there is placed a padded diaphragm, fastened to the cylinder so as to be air-tight. An air pump, attached to an opening in the tube, creates a partial vacuum, and the outer atmosphere, by its own pressure, forces its way into the lungs by the mouth and nostrils, which are left exposed. By a reversed action of the pump the air is allowed to re-enter the cylinder, and respiration is thereby re-established. A glass plate inserted in the iron casing enables the operator to watch the movements of the chest, which rises and falls as in life with the working of the pump. The action may be repeated, it is stated, 18 times in a minute, an exact imitation of natural breathing being thus produced.

Lighting the Capitol by Electricity.—The arrangements for lighting the capitol building at Washington with a new electric light are nearly completed. The experiment has already been made in the Hall of the House of Representatives, and a single light placed on the front row of the reporters' gallery and over the Speaker's chair made the whole hall so light that print could be easily read at the points furthest from the burner. The plan is to place four lights in the hall, and it is now believed that they will be a very great improvement upon the present arrangement of gas burners. Three electric machines have been purchased under the appropriations for lighting the interior of the building, and it is in contemplation to place another in position for the purpose of supplying a light of vast power upon the top of the dome. It is claimed by the inventors that a burner can be constructed there which shall have a very appreciable effect upon a large area of the city. It is claimed that with the steam power of the heating and ventilating apparatus in each wing of the building, a dynamo-electric machine of 175,000 candle power can be run.

The New Transatlantic Cable.—The cable steamer, *Faraday*, left Millwall at an early hour on Monday, and during the forenoon was safely moored abreast of Messrs. Siemens' works at Charlton. The *Faraday* is a powerful steamer of 4,900 tons, built at Newcastle in 1874 for Messrs. Siemens, and designed specially for laying cables. In the course of the afternoon she was surrounded by barges; those on the outside supplying her bunkers with coal, and those next to shore being employed in passing the cable into the steamer's tanks. The new company, the official style of which is, "La Compagnie Francaise du Telegraphe de Paris a New York," has opened offices in London for the transaction of executive business at 100 and 101, Gresham house, Old Broad street. The *Faraday*, having on board the shore end and the Brest-Scilly section of the new cable, was cleared at the London Custom-house on Tuesday night for New York, and sailed for Brest the following morning. Her departure had been delayed, the wet weather having interfered with the work of coiling the cable in the bunkers.—*London Iron, June 21st, 1879.*

The South African Cable.—The telegraphic cable to connect the European and Asiatic telegraphic systems with the Cape of Good Hope will be 4,000 miles long, extending from the Red Sea cable, of Aden around Cape Guardafui and along the east coast of Africa to Port Natal, where it made a junction with the present land line to Cape Town. The cable will be laid along the coast, the depth being moderate along that side of the continent and the facility for repairing possible breakages has been carefully ascertained. The cable will touch at Zanzibar, Mozambique, Sofala, Delagoa Bay, and thence to Durban as the submarine terminus, from which point the land telegraph becomes available to complete the circuit to Cape Town. The cost of construction and laying the cable is estimated at $7,500,000. The line from Durban to Zanzibar is to be finished in July, and the whole cable by the middle of November.

SCIENTIFIC PROGRESS.

A New Theory of the Earth's Magnetic Poles.

From a study of the movement of the compass-needle producing declination at London, Mr. B. G. Jenkins, of the Royal Astronomical Society, has become convinced that the various vicissitudes of the needle during the last 300 years can best be explained by the supposition of a strong magnetic pole above the earth's surface, and revolving around the geographic north pole in about 500 years. He finds four magnetic poles, as maintained by Halley and Hansteen, to be necessary to explain satisfactorily all the phenomena of terrestrial magnetism, but he places these not in the earth, but in the atmosphere. These poles he regards as the free ends of as many broad magnetic belts, two extending from the vicinity of the north pole to the equator, the other two coming up from the south pole to meet them, the boreal magnetism of the northern belts uniting with the austral magnetism of the southern belts along the magnetic equator. These bands he believes to revolve at slow and unequal rates round the poles of the earth, producing secular variations.

It will be observed that Mr. Jenkins describes the magnetism of the northern hemisphere as "boreal." Contrary to the current theory, he holds that the north end of the compass-needle is a true north pole, and that the facts observed are, when properly understood, in full accord with the great magnetic truth that like poles repel and unlike poles attract.

After submitting the evidence in favor of this view, Mr. Jenkins argues in this wise: If the north end of the dipping needle is a south pole, its pointing to the ground in Boothia (where Sir James Ross located the earth's north magnetic pole) must be attributed to attraction. If it is attracted it is attracted by something either in the crust of the earth or at the center of the globe. If there is something in the earth's crust which attracts the needle in Boothia, it ought to attract the needle in London. But the needle in London is attracted neither to the crust at Boothia nor to the earth's center. The truth is, Mr. Jenkins believes, that the north pole of the needle pointed to the ground almost perpendicularly in Boothia because it was repelled by the true north magnetic pole in the atmosphere above that region when Sir James Ross was there 50 years ago.

Further evidence as to the existence of the alleged magnetic belts above the earth's surface is promised. Meantime, it is of the first importance, Mr. Jenkins thinks, that it should be clearly settled whether the magnetic pole remains in or above Boothia. According to his calculation it should now be in latitude 72°, longitude 115°, in Prince Albert land.—*Scientific American.*

The Needed Motor.—The demand to which we have so often referred—a motor fitted for street railways—is felt in Europe, and the British Lords have been investigating the subject, and recommend the passage of a law permitting the use of such. They approve a locomotive worked by compressed air as more promising and desirable than any other, and advocate the use of steam engines in streets until a better discovery is made. The demand is for a simple power that can be attached to any car and that will draw it without fire. It is out of belief that science is stalled by so simple a demand. Study has not been given the problem. An insured reward would eventually discover it, and release countless horses, reduce fares, increase speed and avert injuries. We claim an unequaled ingenuity, and apply it to telephones and improve stoves and shoe-brushes. Here is a call for it, and every day that call grows more urgent. The wonder is that it has not been heeded, and that some slight machine or agent has not been found that will propel a car, a carriage, a sewing machine, a churn, turn a lathe, and be many men and horses in one. Let us have this instead of new designs for perpetual motion and new combinations for an elixir, and fortunes will repay the invention.—*North American.*

Petroleum as Fuel.—Producers are gradually beginning to use petroleum as fuel under boilers, and they find it cheaper by far than coal. One large producer in the lower oil country, who is trying it, says that one barrel of oil a day with the gas from the wells, gives him sufficient fuel under a boiler that is pumping three wells. Before using petroleum, he was burning $2 worth of coal a day. In the Bradford region, the petroleum burner is being introduced successfully, as well as in manufacturing establishments. But many hundred barrels per day more could be consumed if producers would but interest themselves in thus aiding the consumption of their product. Thousands of barrels daily could be used in this way, with a corresponding benefit to producers in better prices.—*Ex.*

The Earth Belongs to China.—Dr. Schliemann has found Chinese vases and gauze linen on Trojan soil, dating 1,200 years before Christ. They were on this coast in the fifth century, and are now taking possession of it by right of prior discovery. Li-Fang-pao contends that the Hyperboreans were Chinamen, while here it is claimed that the Lepere are Chinamen.

Magnetizing Molten Iron.

In a letter to Dr. C. W. Siemens, and communicated by him to the British Society of Telegraphic Engineers, Mr. E. Chernoff records a very curious experiment: Believing that if it were possible to magnetize white cast iron a magnet of greater permanence than any made of steel would be obtained, Mr Chernoff cast some white refined iron in a mold, surrounded by an electro-magnetic reel, along which a current was allowed to flow during the process of casting, so that the fluid metal became magnetic, and cooled under the influence of the magnetic current.

The result so far justified the expectation as to give a magnetized bar of white cast iron; but the form of the bar was unlike what was expected. While pouring the metal into the mold and until the metal set, Mr. Chernoff observed a singular agitation of the metal, which could not have proceeded from damp, as the mold was thoroughly dry. On cooling the bar proved to be hollow, the cavity being symmetrical and extending about two-thirds the length of the bar. The metal was thinnest just opposite the center of the reel, where it did not exceed the thickness of writing paper. The agitation of the metal in cooling is accounted for by the repulsion of the molten metal toward the poles of the magnet.

By casting under pressure it may be possible to obtain by this method extremely permanent and powerful magnets of white iron. Possibly also this experiment may lead to some useful modification of industrial processes for casting hollow cylinders without cores.

Telephone an Instrument of the Present.

There are said to be about 30,000 telephones now in service in this country, and only 500 in England—a fair sample of the greater quickness of the younger country to adopt new inventions. Prof. Wm. Henry Preece, an eminent English electrician, recently said he did not think that the telephone would be an instrument of the future, and be largely adopted by the public; "for although it had been largely adopted in America, we had not the same necessity for it, for we had a superabundance of messengers for all purpose, which the Americans had not."—*Ex.*

Perhaps not. We must, however, give Prof. P. credit for his foresight. The telephone, truly, will not be an instrument of the *future*, because in this country, at least, it is an instrument of the *present*, and as to England, refer to the following:

Twelve sets of telephones have been sent out to Sir Garnet Wolseley, for use at the seat of war in South Africa. The great advantage of the telephone over the telegraph, is that the General can carry on confidential talk with the officer at the district station, or a soldier can creep out toward the enemy's lines and whisper back the information as to position. A fine wire—the thinner the better—is all that is needed. This the soldier carries on a reel upon his back— a mile weighing only a few pounds. This will be the first time the telephone has been used as an instrument of warfare.

Artificial Sandstone.—*Glaser's Annalen* contains a description of an improved method and apparatus for the manufacture of artificial sandstone. A thorough mixture of four to six parts of fine sand, and one part of slaked lime is exposed for about three days to a high temperature and a pressure of more than three atmospheres, causing the formation of a silicate of lime which acts as a cement, so that the mass, when cooled down to the ordinary temperature, hardens. This hardening process continues for some weeks by exposure to the air, so that finally a product is obtained which is as hard and solid as good sandstone. The apparatus consists of a tank, into which the mixture is filled, and in which it is heated and stirred by a steam pipe, provided with a number of arms and rotated by belting or gearing. After the mixture has reached the proper temperature the steam is cut off, and a second vessel, inclosing the tank on all sides, is put into communication with the boiler. By this means the mass is heated for the period necessary. It is then run into a brick machine and shaped into the forms required. The process, it is claimed, effects great economy, especially for the manufacture of window sills, etc. The apparatus used is made large enough to produce 250 cubic feet of material in every charge—requiring, generally, three to four days.

Gas and Electricity.—After a full survey of the field the New York *Times* concludes that gas companies have been driven from every stronghold except that of purely domestic illuminating by the electric light, and that they may be driven from that before the year 1879 closes. There are four electric lamps claiming to meet the conditions of subdivision, namely, Edison's, Holcombe's, Werdermann's and Fuller's, with one comprehensive method of subdivision, D'Ivernois', and one double-circuit generator, that of Mr. Keitb. Neither of these has yet been submitted to test on a comprehensive scale, but all have done satisfactory work in the laboratory, and one of them, Werdermann's, has been tested in out-door experiments equivalent to street lighting. We have already referred to the fact that electricity and gas are not exclusives. A more perfect system of illumination will be introduced, and gas find other and more appropriate uses than as a means of illumination, as cooking, heating, etc.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending June 26		Week Ending July 2.		Week Ending July 10		Week Ending July 17.	
Alpha	30	25¼	28	24	28	25¼	26¾	25¼
Alta	8⅜	6⅜	10⅞	6¾	12¼	9	11	8⅜
Andes	1	75c	1.45	90c	1¼	1.15	1.20	1
Alps	....	....	....	....	....	....	....	....
Argenta	1.20	1	1.05	1	1	85c	1.05	90c
Atlantic	35c	30c	35c	30c	40c	....	35c	....
Aurora Tunnel	70c	40c	1	60c	60c	50c	50c	20c
Baltimore Con	75c	....	....	....	....	....	....	....
Belcher	7	6¼	6⅜	6	6¼	4.95	5⅜	4.90
Belmont	30c	....	40c	35c	40c	....	50c	40c
Best & Belcher	19¼	17⅞	19	17¼	20	18	18	16⅞
Bullion	9¼	7⅞	8	7⅞	7⅞	6	6⅜	6⅜
Bechtel	2.15	1.65	2.30	1.95	2½	2	1.95	1.60
Belle Isle	1.70	1½	1.60	1.45	2½	1.65	2.90	2½
Bodie	42	20¼	24½	22½	22	20¾	20¼	18½
Benton	6	4½	7¾	5¼	8⅜	6½	7¼	6⅛
Bulwer	10	9	10	9	9	....	8½	8
Boyle	....	....	....	....	....	....	....	....
Black Hawk	2.60	2.10	2.15	2	2	1⅜	1.70	1
Belvidere	1.90	1.60	1.95	1¾	1½	1	2¼	1.10
Booker	1.60	1	1.40	1	1½	1.10	1¼	65c
Caledonia	2.80	2½	2.60	2¼	2.60	2¼	2.40	2.05
California	5⅜	5¼	5⅜	5¼	5	4¾	4.90	4⅞
Challenge	3.05	2.90	2.95	2.80	2⅞	2¼	2.60	2
Chollar	9	7⅞	8¾	7⅞	8	6⅞	7⅞	6
Confidence	16	14	16¾	13½	12½	12	11½	10½
Con Imperial	2.20	1.80	1.90	1.70	1.95	1.60	1⅞	1½
Con Virginia	5⅞	5¼	5⅜	5¼	5	4½	4.85	4.65
Crown Point	5⅞	4¾	4.80	4¼	5⅜	5	5¼	4.90
Con Washoe	55c	45c	....	....	....	....	....	....
Champion	50c	40c	65c	60c	75c	55c	80c	55c
Concordia	....	....	....	....	....	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	5c	....	25c	5c	25c	....	20c	15c
Daney	....	....	....	....	....	....	....	....
Day	....	....	35c	30c	35c	30c	30c	20c
Eureka Con	17	15¼	17	16½	16⅛	15⅞	16½	15¼
Exchequer	9	7½	8	7⅜	7⅜	6⅛	7	6¼
Endowment	25c	....	35c	30c	35c	....	45c	35c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	4.05	3.80	4	3½	3.90	3.80	4	3½
Gila	1.55	90c	1.30	95c	1	1.15	1.10	1
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	15⅞	....	14	....	13½	12	13¾	....
Goodshaw	70c	60c	....	....	80c	45c	50c	40c
Gould & Curry	13½	11⅜	12¾	12	12⅞	11¼	10⅞	10⅜
Hale & Norcross	18½	15⅞	18	16	17¼	14½	15¼	12½
Hillside	1.90	1½	1⅞	....	1⅞	....	1⅞	1½
Highbridge	30c	....	25c	15c	25c	....	25c	20c
Homestake	....	....	....	....	....	....	....	....
Hussey	10c	5c	25c	20c	25c	20c	25c	15c
Independence	2.90	2.60	2½	2¼	2½	2¼	2.55	2.30
Julia	4.35	3.90	5.40	2¼	4¼	3¼	3⅞	3½
Justice	4.20	3¼	4.90	4	5⅜	4½	5½	4½
Jackson	5½	....	5	....	5	....	4½	4
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	5¼	5	5	4.60	4½	4	4.60	4.10
Kossuth	20c	15c	....	....	....	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	1⅜	1¼	1.30	1	1.40	1	1.20	90c
Lady Wash	2.30	1½	2.85	1.60	2.80	1⅜	2	1⅞
Leopard	1.20	1.05	1.10	1	1.20	90c	1.60	1
Leviathan	80c	70c	75c	70c	75c	65c	65c	55c
Leeds	90c	75c	....	....	1	....	80c	70c
Lee	....	....	....	....	....	....	....	....
May Belle	75c	50c	70c	45c	50c	....	40c	30c
Modoc	1½	1	....	....	....	....	....	....
Manhattan	2¾	2½	3	2½	3	2½	3.10	2¾
Martin White	7	....	7	5¼	6	5⅜	6	5⅝
McClinton	1.60	1½	1½	1.40	1.40	1¼	1½	1¼
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	32½	26¼	27¾	26¼	25¾	24	26¾	23
Mides	....	....	....	....	....	....	....	....
Morning Star	3	....	....	....	....	....	....	....
North Con Virginia	8⅞	8½	9¼	9	9¼	9	9¼	9
New York	95c	65c	90c	65c	1.15	70c	75c	60c
Northern Belle	6	5⅝	5⅞	....	5¼	5	5	4
New Coso	20c	....	20c	....	....	....	....	....
Navajo	45c	40c	40c	25c	40c	30c	45c	40c
Occidental	1	85c	1	80c	1	90c	1	85c
Ophir	35	31	31⅞	30¼	31½	29	37	31
Oriental	85	45	40c	25c	25c	....	25c	20c
Overman	12¾	10	11⅞	10½	11	9	10¼	9
Panther	....	....	....	....	....	....	....	....
Phenix	3½	3¼	3	2.90	3	....	....	....
Phil Sheridan	80c	65c	75c	60c	70c	....	....	....
Potosi	6⅜	5¼	6	5¼	5⅞	4½	5	4¾
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	5½	4¼	4	....	4	3.90	4.10	3.90
Richer	85c	70c	1½	95c	1¼	40c	90c	60c
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	17⅞	15	17	15¼	15⅜	13½	14⅞	12½
Seg Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	48	43½	46¾	43	41¼	37	42½	38¼
Silver Hill	2¼	1.80	2.20	1.80	2½	1⅞	1.70	1¼
Silver King	7	....	8	7	8	7	7½	7
Silver Prize	....	....	....	....	....	....	15c	....
Succor	1½	5c	15c	10c	15	10	15c	10c
Summit	2.80	2	2¼	2.30	3	2.65	2¼	2.10
Scorpion	2.90	2¼	2½	2	2.10	2	2.10	1.70
Solid Silver	45c	40c	45c	40c	40c	25c	35c	20c
South Bodie	45c	40c	45c	35c	40c	35c	40c	30c
South Standard	30c	25c	25c	20c	25c	20c	25c	20c
Star	40c	25c	40c	25c	50c	....	75c	50c
St. Louis	....	....	....	....	....	....	....	....
Syndicate	7	6	8¾	6	8¼	7½	8	7½
Tioga Con	6⅞	4.95	7¾	6¾	6⅜	4.90	5⅜	4.60
Tiptop	1¼	1.15	1.15	1.10	1.10	1	80c	75c
Trojan	35c	25c	25c	....	25c	....	....	....
Union Con	61	43	45	40¼	39	32	38	36½
Utah	22¾	21	22	20	19	15⅞	18¾	17¼
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.60	1½	1.65	1½	1.45	1⅛	1.40	1¼
Wells-Fargo	20c	....	....	....	....	....	....	....
Woodville	50c	30c	30c	25c	50c	30c	50c	40c
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	19⅞	17	17⅝	17	16¾	14¼	15¼	14¾

Sales at S. F. Stock Exchange.

Friday A. M., July 11.

35 Alpha....26
730 Andes....1@1.10
925 Alta....8¾@9
690 Bullion....6½@6⅞
175 Best & Belcher..16¾@17¼
1545 Belcher....5@4.90
1105 Benton....6⅞@6½
130 Confidence....11½@10¾
385 California....4⅞@4.85
330 Caledonia....2.40@2.30
340 Con Virginia...4.55@4.60
670 C Dorado....2@1.90
680 Chollar....6½@6
125 Challenge....2.20@2.10
750 Con Imperial....1.65
230 Crown Point....4.90@5
1245 Exchequer....6¼@6½
590 Europa....20c
130 Flowery....50c
710 Gould & Curry...10⅞@10½
200 Hale & Nor....12½@13
670 Julia....3½@3.55
605 Justice....4.70@4½
40 Kentuck....4.10
415 Lady Wash....1.80@1.85
1550 Lady Bryan....1
245 Mexican....23@23¼
275 Mackey....1¼@1.20
200 Mt View....2.30@2½
200 North Con Vir....9¼
410 N Bonanza....1.60
370 New York....70@65c
180 Occidental....90c
65 Ophir....31@31¼
215 Overman....9@9¼
60 Potosi....4.80
315 Savage....12⅞@12½
80 Silver Hill....1.65
1200 S Utah....5@10c
300 Solid Silver....30@25c
380 Scorpion....2.05@2
115 Union Con....37
55 Utah....18@17½
865 Ward....1¼@1.30
100 Woodville....40c
100 Yellow Jacket....15

AFTERNOON SESSION.

400 Albion....25c
950 Adenda....60@55c
150 Argenta....90c
1570 Booker....1½@1.05
205 Belvidere....2¼
70 Black Hawk...1.70@1.60
35 Bulwer....8¼@8½
250 Bodie....20
1440 Belle Isle....2.55@2½
750 Bechtel....1.95@1.85
425 Belmont....40c
1500 Champion....60@65c
1300 Crœsus....20@15c
450 C Pacific....7½@7
770 Dudley....1½@1.65
250 D Standard....1
300 Day....20c
250 Defiance....1.30@1¼
300 DeFrees....20c
200 Endowment....35@45c
95 Eureka Con....15⅞
700 Fourth July....75c
100 Glynn Dale....50c
340 Goodshaw....50@40c
120 Grand Prize....3½@3¾
150 Hussey....25c
1005 Hamburg....50@70c
260 Hillside....1⅜@1½
1130 Independence....2½@2.55
1160 Jupiter....2.15@2½
100 Jackson....4½
665 Leopard....1@1.10
100 Martin White....6
615 Mammoth....10
245 Mono....8½
1015 Manhattan....3.10@3
550 McClinton....1.45@1½
300 Mt Diablo....2⅞
300 Navajo....40@45c
140 Northern Belle..4¼@4.40
1850 Orient....60@40c
400 Oriental....25c
175 Paradise....1½@1⅞
950 Queen Bee....50@60c
150 Richer....90@80c
120 Raymond & Ely...4@3.90
510 Red Cloud....50@60c
125 Syndicate....7½@7⅞
350 Star....60c
455 Summit....2¼@2½
450 S Bulwer....1
190 S Bodie....35@40c
400 S Standard....25@20c
550 Tiptop....80c
740 Tioga Con....5¾@5⅞
1300 University....60@50c
200 Vortex....75c
20 W Pacific....50c
200 Wales....3

Saturday A. M., July 12.

300 Albion....25c
820 Alta....9¼@9⅝
10 Alpha....26¾
840 Andes....1.10@1.20
100 Argenta....95c
50 Aurora T....50c
140 Adenda....50@60c
200 Best & Belcher....17¼
435 Belcher....5⅜@5¼
2075 Bullion....6⅜@6⅛
1240 Benton....7@7¼
250 Belmont....40c
1910 Belle Isle....2¼@2.55
550 Bechtel....1.90@1.80
375 Bodie....19⅞@20
760 Belvidere....1.15@1.40
545 Booker....1.05@1
20 Confidence....11½
370 California....4.80@4⅞
95 Chollar....6¼
155 Con Virginia....4⅞
415 Crown Point....5¼@5
720 Con Imperial....1.70@1⅞
50 Challenge....2.40
320 Caledonia....2¼@2.20
480 Con Dorado....1.90
200 Caledonia (B H)....3
570 Champion....55@65c
100 Crœsus....20c
295 C Pacific....7
600 Day....30c
25 Defiance....1.40
450 Dudley....1.60@1.55
100 D Standard....1
200 Eureka Con....15½@15⅜
200 Europa....20c
1875 Exchequer....7@6⅞
110 Flowery....50c
315 Gould & Curry...10½@10¼
200 Grand Prize....3.85@3.90
650 Gila....1.10@1.05
350 Goodshaw....45@50c
1100 Glynn Dale....50c
355 H & Norcross....13⅞@14
300 Hillside....1⅞
1000 Hamburg....65c
1100 Independence....2.35
800 Jupiter....2.15
55 Justice....4⅞@4.70
425 Julia....3¼@3.60
50 Jackson....4¼
100 Kentuck....4.10
150 L Bryan....1.05
305 L Wash....1.95@1.90
100 Leviathan....65@60c
675 Leopard....1½
675 Leeds....75@80c
670 Mexican....24½@25
250 Mackey....1.20@1¼
100 Mt View....2.40
300 Manhattan....3
100 McClinton....1½
130 Mammoth....10
280 Mono....8¼
300 M White....5¼
415 Northern Belle...4@4.10
250 N Bonanza....1.60
335 New York....70@60c
60 N Con Virginia....9¼
360 Ophir....33⅞@33⅜
50 Overman....9¼
100 Occidental....1
50 Oriental....25c
560 Orient....50c
90 Queen Bee....60c
300 Red Cloud....60c
100 Richer....85c
135 Savage....13¼@12¾
320 Sierra Nevada....39@38¼
125 Star....50@60c
200 Succor....10c
550 Silver Hill....1.70@1½
230 Scorpion....2@2.05
1600 S Utah....10@5c
575 Syndicate....8
250 South Bodie....35c
100 S Standard....20c
1165 Tioga....5⅞@5⅜
425 Tiptop....80c
180 Union Con....37½@37
15 Utah....18¼@18
920 University....55@70c
250 Vortex....75c
380 Ward....1.30
100 W Pacific....50c
50 Woodville....45c
185 Yellow Jacket...15½@15⅜

Monday A. M., July 14.

110 Alpha....26¾@26¼
2070 Alta....11@9⅞
370 Andes....1¼@1.15
930 Bullion....6⅞@6¼
680 Belcher....5⅜@5⅝
295 Best & Belcher...18@17¼
1420 Benton....6⅞@7
350 C Dorado....2.10
145 California....4⅞@4.60
60 Confidence....11¼@11
475 Con Imperial....1¼@1.70
60 Crown Point....5¼
560 Con Virginia...4.60@4.55
130 Chollar....6¼
45 Challenge....2½
210 Caledonia....2¼@2.05
665 Exchequer....6⅞@6¼
200 Europa....20@25c
200 Flowery....55@50c
295 Gould & Curry...10¼@10½
155 Hale & Nor....13½@13
735 Julia....3½@3.60
1310 Justice....5¼@5⅞
50 Kentuck....4.10@4¼
200 Lady Bryan....1@1.05
6585 Lady Wash....2@1.80
100 Leviathan....60c
595 Mexican....24½@24
400 Mackey....1¼
560 N Bonanza....1⅞@1.70
270 North Con Vir....9¼
350 New York....75@70c
365 Ophir....34¼@34⅞
85 Overman....9½@9⅞
100 Occidental....85c
295 Potosi....4¾@4.80
50 Scorpion....2.10
125 Savage....13@13¼
100 Silver Hill....1.60
1300 S Utah....5@10c
165 Sierra Nevada....40⅞@41
60 Utah....17½
35 Union Con....37¼@37
510 Ward....1.40
325 Woodville....40@45c
150 Yellow Jacket....15⅞@15½

AFTERNOON SESSION.

300 Adenda....50@55c
625 Aurora T....50c
500 Albion....25c
270 Argenta....90c@1
40 Bulwer....8¼
250 Bodie....20@20½
1135 Bechtel....1⅞@1.80
1275 Booker....1.10@1
435 Black Hawk....1.40@1
1830 Belle Isle....2⅞@2.70
130 Belvidere....1¼@1.15
50 Belmont....45c
1450 Champion....60@65c
800 Crœsus....20c
140 C Pacific....7@6⅞
100 DeFrees....15c
600 D Standard....1
400 Day....30c
590 Dudley....2
820 Defiance....1½@1¼
275 Eureka Con....16½@16
100 Fourth July....70c
200 Glynn Dale....50c
100 Glory....75c
1100 Goodshaw....50c
280 Grand Prize....3½@3¾
920 Gila....1.05
200 Hillside....1½
500 Hamburg....55@60c
550 Highbridge....25@20c
250 Hussey....20c
1510 Independence...2½@2.30
250 Jupiter....2
100 Leeds....75c
1670 Leopard....1.60@1½
300 Mammoth....10½
20 M White....6
315 Mono....7@8
150 May Belle....40c
300 McClinton....1.30
140 Mt Diablo....3
820 Manhattan....2.90@3
60 Northern Belle....4
200 Oriental....25c
1685 Orient....75@85c
150 Paradise....1.60
225 Queen Bee....60c
15 Richer....75c
60 Raymond & Ely..4@4.10
600 Red Cloud....60c
600 Summit....2.40@2.10
90 Silver King....7½
300 Silver Prize....15c
640 S Bulwer....90@85c
610 Syndicate....7½@8
850 Star....55@60c
850 South Standard....20c
660 S Bodie....30@40c
25 Tuscarora....15c
700 Tiptop....80c
1590 Tioga Con....4⅞@4.60
1090 University....65@55c
400 Vortex....60@70c
50 Wales....3½

Tuesday A. M., July 15.

60 Alpha....26
810 Alta....9¼@9⅜
1070 Andes....1@1.15
1040 Bullion....6⅜@6½
820 Belcher....5¼@5
25 Best & Belcher....17¼
1625 Benton....6¾
805 California....4.85@4¾
210 Confidence....11@10½
320 Challenge....2¼@2
2060 Con Imperial....1⅜@1.70
265 Crown Point....5@5¼
305 Chollar....6¼@6⅞
640 Con Virginia....4.70@4⅞
240 Caledonia....2¼@2.15
650 Con Dorado....1.90
865 Exchequer....6⅜@6½
250 Europa....25c
525 Flowery....50c
165 Gould & Curry....10¼
190 H & Norcross....14
90 Julia....3½@3.55
795 Justice....5¼@5
10 Kentuck....4.40
200 Leviathan....60c
560 L Bryan....1@1.20
590 Lady Wash....1.80@1.70
500 Margarita....35c
375 Mexican....25¾@26¾
100 Mount View....2½
450 Mackey....1.30
700 N Bonanza....1⅜@1.70
65 North Con Vir....9⅜
230 New York....75@70c
25 Ophir....35¼
200 Occidental....90c
70 Overman....9⅞
180 Potosi....4.85
70 Solid Silver....25c
100 S Potosi....65c
670 Silver Hill....1.60@1½
500 Succor....10@15c
365 Scorpion....1.90@2
320 Sierra Nevada....42@41⅞
860 Savage....13@13¼
400 S Utah....10c
130 Utah....17½@17¼
1000 Union Con....38@37½
650 Woodville....50@45c
1395 Ward....1.40@1.35
175 Yellow Jacket....15@14⅞

AFTERNOON SESSION.

285 Addenda....50c
90 Aurora T....20@30c
870 Argenta....1
40 Bodie....20½
455 Bechtel....1⅞@1.60
500 Belle Isle....2½
5 Bulwer....8¼
250 Black Hawk....1.45
1025 Booker....95c@1
100 Belvidere....1.10
1350 Champion....80@75c
345 C Pacific....7½@7
600 Crœsus....15@20c
1045 Dudley....1.95@2
175 D Standard....1.10
1160 Defiance....1½@1.40
250 Day....25c
410 Eureka Con....16¼@16
100 Fourth of July....60c
50 Golden Terra....13⅞
20 Glory....75c
750 Gila....1.05@1.10
405 Goodshaw....50c
420 Grand Prize....4
800 Hussey....20@15c
200 Hamburg....50c
10 Hillside....1.70
1380 Independence....2½@2.45
230 Jackson....4¼@4
400 Leopard....1½
120 Mammoth....10⅞@10⅝
370 Martin White....5⅞
310 Mono....6½@6⅞
350 May Belle....35c
310 McClinton....1¼@1.30
510 Mt Diablo....3@4
570 Manhattan....2.80@2⅞
415 Northern Belle..4¼@4.40
90 Oriental....20c
2050 Orient....65@60c
210 Paradise....1½
110 Queen Bee....60c
410 Richer....75@60c
100 Red Cloud....50c
260 S Standard....20c
200 Summit....2¼@2.35
210 Syndicate....7½@7⅞
600 S Bodie....35@40c
150 Silver King....7
300 Silver Prize....15c
430 Star....75@65c
1240 S Bulwer....80@75c
50 Tiptop....80c
490 Tioga....4.90@5
880 University....65c
100 Vortex....65c
100 W Pacific....40c
100 Wales....3½@3¾

Wed'sday A. M., July 16.

1430 Alta....9⅜@9¼
1055 Andes....1@1.20
320 Atlantic....35c
860 Bullion....6¼@6⅜
975 Benton....6¼@6⅞
85 Belcher....5⅛
150 Best & Belcher....17⅞@18
80 California....4.85
120 Confidence....11¼@11½
200 Crown Point....5⅛
940 Con Imperial....1.65
380 Con Dorado....1.90
400 Challenge....2.35@2¼
310 Caledonia....2¼@2.35
215 Con Virginia....4.80@4⅞
370 Chollar....6⅞@7¼
100 Europa....25c
480 Exchequer....6⅜@6½
100 Flowery....50c
150 Fairfax....1
270 Gould & Curry...10⅜@10⅞
240 Hale & Nor....15@14⅞
200 Julia....3.60@3⅞
820 Justice....5⅜@5¼
225 Lady Bryan....1.05
405 Lady Wash....1.90@1.85
700 Mackey....1.40@1¼
180 Mexican....25@24½
200 Mountain View....2.30
940 N Bonanza....1.55@1½
185 North Con Vir....9¼@9
550 New York....70@60c
220 Occidental....95c@1
365 Ophir....34⅞@34
140 Overman....10¼@10
30 Potosi....4.90
240 Scorpion....1⅞@1.90
215 Savage....14⅜@14
175 S Potosi....85c
870 Silver Hill....1.60@1½
300 S Utah....5@10c
200 Succor....15c
270 Sierra Nevada...41⅞@42½
35 Utah....18
50 Union Con....36½@37
650 Ward....1.40
100 Woodville....50c
120 Yellow Jacket....14⅞

AFTERNOON SESSION.

1515 Argenta....1@1.05
850 Aurora....30c
625 Addenda....50c
950 Belmont....45@50c
730 Bodie....19@18½
100 Black Hawk....1.40
595 Bulwer....8¼@8
955 Booker....85c@1
450 Belvidere....1.15@1.10
1950 Belle Isle....2⅞@2.90
920 Bechtel....1⅞@1.60
1900 Champion....80c
750 Crœsus....10@20c
575 C Pacific....7⅞@7½
200 DeFrees....15c
120 Dudley....1.80@1⅞
40 Defiance....1½
475 D Standard....1@1.05
70 Eureka Con....16@15⅞
2675 Gila....1@1.10
550 Grand Prize....4@3.90
810 Goodshaw....50@45c
100 Golden Terra....13⅞
90 Glory....80@85c
200 Hussey....20c
100 Hillside....1.60
100 Hamburg....50c
330 Independence....2¼@2.35
110 Jackson....4
235 Jupiter....1½@1⅞
320 Leopard....1.60@1.55
50 Leeds....70c
335 Manhattan....2⅞
295 Mt Diablo....4½
405 McClinton....1.35@1¼
960 Mono....7⅞@8
75 May Belle....30c
450 Martin White....5⅞@5⅝
110 Mammoth....10⅞@11
100 Northern Belle...4.65@5
1200 Oriental....20@25c
1400 Orient....50@60c
50 Paradise....1.55
300 Queen Bee....60c
50 Raymond & E....4
50 Red Cloud....55c
260 Richer....85@75c
300 Rustler....60c
200 Silver Prize....20c
1020 Star....70@60c
380 Summit....2½
505 Syndicate....7½
300 S Bodie....35c
200 S Standard....25@20c
1120 S Bulwer....80@85c
300 Tiptop....80@75c
1235 Tioga Con....4½@4.30
850 University....65c
870 Vortex....35@60c
100 Wales....3½

SALES OF LAST WEEK AND THIS COMPARED

Thursday A. M., July 10.

335 Alpha....28@27
850 Alta....9⅞@9¼
1215 Andes....1¼@1.15
105 Best & Belcher....18
915 Bullion....6⅜@6½
755 Belcher....5@4.95
1080 Benton....6⅞@6⅝
120 California....4.90@4.95
199 Con Virginia....4.85@5
760 Chollar....7@6⅞
1070 Crown Point....5@5¼
1650 Con Imperial....1⅞@1.80
250 Confidence....12@12½
235 Caledonia....2.45@2.40
210 Challenge....2½
650 C Dorado....2.10
895 Exchequer....6½@6⅝
1490 Flowery....50c
640 Gould & Curry...11⅞@11½
30 Hale & Nor....14½
290 Justice....4.70@4.65
505 Julia....3⅞@3.80
120 Kossuth....4¼
1185 L Bryan....1¼@1.40
300 Lady Wash....1.80@1.85
110 Leviathan....65@70c
240 Mexican....25⅞@25½
100 Mt View....2.40@2½
100 Mackey....1.30@1¼
800 New York....75@80c
135 N Con Vir....9@9¼
675 N Bonanza....1⅞@1.70
160 Ophir....31@31¼
125 Overman....9⅞@9½
270 Potosi....5@4.90
375 Savage....13⅞@13⅝
495 Sierra Nevada....40@41½
100 Succor....10c
300 Silver Hill....1⅞@1.80
300 Solid Silver....30c
160 Scorpion....2@2.10
200 S Potosi....90@85c
350 S Utah....15c
50 Trojan....25c
130 Utah....16¼@18
325 Union Con....39@38
310 Woodville....40@30c
800 Ward....1.45
225 Yellow Jacket....15½

AFTERNOON SESSION.

550 Argenta....95c@1
880 Albion....30c
300 Aurora T....50@60c
1300 Addenda....60@55c
480 Booker....1.15@1.10
65 Bulwer....8⅞@8
735 Bodie....21@21¼
810 Bechtel....2.15@2.10
300 Belvidere....1.40
2570 Belle Isle....2½@2.60
1870 Black Hawk....1⅞@1.80
230 Belmont....40c
300 Caledonia (B H)....3
100 Crœsus....20c
3675 Champion....50@65c
105 C Pacific....7½@7⅞
350 D Standard....1
350 Defiance....1.60@1⅞
660 Dudley....1.60@1½
500 Endowment....35c
405 Eureka Con....15@15⅞
50 Golden Terra....13
1400 Goodshaw....50@40c
50 Glynn Dale....50c
160 Grand Prize....3.90@3½
1040 Gila....1.20@1
200 Hussey....25c
65 Hamburg....50c
300 Hillside....1⅞
1330 Independence...2.30@2½
120 Jackson....4¼
805 Jupiter....2
1210 Leopard....1@1.10
50 Leeds....1
270 Mammoth....10
400 May Belle....50c
330 Mono....9⅜@9½
200 McClinton....1.60@1.55
290 Mt Diablo....3
1230 Manhattan....3@2.90
160 Northern Belle....4⅞
400 Navajo....45@50c
1800 Orient....90@80c
800 Oriental....25c
200 Phenix....3
200 Queen Bee....50@60c
500 Richer....90@70c
155 Raymond & Ely..4@3.90
220 Red Cloud....50@70c

Thursd'y A. M., July 17.

50 Alpha....25½
570 Alta....9¼@9⅜
250 Andes....1.05@1.15
170 B & Belcher....17⅞@18
135 Belcher....5¼@5
380 Bullion....6¼@6⅜
735 Benton....6⅛@6¼
190 California....4.90
10 Crown Point....5
275 Con Imperial..1.70@1.65
100 Con Virginia....4.85
170 Chollar....6⅞@7
60 Confidence....11½
250 Caledonia....2¼
180 Challenge....2¼@2.60
1850 Con Dorado...2.10@2.05
525 Exchequer....6½@6⅝
100 Europa....25c
50 Flowery....50c
280 Gould & Curry..10⅞@10¾
285 Hale & Nor....15¼@15
630 Justice....5½@5⅜
75 Julia....3.65@3.60
190 Kentuck....4½@4.60
325 Lady Bryan....90c@1
450 Lady Wash....1.80@1⅞
180 Leviathan....55@60c
600 Mexican....26@26¼
100 Mt View....2.30
950 Mackey....1.40@1.46
765 N Bonanza....1½@1.40
350 New York....60c
265 North Con Vir....9¼@9¼
880 Ophir....37@36¼
45 Overman....9⅞
835 Potosi....4.90@5
190 Savage....14¼
140 Sierra Nevada...42¼@42½
275 Silver Hill....1.60
500 S Utah....10@5c
160 Solid Silver....30c
140 Scorpion....1⅞@1.70
320 Union....37@36⅞
15 Utah....17¼@18
460 Woodville....50c
220 Ward....1.35@1.30
50 Yellow Jackot...15¼@15¼

AFTERNOON SESSION.

740 Aurora T....30c
1410 Addenda....50c
1150 Argenta....1.30@1.40
310 Booker....1.05@1.10
1830 Black Hawk....1½
290 Belvidere....1.15
30 Bulwer....7½@8
210 Bodie....17@17¼
130 Bechtel....1⅞@1.70
1170 Belmont....45c
1030 Belle Isle....3
1420 Champion....70c
185 Con Pacific....7⅞@8
20 Caledonia (B H)....3⅞
200 Crœsus....20c
100 DeFrees....15c
490 Dudley....1.80@2
350 Defiance....1.30
350 D Standard....1
45 Eureka Con....15⅞
50 Goodshaw....45c
80 Grand Prize....3.95
950 Gila....1.05
100 Hussey....20c
700 Highbridge....20c
250 Hillside....1½
1430 Independence...2¼@2.35
20 Jackson....4¼
105 Jupiter....1¾
140 Leeds....75@70c
225 M White....5
245 Mammoth....11
520 Mono....8½@6⅞
715 McClinton....1.30@1¼
100 May Belle....45c
160 Mt Diablo....4½
450 Manhattan....2⅞@2.80
495 Northern Belle 4.80@4.90
100 Navajo....35c
350 Oriental....20@15c
650 Orient....60c
380 Paradise....1.40@1.60
1000 Queen Bee....60@65c
10 Raymond & Ely....4

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alta S M Co	Nevada	15	1 00	June 12	July 17	Aug 4	W H Watson	302 Montgomery st
Amazon Con M Co	Nevada	6	10	Mar 24	June 11	July 31	Jno Crockett	12 Cosmopolitan Hotel
Belmont M Co	Nevada	21	30	July 1	Aug 7	Sept 2	J W Pew	310 Pine st
Belvidere M Co	California	4	25	July 9	Aug 11	Sept 6	C V Hubbard	203 Bush st
Booker Con G M Co	California	3	50	June 30	Aug 4	Aug 25	W H Lent	309 Montgomery st
Brilliant M Co	Nevada	3	10	May 19	June 23	July 28	H S Stone	419 California st
Bullion M Co	Nevada	10	1 50	July 9	Aug 13	Sept 3	J Gruss	418 California st
Commonwealth Con M Co	Nevada	1	25	June 27	July 31	Aug 20	C A Morse	217 Sansome st
Crown Point G & S M Co	Nevada	37	1 00	June 4	July 11	July 29	Jas Newlands	203 Bush st
Exchequer M Co	Nevada	14	1 50	July 9	Aug 15	Sept 5	J Gruss	418 California st
Gila M Co	Nevada	4	20	Apr 30	June 3	July 14	———	328 Montgomery st
Goodshaw M Co	California	4	25	July 9	Aug 23	Sept 30	V Fernbach	327 Pine st
Gould & Curry S M Co	Nevada	36	1 00	July 10	Aug 14	Sept 3	Alfred K Durbrow	309 Montg'y st
Hussey Con G & S M Co	Nevada	8	15	May 27	July 1	July 22	Jno E Dixon	327 Pine st
Julia Con M Co	Nevada	9	1 25	July 8	Aug 13	Sept 4	H A Charles	419 California st
Jupiter M Co	California	4	25	July 5	Aug 11	Sept 4	E C Masten	22 Nevada Block
Justice M Co	Nevada	28	1 00	May 26	June 30	July 19	R E Kelley	419 California st
Leopard M Co	Nevada	11	50	June 11	July 15	Aug 5	J E Dixon	20 S F Stock Ex
Manhattan S M Co	Nevada	13	1 00	July 16	Aug 21	Sept 12	Jno Crockett	203 Bush st
N Noonday M Co	California	2	25	June 5	July 14	Aug 18	G A Holden	310 Pine st
New York M Co	Nevada	19	40	July 8	Aug 9	Aug 29	D L Thomas	203 Bush st
Real Del Monte M Co	Nevada	7	1 00	June 10	July 19	Aug 11	C V D Hubbard	203 Bush st
Savage M Co	Nevada	38	1 00	July 8	Aug 11	Aug 30	E B Holmes	309 Montgomery st
Sierra Nevada S M Co	Nevada	58	3 00	June 12	July 16	Aug 5	W W Stetson	309 Montgomery st
Solid Silver G & S M Co	Nevada	1	25	May 14	———	July 21	J J Applegate	331 Montgomery st
South Bulwer	California	4	15	July 16	Aug 20	Sept 12	Wm Stuart	320 Sansome st
Star M Co	Nevada	2	20	June 3	July 15	Aug 11	———	320 Sansome st
Summit G M Co	California	2	50	June 5	July 10	July 31	W H Lent	309 Montgomery st
Tioga Con M Co	California	6	25	June 19	July 21	Aug 6	W H Lent	309 Montgomery st
Trojan M Co	Nevada	11	25	July 14	Aug 18	Sept 8	David Wilder	328 Montgomery st
Union Con S M Co	Nevada	13	2 00	June 4	July 7	July 24	J M Buffington	309 California st
University G M Co	California	2	10	June 9	July 14	Aug 4	W Letts Oliver	328 Montgomery st
Ward G & S M Co	Nevada	4	50	July 2	Aug 7	Aug 27	J Stadtfeldt, Jr	26 Haywards Build
William Penn	Nevada	5	05	July 12	Aug 13	Aug 30	O J Humphrey	328 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Adams Hill Con M Co	Nevada	10	10	May 19	July 1	July 22	———	401 California st
Addenda G & S M Co	California	1	20	July 2	Aug 7	Aug 28	T H Dixon	238 Montgomery st
Ajax G & S M Co	California	2	10	June 11	July 14	Aug 1	A F Main	309 California st
Allison Ranch Ford G M Co	Cal	—	01	June 16	July 18	Aug 4	J E Carr	Grass Valley
America M Co	Nevada	1	50	May 9	———	July 31	Richard M Noyes	240 Montgomery st
Armand G & S M Co	California	1	10	June 9	July 28	Aug 25	J L Fields	240 Montgomery st
Armstrong G M Co	California	1	05	June 11	July 14	Aug 1	J W Pew	310 Pine st
Black Hawk G M Co	California	6	50	July 1	Aug 4	Aug 25	H A Charles	21 Haywards Build
Crœsus G & S M Co	California	1	05	June 16	July 21	Aug 14	E Hestres	328 Montgomery st
Curtis Con M Co	Nevada	1	10	July 11	Aug 11	Aug 30	H S Stone	419 California st
Dudley M Co	California	4	25	June 12	July 16	Aug 11	E C Masten	22 Nevada Block
Emigrant S M Co	California	4	50	May 10	July 3	July 23	B W Mudge	309 Montgomery st
Fall Creek M Co	California	3	40	June 11	July 22	Aug 14	C Robinson	310 Pine st
Florence Blue Gravel	California	4	05	April 18	———	July 29	F A McGee	Merchants Exchange
Giant and Old Abe M Co	California	1	50	June 4	July 15	Aug 14	———	49 Nevada Block
Gover M & M Co	California	38	50	May 21	July 1	Aug 11	W O Wilson	402 Front st
Hartford S M Co	California	1	50	June 18	July 21	Aug 13	S Heringhi	422 Montgomery st
Ida M Co	———	1	25	June 19	July 21	Aug 6	———	324 Pine st
Leo M Co	Nevada	5	50	June 14	July 13	Aug 8	J J Scoville	59 Nevada Block
Mayflower Grav M Co	California	5	10	June 17	July 22	Aug 8	J Monizio	328 Montgomery st
Mono G M Co	California	4	50	June 21	July 28	Aug 18	W H Lent	309 Montgomery st
Numa M Co	Nevada	1	03	June 13	July 24	Aug 11	D Wilder	328 Montgomery st
Oriental Con G & S M Co	California	3	25	June 25	July 25	Aug 11	H C Hinman	411 California st
Oroville Grav M Co	California	2	10	May 31	June 30	July 18	J T McGeoghegan	318 Pine st
Queen Bee M Co	California	4	10	July 10	Aug 30	Sept 2	T A White	113 Leidesdorff st
Rustler G M Co	California	1	10	June 30	Aug 4	Aug 18	A F Main	309 California st
Seg Europa M Co	Nevada	1	25	Apr 4	July 31	Aug 2	R B Noyes	240 Montgomery st
Sherwood Con M Co	Nevada	1	25	July 12	Aug 12	Aug 30	H S Stone	419 California st
Silver State M Co	Nevada	10	06	May 20	June 24	July 22	A Halsey	314 Montgomery st
Swansea M Co	California	1	10	June 14	July 21	Aug 11	F N Delaney	315 California st
Tellurium G & S M Co	California	18	10	May 29	July 5	July 31	J M Litchfield	415 Montgomery st
Union G & S M Co	California	20	05	June 9	July 10	July 26	R Vincent	Grass Valley
Wide Awake M & P Co	Arizona	7	02	June 23	Aug 1	Sept 1	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Benton Con Co	Nevada	Wm H Watson	302 Montgomery st	Annual	July 30
Bohemia M Co	———	J Klein	121 Sansome st	Annual	July 21
Calcutta G & S M	———	E W Worsham	418 California st	Special	July 24
Lady Bryan S M Co	Nevada	C Van Dyck Hubbard	203 Bush st	Annual	July 23
Lady Washington Con M Co	Nevada	Wm H Watson	302 Montgomery st	Annual	July 30
Newton Hyd D & M Co	California	O W Banks	320 Sansome st	Special	July 29
Union Con S M Co	Nevada	J M Buffington	309 California st	Annual	July 21
Yellow Jacket S M Co	Nevada	M Otey	Gold Hill, Nev	Annual	July 21

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Belle Isle M Co	Nevada	John E Dixon	Stock Exchange	25	July 15
California M Co	Nevada	C P Gordon	23 Nevada Block	50	June 17
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	50	June 16
Excelsior W & M Co	California	G P Thurston	315 California st	25	Apr 21
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	1 00	July 21
Independence M Co	Nevada	John E Dixon	Stock Exchange	25	July 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	Apr 30
Standard Con M Co	California	W Willis	309 Montgomery st	50	Apr 12
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	30	May 27

870 Star	50@63c	540 Rustler	50c
1090 Summit	2½@2½	160 Real del Monte	1.30
100 Silver King	7½	450 Red Cloud	55@50c
650 S Standard	25@20c	365 Syndicate	7½@6½
465 S Bodie	35@40c	100 Star	65c
600 S Bulwer	1½	220 Summit	2½
90 Syndicate	7½	650 S Bulwer	80@85c
50 Tiptop	90c	900 S Bodie	30c
675 Tioga Con	5½@5½	675 Tioga Con	4½@4½
950 University	70@65c	650 University	60@70c
270 Vortex	80@70c	150 Vortex	60c
200 Wales	3½@3½	30 Wales	4

California Board—Latest Sales.

Wed'sday A.M., July 16.			
50 Alta	10½@10	100 Ætna (N)	6@5½
170 Ætna (N)	5½@5½	100 Almaden Q	1½
100 Atlantic	22½c	70 Belcher	5@5½
10 Alpha	25	70 Best & Belcher	17½@17½
100 Benton	6½	130 Caledonia	2 30
30 Belcher	5½	180 Chollar	7@7½
40 Best & Belcher	17½@17½	130 Challenge	2½
50 Bullion	6½@6½	70 Crown Point	5½
50 California	4.80@4.85	40 California	4.90
50 Con Virginia	4½@4.70	140 Con Virginia	4.80
300 Con Imperial	1.70@1½	300 Con Imperial	1.65
60 Crown Point	5@5½	50 Cons Cos	5c
50 Caledonia	2.10@2.05	200 Central	60c
300 Central	70c	70 Exchequer	6½@6½
70 Exchequer	6½@6.70	200 Enterprise	1.40
80 Gould & Curry	10½@10	60 Eureka Con	15@15½
50 Justice	3½@2½	40 Gould & Curry	10½
25 Lady Wash	1.95	100 Justice	5½@5½
50 Mexican	25@25½	50 Julia	3.60@3.65
100 Mint	10c	100 Kossuth	20c
500 North Carson	1c	70 Mexican	25½@25½
40 Ophir	35½@35½	100 Newark	12c
200 Orient	50c	275 Orient	50c@62½c
40 Sierra Nevada	41c@41½	30 Ophir	36½
300 S Utah	5c	70 Potosi	5c@5½
100 Tiger (W)	1½	100 Senator	25c
200 Twin Peaks	10c	500 S Utah	5c
30 Union Con	37c@37½	50 Sierra Nevada	42½@42½
60 Yellow Jacket	15c@15½	50 Savage	14½@14½
AFTERNOON SESSION.		200 Twin Peaks	10c
10 Alpha	26	40 Union Con	37½@37½
50 Alta	9½@9.70	150 Wales	3.55

Pacific Board—Latest Sales.

Wed'sday A.M., July 16.			
50 Alta	9½	20 Benton	6½
100 Belcher	5½	35 Con Virginia	4.80
100 Benton	6½	1200 Cresus	20@19c
875 Cameron	2.80@2.90	40 Challenge	2½
100 California	4.80	10 Exchequer	6½
200 Crown Point	5@5.05	50 Flowery	50c
40 Chollar	7½	365 Justice	5½@5½
140 Gould & Curry	10½@10½	10 Julia	3.65
20 Justice	5½	10 Lady Wash	1.85
690 Lady Wash	1.90@1.80	50 Mono	7½
180 Mexican	24½@24½	20 Mexican	25½
20 Noonday	9	20 McClinton	1.35
20 N Standard	21	50 N Bonanza	1.55
120 Ophir	34½@34½	140 N Noonday	2.70
350 Orient	50c	10 N Standard	36@34
50 Potosi	4.85	100 N Standard	24
20 S Nevada	41	10 N Con Virginia	9
220 Savage	13½@14	10 Ophir	35½
200 Yellow Jacket	15½@15½	50 Potosi	4.90
AFTERNOON SESSION.		200 S Bodie	40c
50 Andes	1.10	220 Tiger (B)	1.60
		300 Uncle Sam	1.05@1

The Mining Share Market.

To show the influence of manipulation upon mining stocks, we may say that the share market for the past week has been fair, notwithstanding the shower of assessments and the passing of the bonanza dividends. This is owing most undoubtedly to the absence or caution of a few individuals who have been accustomed to bear the market for their private interests. In reality it would seem as if the majority of investments were made without ordinary shrewdness and upon the dicta of irresponsible, irrepressible gutter brokers.

There is considerable reticence as to Comstocks generally. Should developments in the mines become better, stocks will respond as a matter of course. Water in the Sierra Nevada has occasioned weakness and greatly demoralized the Comstock market, and the heavy assessments that are called are not calculated to help matters. Over $2,000,000 are now in process of collection, a larger amount than was ever known in the history of the Comstock, and fresh levies will undoubtedly be made next week. The mines have overdrawn their bank accounts, and must have coin to make them good and to continue the work of development. All these causes are sufficient to ruin any ordinary market, and that it should be so well sustained shows well for the public faith in the future outcome of the mines. But faith without rich ore is of very little value, and the crash will soon come unless the developments now in progress should be very rich and extensive to make up for the millions of expense. The Union is a partial failure on the 2300 level, and the principal stockholders have thus far lost heavily.

The attempt to raise money on Bullion and Exchequer stock for the alleged purpose of beginning work on a new joint shaft has been characterized as an attempt to swindle shareholders out of at least $2,000,000. And it seems the assessments will be resisted until the affairs of the companies can be investigated. Altogether there is no inducement to invest in the Comstock mines, outside districts offering better opportunities. Bodie Con. is about to declare $1 per share. The slight rise in certain stocks during the week was caused by "chippers" capturing quantities of stocks, and selling at a small profit. It appears that there is more to be made, if people will invest, by selling at a small profit. It is not safe to hold anything, and the secret consists in "letting go." Very few listen to such advice, however, and, waiting for a big rise—get hitten by the fall.

The market is dull and irregular—easily affected by an ordinary demand, either rising or falling slightly, as there is a desire to buy or sell, and hence speculative ideas have very little room for expansion. In such a condition of things, mining share business might be said to be safe to a small extent.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

Items.—*Dispatch*, July 12: The work of retimbering the Moore mine is progressing finely, and they will be ready to take rock out again in about 10 days. In the lower drift of the Monterichard mine they have just struck richer rock than has yet been taken out. It is also well filled with an excellent quality of sulphurets. The ledge maintains its usual width of from two to three ft. Wm. Kirkendall has discovered a very rich quartz ledge at Starvation flat, which assays from $30 to $180 per ton. The ledge has been traced for a distance of about 1,300 ft. A third interest in the mine has been sold to a party of San Francisco capitalists, and machinery is to be put up at the mine forthwith. The Butte Basin mining company commenced active operations on their claim last Thursday at noon. The machinery is run by water power.

Bunker Hill.—Amador *Ledger*, July 12: Rich ore has been struck in the north drift of the 700 level. The ledge is 18 inches wide, and the rock is of splendid quality. The superintendent, John Palmer, presented us with specimens of the ore, full of rich-looking sulphurets, and sprinkled with free gold. The stopes are also producing well. The last clean-up gave an average yield of $16 per ton. Sinking operations are being prosecuted steadily. At present the shaft reaches 970 ft from the surface, and the intention is to push it to the depth of at least 1,000 ft. Twenty hands are employed about the mine and mill.

Govern.—The mill is kept running constantly, but the quartz has not the precious metal in cheering quantities. Sixty hands find employment about the mine and mill. The drift extending north toward the North Gover ground has passed small bodies of fair ore, and the indications are that a well-defined ledge is not far off.

Talisman.—The shaft is 800 ft deep, with an ore body two ft wide at the bottom. We understand the calculation is to go considerably deeper before starting to drift. The quartz met with at present is thought to be of a paying character. The mill is at a standstill, but will soon be set in motion when the ore has accumulated to give a fair prospect of steady running.

BUTTE.

New Quartz Mine.—*Mercury*, July 11: The McConnell and Durot quartz mining company started a 10-stamp mill at their mine, one-half mile northeast of Yankee hill, Monday of last week. After running four days, during which many stoppages were necessitated by reason of the machinery being new, the gentlemen cleaned up the plates, obtaining a 15-ounce bar of fine gold. As yet the batteries have not been cleaned. The ledge is two ft thick at the surface and five ft in thickness at the 120 level. They have 130 tons of ore delivered at the mill, the average of the same, judging from past working, is estimated at $22 per ton. Commencing work on the property in 1877, the company have been to considerable expense in getting ready to extract the precious metal, and now are glad to know that their prospects of reward are so promising.

MARIPOSA.

Items.—*Gazette*, July 12: Mr. J. D. Henwood, who returned on Thursday last, informs us that the new mining shaft which was commenced 21 months ago at the Washington mine is down 1170 ft. Thirty ft more will bring them to the 1200 level, where drifting each way from the shaft will commence. It is said there is a large body of paying ore, which this new shaft will operate upon as soon as the object point is reached.

MONO.

The Explosion.—Bodie *Standard*, July 11: A visit to the hill this morning found all life and bustle among a large party busily engaged in clearing away the debris. Where the magazine was situated, a gaping pit about 30 ft in diameter alone remained. Nearly opposite, but a few yards, was the wreck of the old Standard hoisting works, where nothing remained but slivers and the boiler and engine. The machinery was badly stripped of all its minor parts, but stood intact on its foundation. Fortunately the shaft did not catch fire, and the men in the mine were perfectly secure. They were ignorant of what had transpired above, and had anything occurred to the shaft there was an easy escape through the Standard Con.

Item.—Bodie *Standard*, July 14: The explosion only temporarily suspended work at the Standard incline shaft and the Summit. The engines are already in order.

Standard Con.—The north drift from the east crosscut, 385 level, has been extended seven ft; total length, 272 ft. They are taking out about four ft of ore on the footwall; the ledge is supposed to be between 15 and 20 ft. The ore is good. The upraise on this ledge is up 215 ft. The ledge is about 15 ft wide of very fine ore. In the stopes the ledge is from 8 to 15 ft wide. The west crosscut from the south drift, 450 level, is in 95 ft in good running ground. In the West Standard the ledge in the stopes, 550 level, is about eight ft wide, of good ore.

Summit.—The north drift, 200 level, has been advanced during the week, six ft; total length, 286 ft. The ledge is two ft wide; the wall rock is very hard. The east crosscut from this drift is in 163 ft; progress for the week, seven ft. The north drift 300 level, is in 144 ft; progress for the week, 10 ft. The ledge is two and a half ft wide, and looks well. The south drift, same level, has been run since last report, 18 ft; total lentb, 133 ft. The ledge is three ft wide.

South Noonday.—At present work is being done in the incline sink on the vein, which has attained a depth of 70 ft. In the bottom the ledge is two and one-half ft wide, and the ore is of very good grade, assaying from $40 to $90 per ton. In a few days a double compartment shaft will be commenced and machinery put in sufficient to sink it to the depth of 1,200 ft.

NEVADA.

Items.—*Foothill Tidings*, July 12: The product of the Idaho mine for June—five weeks—was $68,000, and on Monday a regular monthly dividend was declared, payable immediately, of $7.50 per share, amounting to $23,250. This is the 110th dividend, which makes the total of dividends paid by the mine $2,681,800, out of a product of $5,528,659. The bottom or No. 11 drift (1,180 ft from surface) has been run east from the new winze 40 ft, upon a four-ft ledge, that continues to improve in quality and shows well in free gold. The 10th level, east of the winze, is in 500 ft, having been driven 20 ft during the past month, carrying a strong four-ft ledge of high-grade ore. Very rich gravel has been struck in the Nevada and Golden Gate hydraulic mine, at Sucker flat, just out of this county, near Smartsville. The small portion of ground already washed has proven exceedingly rich, the amount taken out aggregating nearly or quite $900,000. Rocky Bar is employing 42 men. The ledge in the new shaft continues the usual size, of from 12 to 15 inches of good milling ore, a clean-up of 00 loads of which was made a few days ago, at Sothern's mill, which amounted to $3,300, or about $37 per load, without counting sulphurets. The main shaft of New York Hill is down over 1,000 ft and going on down. A crushing of 100 loads of rock is now being put through the Omaha mill. The previous crushing of 200 tons paid about $50 per ton. The Shamrock mine below Forest springs has purchased the Homeward Bound machinery and started up this week with good prospects. A bar of gold, valued at $1,100, and taken from the Canyon Creek mining region near Washington, was brought to Nevada City this week.

Items.—Grass Valley *Union*, July 12: On Wednesday last, Oscar White, agent of the Giant Powder company, exploded with electric battery, 330 cases of Judson powder, equal to eight and one-fourth tons, in the Bird's-eye Creek gravel claim, at You Bet, of which George S. Powers is Superintendent. To make this blast, the main drift was run into the face of the bank (which is 200 ft in hight) 59 ft from the end of which a T drift was run in one direction 82 ft, and in the opposite 69 ft, and the cases of powder placed therein, and the mouth of the main drift then securely tamped. The blast was a splendid success, the bank being heaved and thrown 50 ft back of the powder line, and from 60,000 to 70,000 cubic yards of ground shaken up for easy washing. Under the big head of water which is used by the company this will be washed away in from four to six weeks.

TUOLUMNE.

Items.—*Independent*, July 12: Nate Arnold, of Yankee hill, struck a big pocket in Clark's gulch, near Five Mile creek, this week, working alone on a pocket vein. He obtained between $4,000 and $5,000. Another rich strike in quartz was made last week at Whitman's pass (near Kennedy's), above Yankee hill, by Judge Keyser and William Gilbert. The party have taken out about four tons, and specimens brought to town are very rich. Considerable excitement existed, so much so that a number of new claims have been staked off. C. C. Carter has discovered something good in quartz on the divide between Dumbacher's and J. L. Haslam's. Following up the rich float he got the vein, which, from indications, will prove to be a first-class bonanza.

The Mount Jefferson.—This company have recently struck a large body of ore in their 160 level, near the foot of the old Burns' shaft, which appears to be the continuation of the Burns' chute that was supposed by many to have been worked out many years ago. This company is now running its 10-stamp mill every day on good ore.

NEVADA.

WASHOE DISTRICT.

Con. Virginia.—Gold Hill *News*, July 15: There have been extracted the past week 794 tons of ore. On the 850 level the joint California west crosscut has been extended 28 ft; total length, 443 ft. It still continues in vein matter, showing some quartz. On the 1500 level the south drift is now in 148 ft, passing through a favorable-looking vein formation. On the 1750 level connection has been made with the tank above the 1650 level of the O and C shaft and the main line of water pipe leading to the Sutro tunnel. On the 2150 level the south drift is now in 262 ft, still showing a favorable-looking vein formation.

Con. Imperial.—The 2000 drift has been advanced 32 ft; face in hard blasting porphyry. Old north drift, 2000 level, being cleared out. Smoke and gas have accumulated; water is being drained off by means of syphons. Connection with Crown Point has been made.

Gould & Curry.—The foundation for the hoisting engine is completed, and good progress is being made in sinking the pit for the pumping machinery. The joint east crosscut on the 1700 level is now in a distance of 1,000 ft from the main lateral drift.

Belcher.—The north incline has been sunk a depth of 122 ft below the 2700 level, 21 ft having been added during the week. The south crosscut on the 2700 level is in 103 ft, having made 20 ft the past five days. This crosscut is stopped for the present. The north drift on the 2700 level is now in 162 ft, 38 ft having been added during the week.

Trojan.—Northeast drift, third station, has been advanced 20 ft, through bright, lively-looking quartz giving low assays. From east crosscut, at 448 ft from shaft, have made upraise 20 ft, through quartz assaying from $7 to $12 per ton. North drift from upraise, second station, has been advanced seven ft, and from the same have made crosscut to the west 30 ft, through quartz and porphyry; face of drift in quartz giving low assays.

California.—There has been 675 tons of ore extracted the past week. On the 850 level the joint Con. Virginia crosscut has been extended 28 ft.

Union Con.—North drift of 2000 level is within 15 ft of the Union shaft.

Sierra Nevada.—Temperature of water on 2200 level is 138°. The quantity has decreased, but not enough to resume work on ore stopes.

BELMONT DISTRICT.

Belmont.—*Courier*, July 12: The portions of the mine now prospecting are without change. The raise from the 300 level has been advanced 37 ft in a formation of vein matter and quartz three and one-half ft thick. In crosscut west from 400 level they cut through the vein which is showing some fine ore, and of the same character as that in the ore body below the 300 level; now drifting north under the vein. The crosscut west from winze was advanced 10 ft in very favorable vein matter.

Alexander.—The Alexander mining company shipped, on the 3d of July, bullion valued at $5,146.27.

ESMERALDA DISTRICT.

Wellington Mines.—Esmeralda *Herald*, July 12: The location of this new mining district is in Douglas county, about two and one-half miles from Wellington station. The original owners have incorporated as the Wellington Gold and Silver mining company; making Virginia City the principal place of business. It is the intention to commence the erection of a 10-stamp mill at an early date, and prosecute work with vigor on the mine of the company. The property has been opened by a shaft run down 100 ft, and by a tunnel run in now 70 ft on the vein. The ledge is two and one-half ft in width, and carries rock having an average assay of $70 to the ton, about 5% of which is silver. There are now 200 tons of good milling rock on the dump ready for the mill, and enough can be extracted, as needed, to run the stamps indefinitely. We are assured that Wellington district shows great evidences of permanency, the ledges bearing a north and south course, cropping out boldly for a long distance.

ALASKA.

Items.—The latest mining news, per steamer from Alaska, is to the effect that the Alaska Gold and Silver mining company's mill, 15 miles from Sitka, is now in successful operation. The ore averages $30 a ton, is easily melted, and though the shaft is but 80 ft down, the ledge is well defined and is daily growing richer and more extensive. The first bar of gold from Alaska will be shipped next month. There are many discoveries of new ledges, and great energy is displayed in prospecting around Sitka. A mining district was established last month and N. Haley elected Recorder. Miners arriving from below find ready work.

ARIZONA.

Globe City.—*Silver Belt*: The combination tunnel, run to tap the ledge of the Golden Gate and Golden Star, has reached a distance of 175 ft, cutting a small vein, of two ft in width, 100 ft below the surface that shows free gold in almost every pound of rock taken out. A distance of about 20 ft more will reach the main ledge at a depth of 120 ft, then the respective parties will drift each way to develop the ledge, and take out ore for milling. This seems to be the mother lode of this district, and is located for a length of 10,500 ft, every claim is partially prospected and shows well. The Gold Hill mine is the first north extension of the Star; has a 30-ft shaft with a well-defined ledge, assaying satisfactorily to its owners. A new strike of excellent ore in the El Capitan is reported. The Stonewall mill, five stamps, is turning out about $1,000 in silver bullion per day. The Milwaukee mine, a new location by C. W. Felter, is opening up big. In the main shaft the ledge is three and a half ft wide and full of chloride. We learn from Dr. Thatcher, who has been on a visit to the Independence mine, that the bottom of the shaft, at a depth of 150 ft, is in quartz containing malleable silver. The roasters for the Isabella mill was expected to arrive at Casa Grande on the 23d, and would be immediately loaded on wagons for this place. The shaft of the S. W. Alice is in good ore at a depth of 75 ft. The assays show gold as well as silver. Dr. Thatcher has let another contract on the mine.

COLORADO.

Items.—Denver *Tribune*, July 9: The Neath mine, on Covode mountain, has been idle for a number of years, and now work has been resumed. It is located about half way between Swansea and Empire, and is owned by John M. Dumont and the Vivian brothers. An adit, which is now being pushed ahead by a double shift, has been driven 110 ft on the lode, at a level of but a few ft above the creek, which has exposed a very fine vein of copper ore, rich in gold. The pay streak is several ft in thickness, in places the ore being scattered in bunches and small particles, and at other points there being a solid vein, which at one point is 21 inches thick. Copper pyrites is the predominating ore, with considerable gray copper accompanying it. The ore mills five ounces and upwards in gold per ton. The new shaft on the late discovery of the Ben Franklin, Rosita, is down 50 ft, and has been connected with the old shaft by a crosscut. The lead shows quite a quantity of high-grade ore, and grows better with development. The Magnie tunnel, on the Little Minnie lode, Rosita, is now 140 ft into the hill.

IDAHO.

Items.—Idaho City *World*, July 11: Messrs. Jud. Boyakin and George Dunnigan have discovered a quartz mine on Slater creek, about a mile from the Harris road, in this county, that assays $62 in silver and $2.50 in gold per ton. The Sub Rosa mill has been started up on good ore. The mine looks splendid. The drifts show that the mine is more extensive than had been supposed, and the ore exceedingly rich. By sinking, other chutes have been discovered, with indications that they will continue to increase in richness with depth.

Bonanza City.—*Idaho Statesman*, July 12: A 20-stamp mill is at Challis ready to go in as soon as the road is finished. Capt. D. B. Varney & Co. commenced this week to sink a shaft on the Montana mine. Norton is running a double-bedded arastra on rich ore from the Norton mine. Large numbers of men have left Bonanza City to prospect the surrounding country.

MONTANA.

Butte Items.—*Miner*, July 8: Mr. Sloss, of Sloss & Hammond, Silver Lake district, brought in 88 pounds of fine bullion, the first clean-up for the season of their arastra working on Alturas ore. Messrs. Sloss & Hammond have been at work all winter developing their Silver Lake claims. At our last report the Alturas was 00 ft deep, at which depth the lode was five ft wide; but at present, at the foot of the 140-ft shaft, the lode is found to be a little over eight ft average width. The Alturas is a contract vein, running northeast and southwest. From the bottom of the 140-ft shaft a level has lately been started toward the northeast, further to develop what has every appearance of being a most valuable mine. Mr. Patrick Nolan, who lately bought W. B. Hull's lease on the North Star, has commenced stoping from the western level. He has already something over 500 tons of ore on the dump. Nearly a ton and a half of fine bullion was shipped from Butte last week. At this rate the shipments of 11 weeks would about equal in value a ton of pure gold.

NEW MEXICO.

Items.—The chlorides and bromides of silver taken out in the Chloride District return an average of 70 ounces per ton. The mine has 13 shafts, around which are dumped hundreds of tons of rich ore.

NEW ZEALAND.

Items.—Thames *Advertiser*, July 21: In the Red Queen, Johnstons and party have crushed a parcel of about 12 tons of general dirt, for the excellent return of 14 ounces 10 pennyweights of melted gold. At Coromandel the Union Beach lodged 21 ounces of gold from five tons of quartz. At Preece's point a find of rich gold has been obtained. The Pride of Tokatea is getting very rich stuff from the new leader. In the Alburnia the stopes west of No. 4 winze are yielding good crushing ore. On the seaward side of the Moanatalari mine the lode on the No. 0 reef is two and one-half ft thick, and heavily charged with mineral and iron pyrites. The lode on the 80 level, on No. 3 reef, is one ft thick of paying stuff. There is a growing impatience for dividends in the leading mines, and desperation possesses the mine managers.

OREGON.

Items.—Jacksonville *Times*, July 11: Thornton, Kincaid & Co. are doing well on Silver creek. They have picked up nuggets weighing $80 and $47, besides several smaller pieces. W. A. Johnson, an experienced miner, is opening a quartz claim in Josephine county and expects to commence crushing ore about the 1st of September. A partial clean-up was made the other day at the diggings of Kubil & Bolt, on Farris' gulch, which proved quite satisfactory. Several nuggets of quartz containing a large proportion of gold were picked up. Operations have been resumed and will be continued for several weeks yet. J. T. Layton, mining on Farris' gulch, made another clean-up a few days since, after a three weeks' run, which yielded 100 ounces of gold, or about $1,050. Recent reports leave the impression that the richness of the Briggs' Creek mines has been exaggerated. The Silver Creek country promises better, as several good claims have been opened. Beck Bros., on Big Applegate, recently completed a ditch over two miles in length, and are engaged in ground sluicing. They expect to employ more scientific methods as they open their claim.

UTAH.

Bingham.—Salt Lake *Tribune*, July 13: These mines are the West Mountain mining district, a sort of mining suburb to the mining city of Salt Lake. There has been but little work done on this group of claims, except what is necessary to keep the titles good, but there is no point in the district where the surface indications are more promising. The country rock is penetrated in various directions by porphyry dikes, and the metal-bearing lodes are, in most cases, true contact lodes between porphyry and quartzite. These facts give promise of large veins of good ore, as well as permanency to the depth. In the Stuart, Stuart No. 2, Edison, Sunset and Bonham, extensive explorations made during the last eight months have exposed what may, without exaggeration, be denominated a mountain of gold ore; running from 20 to 300 ft in width, sufficient in sight to employ 200 stamps continuously for from one to two years, with a fair prospect of huge reserves of mineral yet uncovered.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Martin White, July 9th, $5,995.57; Northern Belle, July 9th, $2,409.40; Eagle, July 9th, $1,380; Con. Virginia, July 12th, $25,492.37; Bodie, July 13th, $11,700; Tiger, July 13th, $17,000; Belle Isle, July 14th, $39,000; Independence, July 14th, $19,300; Eagle, July 9th, $1,380; California, July 12th, $46,658.39; Independence, July 14th, $19,300; Alexander, July 10th, $5,700; Indian Queen, July 7th, $4,551.16; Northern Belle, July 7th, $2,734.46; Standard, July 8th, $40,795.04; Northern Belle, July 12th, $4,397.84; Christy, July 14th, $5,383; Hillside, July 16th, $4,000; Martin White, July 13th, $9,780.34.

Great Britain is not the wealthiest country on earth as has been supposed. Late estimates show that France is worth $2,085,600,000 *more* than Great Britain.

The cost to Russia of the war with Turkey amounted to £150,000,000, and the deaths in the Russian army numbered 200,000.

The Claims of Zoology.

[Read by W. N. Lockington before the San Francisco Academy of Sciences, Monday, December 2d, 1878.]

In accordance with the constitution of this Academy, a "Zoological Section," composed of members specially interested in zoology, has been formed, and as we wish to gain the earnest support of all thinking men and women, I take the opportunity this evening to urge upon the members of this Academy, and through them upon the public generally the importance of this science, the science of animal life, to all of us who live and move and breathe in this beautiful world; for a beautiful world it is, in spite of the struggle we have to maintain life, in spite of human defects and passions, and in spite of all the dismal creeds that are the legitimate offspring of human spite and passions.

If the noblest study of mankind is man, then the noblest science must be that which includes man, must be zoology; the science of animal life; the science which tells us of our relationship with other organisms; which throws light upon the intricate workings of our complex structure by comparison of them with simpler structures, beginning with the lowest Protozoan that takes in nourishment without mouth or limbs or definite structure, passing upwards through all the varied range of hundreds of thousands of animal forms, and culminating at last in an intimate knowledge of that powerful and intelligent species which has obtained the mastery of so many of the powers of Nature, that it has the power for good or evil, of altering in many cases what would otherwise be the course of events.

Zoology is not, as many appear to think it, a mere dry science of technical names and descriptions; but is, to all those who can draw conclusions, to all whose eyes can take in a wide prospect, a beautiful and a poetical science, beautiful with the beauty of Truth, and poetical from its human interest, for it appeals directly to the sympathies and senses of mankind, and it is in such an appeal that the essence of all true poetry lies.

At the outset, it is true there is in this, as in every other subject worth knowing, a formidable array of technicalities to master. Each of all the countless forms of animal life must be docketed with a name, and a description must be written to enable others to identify the form when they find it. This is the first thing to be done, and without it our further progress would be stopped. Before we can build our mansion, we must be able to distinguish our materials otherwise we cannot arrange them in their places. But those who do this work, useful though it is, are but the hewers of wood and drawers of water to those who come after, unless theyalso can do higher work.

The whole of nature forms one grand design; it matters not, for our argument this evening, whether a supreme architect thought out that plan and superintends its execution, or whether the terms Nature and Universe being understood to include whatever has existence, the architect must himself be included in the design—in both cases the design is undeniable, and he who can most clearly see the proper place and real purport of the portions that come within his ken, is the really intelligent artificer, whether as a geologist, mineralogist or chemist, he works among inorganic substances; as a botanist or zoologist, he deals with life in its varied manifestations; or as an astronomer, his mind grasps the relations of worlds and systems.

The higher work, then, of zoology, consists in the knowledge of the structure and affinities of animals; of their place in the scale of nature; of their value in the economy of the world, of their relations to ourselves and to each other.

But for the proper accomplishment of this higher work another class of facts, different altogether from the mere docketing and describing of species, and of much more general interest, must be brought together.

The whole life-history of every creature must be studied from its first inception through all the stages of its growth in the egg, or within the body of its parent; through all the vicissitudes of its youth to adult age, and onward still to its inevitable decay and death; its environment, its food, the influence upon it of climate, of its enemies, of its rivals and of its friends, must be taken into account, and it will then be found that every creature, as we see it, is the result of a delicate adjustment between internal and external forces; between the hereditary tendencies of the stock from which it sprung, which tendencies are themselves the result of the environment of its ancestors, and the special influences brought to bear upon it during its own more or less brief existence.

Special conditions cause new forms to arise, this we see around us every day in our domestic animals, but to these variations which man himself has helped to bring about, or the causes of which we can clearly perceive, we give the names of breeds, races, or varieties; while to those the date and manner of whose origin is unknown to us, we give the name of species. For aught we know, some of the species found in a state of nature may be as recent as some of the races of our domestic animals, and a long-established race or variety is clearly on the road to be a species, and will become one, if it is well-adapted to its environment.

To the class of facts I have just mentioned every earnest man, woman, ay, child old enough for school, may become a contributor.

Every human being who has eyes, and knows how to intelligently use them, who has a brain to think upon what he sees, and who will take the trouble to jot down on paper every interesting fact he comes across, instead of trusting to memory, which is treacherous in the best of us, can aid in this work; and this is the aid which I venture to ask from all present, whether they are professional students of zoology or not; whether they join our section, or choose to remain outside.

Here then we have two classes of facts; on the one hand some individuals of a species have been technically described so that it may be identified; on the other, we have numerous isolated notes upon the localities frequented by it, the food it eats, the changes it undergoes through life, or to adapt itself to its surroundings, and upon its social habits.

At this point commences the higher, more difficult, but more interesting work, namely, to bring together these scattered facts so as to form a complete life-history, filling up the gaps in the record by systematic investigation, verifying, wherever possible, previous facts by repeated observation, and noting its varied relationships to other forms already known. In accomplishing this we are met with many practical difficulties, one of the greatest of which is the want of harmony and mutual appreciation that exists between those whose daily life is spent out of doors, and who have the best opportunities for the study of the habits, food and distribution of animals, and those who, confined in the city, but with abundant opportunities of studying recently killed or preserved specimens, take upon themselves the labor of describing and classifying. The former class require a more extended knowledge of animal life than is afforded by the narrow range of their daily life. To them, a robin is a robin, a woodcock a woodcock, every elongated fish an eel; they cannot perceive, until they really study the subject, that the same vernacular names are given to different animals in different localities, and that most animals have no name at all in the vernacular.

When an enthusiastic but uninstructed observer of this class brings his observations to a professed student of zoology, he is apt to be offended when he finds that he either cannot make his interlocutor understand what animal he is talking about, or that his so-called eel is a lamprey, his "pike" a kind of carp, and his robin a relation of the thrash. The museum zoologist, on the other hand, though often unable to obtain from his own observation, facts of distribution, habits, etc., is too often discouraging and unsympathetic in his remarks to those who really, as far as their knowledge allowed, were accurate observers.

To bring together these two classes is one of the principal objects of this section. It is our hope to include among our number many ladies and gentlemen who have facilities for collecting and for observing the habits of animals not found alive on this little peninsula; to impart to them such information respecting what is done and what is not done, as shall prepare them to observe and to collect with method, and gradually to raise up a school of field naturalists, with eyes that can see intelligently.

It is also our hope to find, more especially among younger members, some who will take hold of some neglected branch, and make it their own, studying it in the field and in the cabinet; and it is our hope to be able, with the help of such workers, to arrive ere long at something like a general knowledge of at least the distribution, food, habits, and main peculiarities of external and internal structure of the animals, terrestrial, fresh-water and marine, of the Pacific slope of North America.

In as few words as possible I will endeavor to show you how little has yet been done toward this result, and to point out a few of the benefits to the human species that would result from a systematic study of our fauna.

The departments that have, not only on this coast, but in most parts of the world, received the greatest share of attention, have been the mammalia, our nearest relatives among the lower animals; the birds, to which men have ever been attracted by the beauty of some, the sweet notes of others, and the constant presence near us of many; the insects, interesting at once from their numbers, their varied colors, and their influence, in many cases injurious, upon us; and the mollusca, or at least their shells, which are so conspicuous and comparatively so easy to collect.

In all these departments most of the preliminary work has been done, the species have almost all been named and described, and their classification and relationships are tolerably defined. But how much remains to be known before we can say that we are possessed of the life-history of most of even these best known forms! Take even the mammalia, best known and fewest in species (on this coast) of all the groups. How many an interesting chapter might yet be written on the habits, distribution and food of the seals, dolphins and whales! The first two destroy our fish; is it not worth while to study their habits, that measures may be taken to check the too abundant increase of those species which are not in themselves useful to mankind? The fur seals are becoming scarcer; the elephant seal, once extensively taken for its oil, is almost extinct; the whale-fishery is often a failure. Would not a better knowledge of these creatures, disseminated among the classes who hunt and kill them, enable us to preserve them and even allow of their increase? Our rodents, many of them, from their inordinate increase, call for study from an economic point of view.

Were the life-history of every injurious beetle and butterfly fully known, the amount of damage they work to our crops of fruit and grain could be greatly lessened, and even put an end to. So great have been the devastations of some of these insect enemies, which most decidedly were never made for our pleasure, but for their own, that some of the interior States have appointed commissions to find out a remedy. But this State has done nothing, though the locusts are sufficiently destructive, though various larvæ destroy our apples and oranges, though aphides swarm on our vegetables, and even the dreaded phylloxera is attacking our vines.

Which of our native birds should most be fostered, for it is to our friends, the little birds, that we must look for aid against our countless insect enemies?

Our mollusks are good for something more than a place in the museum. Most of them are good for food, and very few of us have any notion of the countless numbers of individuals of some of the species of "clams," as every bivalve that is not an oyster or a mussel is commonly called, and of the extensive use that might be made of them for food.

The mollusca, moreover, form a large part of the food of many birds and fishes, and in this way also come into relation with our daily life.

The reptiles of this state are probably all described, although their habits require much elucidation; and the same may be said of the Batrachia, or frogs and salamanders. The curious metamorphoses through which this latter class pass are well known in a general manner, but no one has yet followed out the development of any of our Californian species, giving the date and duration of each step in the change from an aquatic to a terrestrial life.

Among the fishes doubtless many forms yet remain to be discovered; in fact, several have appeared in the markets this year that were not previously noticed. Here is a wide field of investigation, the time of spawning, the habits of the young; the laws which regulate the coming and going of our fishes, their comparative abundance at one season and their scarcity at another; their food, their favorite haunts, their range of variation, are in very few cases known; and as all these facts have a direct bearing on the supply of food for human use, they need prompt and full investigation.

Needful it is also to study their environment, so as to keep down their enemies, and to cultivate in bays, harbors and rivers those conditions of the water and of the bottom which are beneficial to them.

Probably the greater number of the higher crustacea (the *Decapoda*) have been described, but many species might be advantageously used as food which are now passed by as useless.

Among the lower crustacea little has been done; there are more unknown than known species, and probably most people would consider such small organisms as beneath the notice of practical men; yet these small creatures form a large part of the food of our fishes, and one of them, the *Limnoria*, comes boldly into notice as a wholesale destroyer of wharves and quays, biting the wood into dust, till the whole fabric crumbles. Who knows anything about our spiders? Few people probably, in this State. There lives in Sweden a man who could probably tell us more of the structure and habits of our spiders than any of us know.

Under the common name of "Vermes" or worms, are grouped numerous classes of animals having little resemblance to each other, but incapable of being classed with Vertebrates, Mollusca or Arthropoda. Some of these groups appear to form the starting points from which one or other of the higher sub-kingdoms may very possibly have been derived.

Some of them inhabit the ocean, roaming free or building for themselves curiously-formed tubes; others live in fresh water or in damp places in the ground, and yet others find their proper dwelling inside of some animal, in the intestinal canal, in the muscles, even in the brain. These internal worms often inhabit two or three different animals at different stages of their life; passing from a herbivorous creature to the carnivorous animal that devours it; or they lurk in the water, ready to develop within the unfortunate mammal or bird that drinks it; and many of these forms are proper parasites of man, while others live when by accident transferred to him.

Who can say, therefore, that the worms, some of which foreshadow higher forms, and others torment and even kill our domestic animals, while others do not spare man himself, are not worthy of study?

But I must draw towards a conclusion, and can only mention the echinoderms, or sea-urchins, star fishes, crinoids, etc.; interesting on account of their peculiarities of form and structure, some used as food by certain nationalities; and many, now no longer living, forming with their dead bodies an important portion of the rocky crust of our globe; and the cœlenterata, or corals and jelly fishes, the lowest animal forms possessed of definite tissues, creatures consisting of nothing but stomach, skin and feelers, with sometimes the first rudiments of eyes and nerves, yet possessed of marvelous beauty, and building, some of them, those massive coral reefs, monuments of buried islands, which put to shame the noblest structures raised by man.

Below all these lie the countless forms of the Porifera or sponges and the Protozoa, or one-celled organisms, the Foraminifera that, though but structureless jelly, form wondrous shells which help to build up the strata of our earth; the Radiolarians with their network of glassy needles, and the Infusoria that swarm in the waters of every clime.

In view of all this, who can think of zoology as a dry science, who in his senses can think it a useless one?

Above all other problems in interest to a living being, is the problem of life, and it is by the intelligent study of life alone that the slightest light can be thrown upon this, the most difficult of all problems. For thousands of years men have been trying to reason out the nature of things by *a priori* argument, forming theories and creeds of more or less plausibility, without ever referring to the real Book of Life, the Universe itself.

This book of life is no closed book, no locked and guarded secret like the pretty secrets of suspicious or dangerous men, but an open volume written in large lettering, for all to read who have the will; but man has for ages placed his foot upon this sacred volume, and, despising its contents, because in his mistaken vanity he has believed himself to be higher and nobler than anything it contained, has looked for information from unknown realms, of whose very existence he has no certain knowledge, and can at most only say, "They may exist," or "I trust they may exist."

The Eclipse of 1880.

California, amidst all of its golden blessings, is to receive the full benefit of the grand total eclipse of the sun which will occur on the 11th of January next. All of its sublimity is to be bestowed upon our State, and this fact may excite the laudable jealousy of other States to provide a similar exhibition in the near future. The field is open and the moon and sun not controlled by any human monopoly. Scientific men and amateurs are already making preparations to visit us, and we should be prepared to receive them, with moderation as to pecuniary expectations. State character is as good and valuable as individual character, and besides the world at large holds to the doctrine of Montesquieu, that when the State possesses a bad disposition it is because the people who compose it are wrongly disposed.

Inyo county lies almost exactly upon the central line of totality, and this county, as shown by the *Independent*, offers advantages unexcelled by any other county in this State or any other kingdom. First, clouds, even in winter, especially in January, rarely obscure the heavens; and, second, we have the highest and yet most accessible peaks (and many of them) in the United States. The highest of them is Mount Whitney, 15,200 feet above the sea level, to the very top of which observers can ride on horseback—barring an accidental snow storm to prevent. But in any event, the snow-belt is never but a few miles in width at any time, since it is but a few miles from the mountain summit to the valley, where snow never, or "hardly ever," falls. There are dozens of other peaks in sight, some much easier of access, and several nearly as tall as Mount Whitney. But in view of the risks of clouds on the high Sierras, the surest place for good observation is from the summit of the Inyo range, say 20 miles eastward of the high peaks of the Sierras, therefore not far enough from the central line of totality to be of consequence. The towns of Darwin and Cerro Gordo, and the Indian Queen mill, a hundred miles to the northward, are all in this range, and all well suited for points of observation. There are fewer cloudy days or hours to intercept a heavenly view from that range than from any other in this State. Its peaks reach an altitude of about 9,000 feet. The atmosphere on this range is, as before intimated, almost universally perfectly clear, even when the summits of the Sierras, but a few miles distant and the lands west thereof, are all buried in haze or clouds.

Of course San Francisco would be the rendezvous for all parties, and other localities selected. So let us be prepared to do our share in the scientific features accompanying a total eclipse. Scientific men of this State are acquiring a world-wide reputation, and they should maintain it. We have capital, and to spare, for improvements, and more of it might be devoted to scientific pursuits with profit to the capitalist and benefit to humanity.

A Buried Forest.—It has been recently discovered that an oak forest lies buried in the valley of the Fulda, near Rosenburg, Hesse Cassel, Germany, at a depth of from six to nine feet below the surface. The wood flourished at a very remote period. The greater number of the trees discovered were in good preservation; but, owing to the action of the water through innumbered ages, they have become thoroughly black in color; they have also become very hard and close, so that they would be good material for carving and ornamental cabinet work. Some of the trees are of great size; one taken out of a gravelly portion of the bed opposite the village of Baumbach, and since sent to the Geological Museum at Berlin, was 59 feet long, nearly five feet in diameter near the root, and about 38 inches at the top. Even larger specimens have been found. It is reported that the furniture and fittings of the Geological Museum at Marburg are to be made from this long buried timber. It is not yet decided whether these buried oaks belong to a species still existing or to an extinct one.

Every adult man has 1,400 square feet of lungs; rather, the mucous membrane lining the air cells of his lungs, if spread upon a smooth, plain surface, would cover an extent of 1,400 square feet.

The Engineer.

The Railway of the Future.

Comparatively novel methods for improving railway operations in various ways, appear to be under serious consideration. One of these directions was probably indicated in a speech delivered by Mr. Edmund Smith, one of the vice-presidents of the Pennsylvania railroad, at a banquet given by the Wholesale Grocers' Association of Philadelphia in Long Branch a few weeks ago. After referring to the marked improvements which have resulted from the introduction of steel rails and the increase of the load of freight cars from one ton per wheel to five tons, he said: "Shall we go on to improve and develop the system in the future as in the past? There is no reason why we should not. I venture the opinion that the day is not far distant when our main lines of railway will be illuminated at night by the electric light, and other and greater improvements will keep pace with the spirit of the age."

The same subject was discussed more at length in a paper recently contributed by Sir Edward Watkin to the London *Times*. He suggests that there "is no reason why the railway machine should not be so improved as to far more than double the industrial forces." To promote this result he advocates a great increase of the rate of speed of all passenger and freight trains, accompanied with facilities which would enable any passenger "who chooses, to utilize undisturbed the flying hours of the accelerated railway train." He estimates the time now consumed by the English traveling public in railway journeys at 200,000,000 hours, which, at the low rate of sixpence per hour, is worth £5,000,000, or the capitalized sum of £125,000,000, and he contends that appliances might be devised which would enable many travelers to use advantageously time that is now lost. He also suggests "the use of stations for purposes of business, of deposit, of merchandise, and of banking." He also strongly advocates a great increase in the average rates of speed, contending that "if one train can go 60 miles an hour with given loads others can do the same."

Sir Edward declares that what is wanted is, equality of speed and the means of passing stations of second importance instead of stopping at them. As regards any railway with traffic enough in costly regions of property we could establish, if need be, a second story. The former is a question of the equalization of the power of the engine and of the provision of a kind of carriage for goods, minerals, and cattle which could safely run at maximum velocity. The essentials of this latter are the best material, proper springs, oil-boxes, spring-buffers, four-feet or four-feet-six-inch wheels. The railway loader would have to learn his business of storage for speed. The increase and equalization of speed would double the time-saving at present affected by railways, and then let me ask the reader to realize the new power of production, the new power of competition, the new lengthening of life resulting."

An Old Engine.—A venerable relic of past engineering skill has been presented by the Earl of Lonsdale to the Patent Office Museum, South Kensington. This is a specimen of Heslop's winding and pumping engine, a patent for which, numbered 1,760, was taken out in the year 1790. Heslop's engine, one of the immediate predecessors of James Watts' invention, was considered in the days of our great grandfathers to be an almost perfect machine, being superior to the atmospheric engine of Newcomen, even as improved by Smeaton. The present engine has been at work in the neighborhood of Whitehaven for 73 years, having been erected at Kell's pit for raising coal about 1795, afterwards removed to Castlerigg pit, and thence to Wreath pit in 1837. At the latter place it not only lifted coal out of the mine, but worked a pump till last summer, when it was brought to London. The engine now at South Kensington is the last survivor of its race.

Japanese Industries.—Deposits of petroleum have long been known to exist in Japan, but they were not, until recently, utilized, that people not being able to refine it. Having learned how to prepare it for burning, they have gone extensively into the business and will now be likely to make enough for their own use, thereby somewhat restricting the outlet for the American article. They have also started in to work their gold, silver, and copper mines, which for ages had been much neglected, though they are quite numerous and with the aid of improved machinery and methods can probably be worked with profit.

Test for Mercurial Vapors.—M. Merget recommends paper steeped in the ammonical solution of nitrate of silver, or in chloride of palladium, as reagents for mercurial vapors much more sensitive than gold foil. This test paper is very sensitive; a slip of sheet-copper plunged into a liquid containing one part of mercury in 10,000 remained bright after immersion, but if exposed to the ammoniacal nitrate of silver paper it occasioned a characteristic black spot.

The explosion of giant powder at Bodie was not perceived by the miners below ground, although the effect was tremendous on the surface.

Useful Information.

Can a Steam Pipe Set Fire to Wood?—At the Crescent Steel Works in this city, a steam pipe two and one-half inches in diameter, carrying 90 to 100 pounds pressure, was laid underground about three years ago, encased in common pine boards about one inch thick. A few days since occasion was had to dig up the pipe, and the whole length of the wooded drain was found to be charred, and apparently burnt, about three-fourths of the thickness of the wood, the other fourth being partially rotted. The whole inside of the drain was turned to charcoal, with here and there spots of white ashes, showing the ignition had actually taken place. It seems probable that if the casing had not been excluded from the air by the earth covering, it would have blazed and been entirely consumed. It is generally believed that a steam pipe cannot set fire to wood, but this case seems to prove the contrary, and it may explain the origin of many mysterious fires. It indicates at least that care should be taken to prevent the close proximity of easily combustible material to steam pipes carrying a high pressure of steam. The temperature of steam due to a pressure of 100 pounds per square inch is about 337° Fahr.—*American Manufacturer.*

Flavoring Meat on Foot.—M. Moucler, a noted agriculturist in France, advocates the flavoring of meat on foot, by appropriate feeding. He says that by flavoring the food of cattle, sheep, pigs and poultry, their flesh may be rendered much more agreeable to the palate than it often is. He is substantially right, for reasoning by contraries, we know that rabbits, quail, deer, etc., which feed and browse upon the artemisia and bitter seeds have a disagreeable flavor when eaten. Any flavor may be given the meat—mint, anise, thyme, etc., and several tastes may be given the meat, or a compound flavor be added by a variety of flavors of any selection. For invalids particularly, or for epicurean palates, the common meaty flavor can be modified in flavor to suit the palate, and the aversion to healthy, nutritious meat be overcome by a delicious conglomeration of sweet flavors. We hope to see the experiment tried in our State.

Camphor Balls.—Clarify a pound of mutton suet, and add to it three pounds of spermaceti, two of white wax, and one of gum camphor, cut into very small pieces. Melt these together with gentle heat, and stir until the camphor is dissolved; then pour it into molds. Frequent application of this emollient will prevent disagreeable roughness of the hands. Should they become chapped, a most effectual but inconvenient way of healing them is to wrap them in wet cloths with an outside bandage of flannel, first making a free application of the camphor balls. This treatment will soften and whiten the roughest skin, and it is also an excellent application in chronic rheumatism.—*Boston Journal of Chemistry.*

Manufacture of Jam in an English Town. The motto of the Kentish town of Maidstone might well be "jam satis," for the making of jam is becoming one of its chief industries. One manufacturer alone, Mr. E. Steer, is reported as boiling up last season the astounding mass of 2,000 tons. This extraordinary quantity was chiefly made up of black and red currants, raspberries, damsons and plums; and to contain it seven large loads of jars were required, in sizes capable of holding from 4 to 14 pounds each.—*Ex.* [Let California fruit growers and canners make a note of this jam business. The English palate has a weakness for jam, and we ought certainly to be able to divide the honors with Mr. Steer.]

To Stop Leaks in Barges.—There are only about ten inches of water in the rivers about Pittsburg, and the acres of coal boats and barges are getting very dry, and the seams are opening. When a coal craft is leaky a keg of dry sawdust, packed tight, is lowered into the water in front of the barge. At a point beneath the surface a sudden jar dislodges the sawdust, which floats up and lodges against the bottom and sides of the boat. Wherever a crevice admits water the sawdust is drawn in, sticks there, and swelling, makes a water-tight job that will last long enough to save the boat and cargo.

A New Paint for Plastered Walls.—An excellent paint for ceilings and walls has been invented by a German named Reissig. It prevents the formation of fungi, and renders the surfaces coated with it impermeable to fluids or vapors, and capable of being washed down with boiling water without injury. This paint is a solution of about 50 grammes of stearate of soda in 1,000 grammes of spirit having a specific gravity of 66. The solution may be given any desired tint by the use of the aniline dyes, or of ocher, ultramarine or such other colors as are not subject to decomposition.

Mildew in Canvas Sails.—To take mildew out of canvas sails, saturate the spots with a solution of calcium hypochlorite (bleaching powder) in cold water or vinegar; using plenty of cold water afterwards to rinse. Mildew in canvas sails may be prevented by treating the sails with a strong aqueous solution of alum, or sugar of lead.

Enamel for "Porcelain" Kettles.—Grind together 100 parts of powdered calcined flints (or white quartz sand, free from iron), 50 parts of calcined borax (borax glass), and 20 parts of kaolin (white potter's clay), pass the mixture through an 80-mesh sieve, and mix it with water to form a thin paste. Line the clean vessel with this and let it dry slowly. Then fuse together 125 parts of white glass, 25 of borax, and 20 of soda; powder when cold, and make into a thin paste with four parts of soda and a sufficient quantity of hot water. Cover the first coating with this, and, after thoroughly drying, heat in a muffle until the glazing has properly fused.

A Brick-Lined Tank.—The *Metal Worker* says that some years since Prof. Chandler, President of the New York Board of Health, built a tank which was not only serviceable but cheap. He had made of stout plank a large box carefully braced, and lined it with bricks, each one of which was dipped in melted coal-tar just before it was laid in place, the coal-tar serving instead of mortar. A thin coat of this substance was spread over the inside, which made the tank thoroughly water-tight.

Cement for Bisulphide Prisms.—A good cement to fasten the sides of bisulphide of carbon prisms is made of a mixture of good glue and concentrated glycerine, the composition used for making rollers in printing presses.

Good Health.

Sight and Reading.

M. Javel, in a recent lecture, tries to answer the question, "Why is reading a specially fatiguing exercise?" and also suggests some remedies for this fatigue. First, M. Javel says reading requires an absolutely permanent application of the eyesight, resulting in a permanent tension of the organ, which may be measured by the amount of fatigue or by the production of permanent myopy; secondly, books are printed in black on a white ground. The eye is thus in presence of the most absolute contrast which can be imagined. The third peculiarity lies in the arrangement of the characters in horizontal lines, over which run our eyes.

If we maintain, during reading, a perfect immobility of the book and the head, the printed lines are applied successively to the same parts of the retina, while the interspaces, more bright, also affect certain regions of the retina, always the same. There must result from this a fatigue analogous to that which we experience when we make experiments in "accidental images," and physicists will admit that there is nothing more disastrous for the sight than the prolonged contemplation of these images. Lastly, and most important of all, in M. Javel's estimation, is the continual variation of the distance of the eye from the point of fixation on the book. A simple calculation demonstrates that the accommodation of the eye to the page undergoes a distinct variation in proportion as the eye passes from the beginning to the end of each line, and that this variation is all the greater in proportion to the nearness of the book to the eye and the length of the line.

As to the rule which M. Javel inculcates in order that the injurious effects of reading may be avoided, with reference to the permanent application of the eyes, he counsels to avoid excess, to take notes in reading, to stop in order to reflect, or even roll a cigarette; but not to go on reading for hours on end without stopping. As to the contrast between the white of the paper and the black characters, various experiments have been made in the introduction of colored papers. M. Javel advises the adoption of a slightly-yellow tint. But the nature of the yellow to be used is not a matter of indifference; he would desire a yellow resulting from the absence of the blue rays, analogous to that of paper made from a wood paste, and which is often mistakenly corrected by the addition of an ultra-marine blue, which produces gray, and not white. M. Javel has been led to this conclusion both from practical observation and also theoretically from the relation which must exist between the two eyes and the colors of the spectrum.

His third advice is to give preference to small volumes which can be held in the hand, which obviates the necessity of the book being kept fixed in one place, and the fatigue resulting from accidental images. Lastly, M. Javel advises the avoidance of too long lines, and, therefore, he prefers small volumes, and for the same reason those journals which are printed in narrow columns. Of course every one knows that it is exceedingly injurious to read with insufficient light, or to read too small print, and other common rules.

M. Javel concludes by protesting against an invidious assertion which has recently been made "in a neighboring country" (Germany no doubt), according to which the degree of civilization of a people is proportional to the number of the short-sighted shown to exist by statistics; the extreme economy of light, the abuse of reading to the detriment of reflection and the observation of real facts, the employment of Gothic characters and of a too broad column for books and journals, are the conditions which M. Javel believes lead to myopy, especially if successive generation have been subjected to these injurious influences.—*London Times.*

The Effects of Drinking Coffee.

The brown beverage prepared from the berry, improperly so-called, of the Levant leads more than half the world vanquished in its triumphal train, mocking the energetic and barbarous means employed to combat it and check its march. It has found innumerable friends and willing subjects, not only in Europe and Africa, but in America. In the Orient and in Middle Germany it has become the national drink, England and Russia alone preferring the tea-canister to the coffee-pot. The reason of this extended popularity, and the physiological action of coffee have not hitherto been clearly understood. Prof. C. Binz, an investigator to whom we are indebted for a explanation of the action of alcohol, has also rendered a service by carefully examining the active constituents of coffee, namely, caffeine, the empyreumatic substances produced during the burning, and its potash salts.

Moderate doses of caffeine produce an increase of bodily temperature without any symptoms of illness being perceived at the same time. Large doses, which caused perceptible stiffness of the muscles, disquiet, and flow of saliva, were attended with increase of temperature, reaching a maximum in one or two hours, and then decreasing somewhat, but frequently lasting for hours. This action of caffeine renders it an antidote to that of alcohol, and it is employed to counteract the effects of opium also. Experiments made upon dogs show that it is able to check the fall in temperature caused by alcohol, and to produce a continued wakefulness in place of the stupefaction of opium.

Empyreumatic compounds found in burning, and called in France *caffeon*, consisting chiefly of burned oils and bitter principles, also contribute to the action of coffee upon the system. To test their action when isolated from the caffeine, Binz employed the aromatic distillate of a strong decoction of coffee, which smells strongly of coffee. It caused increased activity of the heart with more frequent breathing, and reduced the pressure of the blood.

The increase of temperature assigned to caffeine, by Binz, can result only from an increased decomposition and consumption of material. For most coffee drinkers, the real effects of the drink are due solely to the moderate excitement of these oils.

Hearing and how to Keep It.—Lindsay & Blakiston, 25 South Sixth street, Philadelphia, have published a valuable work under the above title. The book is Vol. I. of a series of American Health Primers edited by W. W. Keen, M. D. From the mass of information contained in it we learn that the ear should not be tampered with, sweet oil and other greasy substances should never be dropped into the ear; they make it heavy, sticky and cloggy. The oil soon becomes rancid and affords a fit soil for the growth of a fungus which may entirely destroy the hearing. Poultices should be avoided both in eye and ear, for they are apt to induce proud flesh. Care should be taken of the bodily comfort, warmth, etc., and the ears protected against cold drafts and other changes. Great care also should be taken not to pull the ears of children, or "box" their ears, a practice which may endanger the hearing in after life. If the ear should become affected through any cause a simple treatment should be adopted. If the ear runs, it should not be stopped up with cotton or any other substance. The matter must be allowed free egress, and the syringe should be gently used with lukewarm water. The great delicacy of the ear requires the gentlest manipulation, and all the nostrums advertised to drop in it, or sponges to scrub it out, must be avoided. As to the eye bright colors and pleasant objects are grateful, so to the ear sweet music, pleasant company, etc., are beneficial. Brightness of nature and cheerfulness of character have more to do with the preservation of health than is dreamed of. The above book may be found at A. L. Bancroft's.

Absinthe in France.—According to the deposition of Dr. Blanck, absinthe causes 60% of the cases of insanity in France. The *liqueur* is produced by the distillation of alcohol with wormwood (*Absinthius vulgaris*), either pure or mixed with other herbs. Several are used for the purpose of varying the flavor,—for instance, the anise (*Anisum*), the angelica (*Angelica archangelica*), etc. M. Magnan, in a series of experiments on animals, has found that the poisonous properties of absinthe are much greater than of any other spirituous liquor, even alcohol. The leading members of the medical profession in France are strongly opposed to teetotalism. They not only prescribe alcohol in various cases, but recommend the use of such stimulants to their patients in moderation; but they unanimously condemn absinthe.

Eucalyptus in a Cold of the Head.—Prof. Stramhio, in a note in an Italian medical journal, says that notwithstanding the failure of all remedies hitherto recommended for the immediate cure of a cold, he wishes to communicate to the profession the great success he has found attending a new one in his own person, and to ask them to test its efficacy. He found prolonged mastication and swallowing of a dried leaf or two of the *Eucalyptus globulus* almost immediately liberated him from all the effects of a severe cold.

MINING AND SCIENTIFIC PRESS.

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Metallurgical Works, Strong & Co., S. F.
Improved Grounds for Sale, C. Fieldsted, San Jose, Cal.

The Week.

There is not much comfort to be derived from the aspect of the mining business, if we regard it in the sole light of a speculation. But considering the results of the past week from a substantial and legitimate standpoint, values are finding their proper position in the financial scale. When Daniel Webster was censured for making the law his profession, when that profession was already so crowded, he used to reply "there is room enough at the top." There certainly is room for mining interests at the top of the scale, but there undoubtedly is considerable "debris" from the base of the ladder all the way up. Now an enormously rich strike is made successively in our various mining regions, while the irrepressible Yaqui Indian turns up with chunks of silver weighing 3,500 pounds found in Sonora. So great is the richness of the reported "finds" that our fears sometimes lead us to believe that the market for precious metals will be immediately glutted. But *modified* statements soon come in and our fears are relieved. The mining novelist finds scope for the full display of his imagination in our gold fields, as well as the sensational writer in other fields of human affairs.

To offset all of these glittering accounts, it is a relief to come down to the hard fact, that the Comstock has piled upon its shareholders $2,000,000 to be paid within the next 60 days, and that $500,000 more will be called for before the month is out. No dividend is promised as an offset; in fact a dividend and an assessment would be an anomaly. Just now the "bonanza" seems to be in the pockets of the stockholders. Three-fourths of this assessment money will come from Pacific Coasters and about one-fourth from Eastern investors. In the case of the Bullion and Exchequer, where prospecting has been a failure down to the 2300 level, except the stock words "favorable indications," the enormous amount demanded from stockholders to dig another hole in the ground is plainly pronounced a swindle. The managers of the Comstock seem to be vieing with each other to get all the money they can.

The Evils of Big Surface Ore Finds.

The averment that the finding of extremely valuable deposits of the precious metals on or near the surface is a matter to be deprecated will, to most ears, sound wholly paradoxical. By the masses, and even by some educated miners, the bare suggestion of such an idea will be regarded as an economic heresy, if not the vagary of a diseased imagination. To the inconsiderate nothing in the prosecution of this industry seems so desirable as the finding of just such bodies of ore under just such conditions. Why, they argue, is it not better to come upon them right in the croppings than to be obliged to go delving after them in the dark bowels of the earth? And at first thought their reasoning seems sound enough. *A priori* we would all incline to say the same thing. But unfortunately our experience contradicts the conclusion. These great surface strikes have not always proven happy events, all things considered. On the contrary, the most of them have been productive of infinite mischief. Where they have been or promised to be of great magnitude at the start, they have almost invariably lead to so much premature outlay, disappointment and loss as might justly cause us to deprecate their occurrence. Almost every noted discovery of this kind that has happened in our day has been attended with so much that was evil as to warrant its being characterized as a real misfortune.

Nor can we except from this remark the finding of the pioneer bonanza on the Comstock lode, the typical discovery of this new departure in vein mining, when the business, laying aside its slow and conservative ways, took on more vehement and extreme modes of procedure. It has been too much the custom to laud this discovery as an event of unmixed good. That it gave an impetus to this branch of mining and led to a more early and rapid exploration of the great interior basin and other outlying mineral districts, than would otherwise have ensued, is no doubt true. That it has encouraged the investment of capital in this industry and hastened improvements in everything pertaining to ore extraction and reduction, cannot be denied; yet there is much to off-set such total of benefits resulting from this Comstock ore find. If it tended to hasten exploration and perfect improvements, it evoked at the same time a spirit of reckless adventure, wild speculation and improvident expenditure. If it helped to increase bullion production and accelerate the settlement of these inland regions, it done much also towards creating a feeling of general unrest, and not a little towards debauching the public conscience. And it may be, too, that we have overrated the value of this discovery as a promoter of mining and the early settling up of the countries mentioned.

Long before the occurrence of the special strike that, through a general carelessness, has been suffered to pass as the first discovery of the Comstock lode, placer mining was being carried on at several points in western Utah, now the State of Nevada. Not only so, but for more than a year prior to that event quartz mining was being diligently prosecuted at Gold Hill by a class of hardy, patient pioneers, and with a success that would no doubt have led to the wide extension and the permanent establishment of that business on the "Eastern slope," had this bonanza discovery never occurred. And, in this latter event, who shall say that this industry would not have experienced a more healthful, though perhaps a slower growth than it has since done? What of disaster and loss might not have been avoided had this pursuit been left to advance into these desert regions by slower stages and surer methods than those since employed to force it forward! What of wasted means and wasted lives might have been saved had mining been extended into these distant fields in a temperate and judicious manner instead of being prematurely jammed in under this Comstock craze. In view of the excesses and follies into which this discovery betrayed us, it is to be regarded as hardly less than a public calamity.

Starting out under this high-pressure action, and measuring our expectations by a standard so dangerous, we spent with a lavish hand and rushed things with a fatal speed from the first. An army of prospectors burried over the Sierra, every one of whom proposed to find for himself a veritable Comstock, and would be content with nothing less. Having located everything in the vicinity of their great sampler these silver seekers began their search after similar lodes elsewhere, spreading thence over the country in every direction. The first big thing to reward their efforts was the Esmeralda find, followed in quick succession by the Humboldt, the Reese River, and the Silver Mountain discoveries, all deemed at the time of the first importance. After an interval of a few years (none of them without their minor excitements) came the White Pine fiasco, and then the Panamint bubble, the last of these hasty and hurtful movements, unless Leadville, and perhaps other of these Colorado mining camps, shall require to be added to the list, of which there is a danger.

While none of these precipitate movements reached any large success, all, but one or two, resulted in signal failure, and yet rich mineral deposits occurred on or near the surface in nearly all these centers of attraction. The ruby ore found in the very croppings of the Reese River lodes was a marvel of beauty and richness, and it is highly probable that there never was a finer body of ore of like size uncovered than the Eberhardt bonanza at White Pine. And yet no two districts in Nevada, taken as a whole, have a more deplorable history than these. Reese River is a country of deserted camps, and White Pine a synonym of financial disaster.

A few miles to the west of White Pine is situated the flourishing town of Eureka. When the former was discovered Eureka was a hamlet peopled by a score of miners preparing to work the argentiferous galena found at that point. The superior attractions of Treasure Hill soon depopulated this infant settlement, the base, lead-bearing ores of the latter appearing poor indeed beside the rich carbonates and sulphurets of its neighbor. But how stands the case to-day? White Pine is a desolation and a ruin! Her towns and her great mills have gone to decay or disappeared altogether. Her population has left and her bullion shipments have shrunken to almost nothing, her mining interests having well-nigh suffered total extinction. But her whilom rival, which she once so emptied of its inhabitants, lives and prospers. The base-metal hamlet has grown into a populous city, surrounded by great mines and sustained by a profitable and permanent industry. It ships every year bullion to the value of eight or ten millions, with the prospect of increasing the amount largely hereafter.

Far across the deserts, in another part of Nevada, lies the Columbus district. This, like Eureka, has a dull record but a very good one. There never was any stampede to Columbus, there being no "specimen" deposits here to create an excitement and rush in the adventurous. The early population was scant and came in slowly, the ledges, which made only a fair showing of medium grade ore, having been opened, little by little, and without the aid of much capital. No more mills were put up than the mines called for, and these were at first of small capacity. But they were all kept running, and the bullion flow that commenced with the very inception of the camp having grown to large proportions, has been kept up ever since. Many other examples of this kind might be cited, all tending to show that the most stable and prosperous of our mining camps are those in which there have been found no bonanzas or extremely high-grade ores on or near the surface, and which, in the absence of turmoil and excitement, have been settled and developed slowly. Here, as elsewhere in nature, the tardy growths have been the most healthful, satisfactory and enduring, teaching that these great top strikes are not always the things most to be desired, and admonishing all of the necessity of patience and perseverance in mining.

We can scarcely recall a mining district that was opened with so much blare and crash but has since suffered collapse, or been been wholly wiped out of existence. The turmoil and racket that have attended the early settlement of mining camps have generally been in the inverse ratio of their staying qualities, and we can almost believe that there would to-day have been less in the history of the Comstock lode, with all its vast production of bullion, that we might wish to recall had its wealth been revealed to the world in some less sudden and striking way. Who shall say that it would not have been better for the interests of mining as well as the interests of morality had that revealment come through the slow approaches of these pioneer miners, operating their arastras and other primitive appliances at Gold Hill instead of being blurted out in a way that threw it into the hands of the reckless and avaricious, to be used so largely for speculative purposes. It is very likely that much might have been saved had we started silver mining on a lower plane, went somewhat slower and observed a little more caution after we entered upon it. Let us not become too much excited over these fine ore exhibits at the start, nor attach undue importance to those mineral lodes that, like vain men, carry most of their wealth on their backs.

A National Convention of Bullion Producers.

The New York *Bullion* advocates a national convention of bullion producers, and, being a New York journal is intensely New York, as, of course, it ought to be, it says: "A three days convention in Cooper Institute of prospectors, miners and ore reducers from every gold and silver district in the Union would have for its audience the representative capital and business activity of the entire East." We are strongly in favor of any convention that will have for its object the improvement and development of our mining interests, whether that object be attained by means of Eastern capital or our own. We have commercial relations with New York, and merchants of that city take pains to encourage whatever will increase their income and endeavor to attract investments. Our relations with the East are exceedingly amicable. The financial balance is against us and in favor of New York. We have gold and silver to barter for goods, and the balance against us is provided for thereby. Although largely dependent upon the product of our mines for the maintenance of commercial activity, we must not overlook the fact that mechanical and productive industries are necessary to our permanent supremacy on this coast.

Mr. Gladstone's prediction that the commercial supremacy of the world must ultimately pass from the United Kingdom to the United States, strikes conviction to every man who devotes any thought to the subject. In the torrent of commercial disaster, which lately swept over the world, America was the only nation prepared for it, and our system the only one to recover its balance and tone, while other nations, with the exception of France, are still prostrate.

England, dependent solely upon a mechanical and agricultural development, not having the material at command naturally enough overlooked the enormous character of the precious treasures buried in the American continent, and thus, the United States rivaling her in competing mechanical and agricultural industries, left her far behind in the struggle for the crown by being able to supply the world with money from bullion obtained in our own territory, and the scepter is now within our grasp. History but repeats itself in nations as well as in the affairs of men. The Roman empire, weighed down with precious metals and stones, became demoralized and perished. Later the Spanish kingdom glutted with wealth fell into decay, from which it has never recovered. So England, the commercial dictator of the world heretofore in mechanics and agriculture, must fall, and her own statesmen admit the fact.

The United States, however, by dividing her industries, developing mechanical and agricultural facilities and powers, and, at the same time, drawing bullion for money—the world's standard of exchange—from her own territory must take the lead among nations, and maintain her supremacy until the mines within her border cease to produce the coveted precious metals.

This dual character of our commercial capacity exhibited practically on this coast has caused the Eastern States to pour a stream of capital in this direction. And although mining as a business cannot be compared to any other business because there is no *quid pro quo*, but a constant diminution of value without possibility of restoration, there is enough yet, when combined with other industries, to enable us to maintain our position as a vast commercial center.

Perhaps these and other questions of moment will properly come before such a convention as has been proposed, and although our private preference would suggest San Francisco as the place of meeting, because the workings of our mining system could be practically investigated; yet we wish to favor the project and not disturb any unanimity that should exist by any sentiment that might be construed into sectional jealousy. It is proposed to hold the convention in December or January next, and the following subjects for discussion have already been suggested, viz:

Prevention of litigation; processes of reduction compared; capital of mining stock companies; mine reports; condition and prospects of our gold and silver deposits; debit and credit sides of our bullion production; gold and silver mines as national banks; progress in mining machinery; mining schools; a national mining bureau. To which we beg to add the subjects that may be derived from our remarks above.

What is Legitimate Mining?

The avalanche of abuse heaped upon our mining stock business by the friends of legitimate industries, has so nearly smothered us that we can only reply between gasps for breath. Why cannot our mining stock business be done legitimately? The profundity of the question could be better determined if the words "as it is in the East" were added, but crocodiles reserve some tears in their lachrymal glands. The mining business is always legitimate. When there is wealth of ore, gold or silver in the mine whose stock is put upon the market, and there is an earnest endeavor to develop the same by working it up into bullion, then that mining business is carried on legitimately, even if the expectations of the company should be realized only in part. When, however, a mere shaft, drift or ordinary hole in the ground, salted with a few selected specimens is foisted upon the market by some impecunious sellers, the matter assumes the character of a swindle, it does not attain to the dignity of a business. The disasters attending stock speculation have been mainly brought about by the greedy delusions of the people themselves. "Why do you break the Sabbath by selling milk?" said a preacher whose pitcher had just been filled. "Why do you break the Sabbath by buying it?" retorted the man of calcium hydrate; and the query of the moralistic reformer as to the sinfulness of stock gambling is fully answered by the retort of "why do you invest, whether on a margin or otherwise," We have always advocated the idea that stock gambling was not only wrong *per se*, but disastrous to the commercial interests and integrity of the community, and we have never neglected an opportunity to appeal to the common sense of the individual to *investigate*, and never permit himself to be misled by a fabulous return from a small investment. This is the criterion. Money yields only a certain return, say 10% or 12% per annum, all above that is unhealthy, and the higher you get in the scale of return the nearer you get to downright robbery and swindling. Be satisfied with moderate returns. A poor man with $100 cannot become rich all at once even in mines, and to speculate in stocks with it is equivalent to depositing it on the faro table. To prevent stock gambling we must begin aright and show up individually the solid companies and the wildcat.

Molera & Cebrian's System of Electric Lighting.

Continued from page 33.

cal circuit. The tubes, *J*, as well the horizontal tube and the bellows, are filled with a suitable liquid. As the current passes from one carbon point to another the core of the electro-magnet becomes magnetized and attracts the head of the bellows with more or less force, maintaining a uniform light by governing the distance between the carbons by displacing the liquid in the tubes and throwing the pistons or floats up or down, according to the strength of the current.

Should the current cease the spring draws down the head of the bellows and the points of the carbons touch. When the current is too strong, the top of the bellows is attracted upward, and the carbons separate.

Figs. 6 and 7 show a table-lamp or candle-stick, built on the same principle. *N* is a partially elastic chamber containing the liquid. *V* is either a float or a piston, holding a carbon rod or electrode, *U*; *U'* is the other electrode, held fast by an arm, *t t'*; *S S* and *T* are two electro-magnets and a spring, having adjusting screws.

By changing the tension of the spring *T*, this lamp may operate as an incandescent lamp, as a voltaic arc, or as a flashing lamp. If that tension is sufficiently strong, or no magnet, *S*, is used, *U* will always be pressing against *U'* like a Werdermann candle. But if that tension is weaker, and *S* comes into play, it will operate either as the lamp, or by flashes, according to whether *V* is a float or piston.

The upper carbon, *U'*, is a horizontal cylinder, having a circular motion, and a side motion along its axis, imparted by a screw, *t''*: by properly attending to said motions, *U'* may be worn away evenly, and be useful until nearly worn out. This is an advantage upon the top carbon of the Werdermann candle, which is worn out at a single point. This lamp would also work with different shapes of carbon, *U'*.

It will be noticed, the great similarity between this lamp and the Higgins lamp, first presented at the *conversatione* of the Inst. of C. E., the 26th of last May, at the South Kensington Museum, London. Take away in Figs. 13 and 14, the magnets, *S S*, spring, *T*, and float or piston, *V*, and there it is, the Higgins incandescent lamp. It gave very good satisfaction; it was pronounced the best table light yet exhibited; but it was not free from the element of uncertainty—it flickered yet, and it went out for a few seconds, apparently without cause. It is to be expected that the controlling or regulating apparatus, *S, S, T, f*, of Figs. 13 and 14 will prevent the objections raised to the Higgins lamps.

The applications for patents on these lamps, in which the principle of the Higgins lamp is also included, were filed by Molera & Cebrian since July, 1878, in the United States, and in January, 1879, in England.

The main characteristics of those lamps are: Their simplicity, the total absence of delicate mechanisms and the independence of the two carbons or electrodes. In the greater part of the regulators, when the negative carbon advances a distance, the positive carbon is made to advance twice as much, by the aid of some mechanism. But in these lamps each electrode moves on steadily, independently of the other one, and independently of the ratio between their wear.

Practical Estimate of Electric Light.

To conclude, we will place herein an estimate of the cost of setting this system in a mine, taking as basic the actual prices of the machines as they are now constructed.

For the expenses we will not take into consideration the cost of steam engine, as that power is already a fixture of the mine; therefore the expenses will be as follows:

One Brush machine, No. 7	$2,300
Two lamps (one reserve)	200
One chamber of light, or projector	1,000
Prisms and lenses	200
Electric fittings, etc	200
Setting up the machinery	200
Total	$4,100

In the running expenses, the item of the power will also be left out, as it has to be expended, in any case, for the mining works:

	Per. hr.
Cost of carbon points (in the case of 18 large lamps fed by one machine it is found to be 45c per hour; in the case of a single lamp it will be a great deal less—but to make allowances let it be called 45c)	45c
Attendance to electrical and optical apparatus	30c
Ten per cent. per year upon cost of outfit to cover interest of capital (taking 24 hours daily use)	4⅔c
Ten per cent. per year upon cost of outfit for wear and tear (same condit.)	4⅔c
Total expenses per hour	84⅓c

In many cases the attendance to electrical apparatus put at 30 cents per hour, may easily be left out. In this system, when the light reaches the places to be lighted, it has lost about 40% of its intensity; but in order to keep on the safe side, let it be supposed that not more than 50% is available. This expenditure will give a light equivalent to 17,500 candles, or 1,166 gas burners of 15 candles each. This number of burners will consume 5,830 cubic feet of gas per hour, which will amount to the light given by about 400 pounds of adamantine miner's candles. This amount of candles at 15 cents per pound is equal to $60 per hour, against 84⅓ cents per hour by the electric light.

Let it be noticed that a No. 7 Brush machine gives a light equivalent to 35,000 candles when it feeds 10 or more lamps; but if it was made to feed a single lamp, the result would be greater, which, nevertheless, has not been accounted for in the above estimate.

Let it also be noticed that in the above estimate it has not been taken advantage of the vacuum properties of the voltaic arc, above mentioned, nor of the advantages to be derived from the use of the quinine sulphate, which, nevertheless, both are well ascertained. In the above example all the items and expenses are perfectly warranted by actual practice; and if any deviation of the written figures has to be taken, it will be greatly in favor of the electric arc.

Fig. 4. Fig. 5.

DISBURSING LENSES WITH AND WITHOUT REFLECTOR.

PLANTS IRRIGATING FOR THEMSELVES.—It has been shown by the experiments of the late Prof. Haberlandt, that plants sometimes irrigate on their own account and thus draw nutriment from dry soils. He undertook a series of experiments on the phenomena of vegetation of plants grown in an absolutely dry soil. For this purpose he allowed the lower portion of the roots of the plants experimented on to dip down into distilled water, while the upper portion was retained in a soil so dry that the plants would otherwise, as was practically demonstrated, inevitably be withered up. The results of these trials went to show that the portion of the roots lying in the upper dry stratum of soil rich in nutritive constituents of plant life does not remain inactive, as has been generally maintained, but is chiefly occupied in supplying the plant with the constituents of its ash. As there is no absolute want of water, this being supplied by the lower portion of the root, the upper portion is enabled to secrete a certain quantity of moisture which is taken up by the immediately surrounding soil, and dissolves its earthy constituents, which are then taken up directly by simple endosmosis.

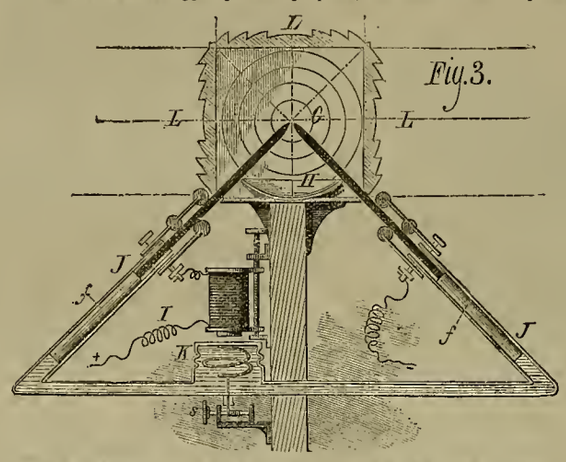
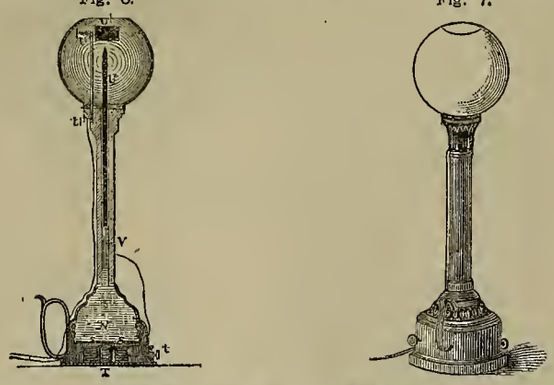


FIG. 3. SECTION OF LAMP AND CHAMBER OF LIGHT.

Fig. 6. Fig. 7.



SYSTEM APPLIED TO DESK LAMPS.

SECRETARY EVARTS has authorized the postponement of the report from the Paris exhibition until September 1st, as 16 of the 24 reports have not yet been made. The Secretary will not wait for those that are not ready by that time. The more important reports yet to be received are W. W. Story's on art, Ferguson's on fishes, Donald G. Mitchell's on household goods, Sweeney's on machinery, and Blake's on ceramics. The reports will make several volumes altogether.

The Mexican International Exhibition.

Some time ago the cable brought the report that the Mexican exposition had been abandoned, and we made a note of the fact, but now it appears that the report was a mistake, and that it was only postponed. It was known that some of the most active friends of the project thought the time too short for preparation, and were in favor of extending the date of opening for a year. This seems to be the state of the case. Mr. Yharrola, who has been acting for the Mexican government in the matter, is now in this country to arrange for extending the time of the completion of the building, and the exposition will open January 1st, 1880. We would be glad to give positive assurances that such is the case, our only authority, and it is undoubtedly good, is the *Iron Age*.

Our commercial relations with Mexico might be considerably improved, the contiguity of the nations afford natural facilities for all business purposes, and Mexico certainly desires amicable relations with the United States. Yet, singularly enough, we regard her somewhat in the light of a child to be corrected, while European nations, particularly England, regarding her as a full-grown nation, although revolutions occur as frequently almost as the diurnal revolution of the earth on its axis, and draws from Mexico millions of dollars annually on account of trade. Some day, unless we have more respect for the Mexican *pesos*, England will have a bullion in supply exceeding our own, and this with an established trade will enable that government to recover her diminished commercial activity. We have an interest in the Mexican exposition, which after all is nothing but a bid to the nations to tender samples of what she needs, on the most favorable terms, and cannot get ready for it any too quickly.

A VERY extensive forest fire is raging in the mountains west of Prescott, A. T. Great clouds of white smoke are rolling up all along the horizon. The furious wind which has been blowing all day will fan the flames and cause an immense destruction of pine timber.

THE exports of British Columbia for the quarter ending June 30th reached $145,155.

Prospects of California Mining.

We agree with the New York *Bullion* that "the English have been large purchasers of our mining properties in almost every prominent field, but nowhere have they been so successful with their patient, thorough methods, as in the gold gravel and quartz mines of California. Extraordinary richness of ores demoralize English system as quickly as they do American system, but the large and apparently interminable bodies of low-grade ore, and the cubic miles of gravel, with a few grains of gold to the yard, in California, fit the Englishman, and as a result we constantly hear of new and extensive purchases by them. The cases are very similar. Mines worked for years on the usual hand-to-mouth-waiting-for-a-big-strike style, sold at last for a tithe of what is in sight, developed adequately a few months and increased in market value a thousand per cent. We are firmly of the opinion that California's capacity of gold production is as great to-day as in 1850. In both gravel and quartz deposits she is unequaled, and she has but fairly prospected both. In 30 years California yielded more than a thousand million dollars, mended more broken fortunes, and created more than any similar territory ever did in like period. Put one-twentieth of her yield into her quartz and gravel mines now, in the light of her experience, and California will be a gold mint for the world for the next century. Nowhere in the world is there so great assurance of regular and permanent production in gold mines. We look with keen interest on the systematic development of California's mines, believing that they will sustain the State's title of The Golden, against all comers, and we regard the State as the most important gold producer on the globe."

It is of every day experience that one man will realize an income from another man's waste, and the feverish search for rich ore, nuggets and outcrops hurriedly picked over have caused more modest riches to be despised. Our State has not been fully tested as to its mineral producing capacity, and many localities exist which have only been superficially examined, a closer exploration of which will undoubtedly create astonishment at the extent of the precious metals waiting to be worked up.

California is not a close corporation, her capitalists do not hesitate to make outside investments, and are certainly entitled to a justifiable pride in the fact that our resources are drawing the attention of shrewd capitaliste from other quarters. The time for petty sectional jealousy has passed, and we have become practically cosmopolitan. If anybody finds fault with our mining system, we are ever ready to receive suggestions of improvement in good spirit. As pioneers, however, our miners have a wide influence for the weal or woe of the mining interests of our Golden State; for its weal by a fair exposition of our capacities; for its woe, by a delusive or false estimate of local values. We cannot claim a monopoly, because the precious metals are found elsewhere than in our State, and the necessity existing for supplying the world's bullion, now greatly deficient, forces the development of mines and the more careful and economical extraction of the precious metals, and in inviting capital to this State we do so with the conviction that our numerous but *attainable* deposits, if not quite so rich as the reported fabulously rich strikes in some other States and Territories, do not cost two dollars for every dollar extracted, nor endanger the life of the miner by reason of the unsettled condition of society and mixed ideas of law and order.

SALMON DISEASE.—The salmon disease afflicting the fish of Scotland is causing considerable anxiety, and it is feared that it will extend to all the rivers of the country. Sir Robert Christison, Bart., describes the disease as "a branching fungus which attaches itself in the first instance to those parts of the fish which are destitute of scales." The irritation thus produced causes the fish to rub its scales off against the sand and gravel, in doing which great cuts and gashes are inflicted, leading to death by exhaustion. Carefully conducted inquiry has failed to reveal the cause of this epidemic, which last year killed multitudes of salmon and seems no less destructive this year. There is no longer any disposition to attribute it to town sewage, as experts agree that the influence of all the refuse that goes into the rivers is inadequate to account for it.

A HAPPY EVENT.—We learn with pleasure that Thomas J. Davis, for several years foreman of the PRESS printing establishment, has concluded to change for the better, his condition in life, with the consent and connivance of Miss Grace Bartling, with whom Mr. Davie was united on the 16th instant. The columns of this paper have been indebted to Mr. Davis for their attractive appearance, and we hope his married life will be as pleasant as his efforts in that direction have been successful. We have nothing but our most earnest congratulations to offer the new couple upon their favorable venture upon the sea of matrimony.

NOTICE

TO THE

MINING PUBLIC.

MESSRS. RANKIN, BRAYTON & CO., of the Pacific Iron Works, are the only parties authorized to manufacture HOWELL'S IMPROVED WHITE FURNACE under the License of this Company.

THE STETEFELDT FURNACE CO.,

By C. A. STETEFELDT, President.

Referring to the above, the undersigned would call attention to the fact that by a compromise recently effected with the STETEFELDT FURNACE COMPANY, they have secured the use of all the patents of said Company applying to

Revolving Cylinder Furnaces,

And are thus enabled to give purchasers the license of all patent claimants, to-wit:

WHITE, HOWELL, THOMPSON,

— AND THE —

Stetefeldt Furnace Company,

Thereby avoiding all further litigation in reference to these rival claims. The great

SUPERIORITY OF THE FURNACES

Embracing these patents has been satisfactorily demonstrated. There are now some thirty of them in operation in the various mining districts of the coast, operating in all cases with economy and satisfaction, working in many localities

THE BASEST AND MOST REFRACTORY ORES UP TO 90 AND 95 PER CENT.

By an improvement—the patent for which has recently been allowed—this Furnace can be readily adjusted so as to work with equal facility and effectiveness all classes of ores.

The following are some of the Mining Companies who have recently adopted this Furnace, the most of which are now in successful operation, many of them running two and some three and four Furnaces.

NEVADA.—Grand Prize, Star, Martin White, Highbridge, Columbia, Alexander, Paradise Valley, Jefferson, Leopard, Eagle, Endowment, Independence.
ARIZONA.—Tiptop, Tiger, Peck, Hackberry, Corbin, Tombstone, Bradshaw.
OREGON—Monumental.
MONTANA—Alice Mine, Butte City.
MEXICO—Trinidad, Haruiguera, Plomosca.
PERU—Cerro de Dasco.

RANKIN, BRAYTON & CO.,

Pacific Iron Works.

CAUTION.—All persons are hereby cautioned against buying from other parties Furnaces embracing the improvements covered by the patents above mentioned, as they will be vigorously prosecuted and involved in heavy damages.

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Prices Reduced! Prices Reduced!

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PRINCIPAL OFFICE,

648 Market Street, S. F.

Office open from 7 A. M. to 9 P. M. Saturdays to 11 P. M.

Washing called for and delivered to any part of the city free of charge.

All orders receive prompt attention. For circular and rice List apply at the Office,

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PALACE RESTAURANT

218 Sansome St.

This elegant and spacious S. F. Restaurant has been re-opened with superior bill of fare daily, and is now the best and most popular dining saloon on this Coast.

Good Living at Reduced Prices

[Lunch ready at 10 A. M.] Resident business men and visitors from abroad will be wise in giving this place an early call. Examine of fare and prices.

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PACIFIC POWER CO.

Room with steam power to let in the Pacific Power Co.'s new brick building, Stevenson street, near Market. Elevator in building. Apply at the Company's office, 314 California street.

AN ENGINEER,

Favorably known in the East, desirous of settling in California, seeks position as Superintendent or Chief Draughtsman. Competent to design Stationary, Marine, Locomotive, Mill Work, Sugar and Hydraulic Machinery. Speaks Spanish. Unexceptional references. Address EXPERT, this office.

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COMPLETE THRESHING OUTFITS,

Consisting of HOADLEY'S STRAW-BURNING ENGINE, 15 horse power, JACKSON'S REMODELED PITT THRESHER, with Feeder, Elevator, Derrick, Forks and Water Wagon,

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Fully Guaranteed to Equal the Best Improved Outfits in the Market.

Also, one four-sided, six-inch SMITH'S MOLDING MACHINE, and one HOADLEY WOOD-BURNER 12 horse power, at a bargain. Also, new 3½-inch Thimble-Skein Wagons at $75, and 10-foot WINDMILLS at $80.

Machine Work and Castings of all Kinds to Order.

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SAVE YOUR GOLD!

Highly Important to Miners and Quartz Mill Men!

SILVER PLATED AMALGAMATING PLATES.

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With the most extensive facilities on the Pacific Coast, orders can be filled very promptly and satisfaction guaranteed. All kinds of metal goods plated. Send for circular.

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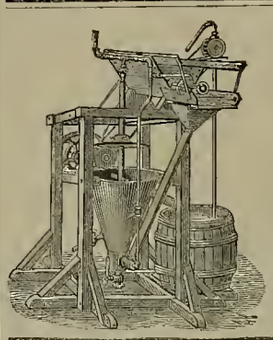

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Is the Best, Simplest and Cheapest Amalgamator in Use.

Nothing about it to get out of order or wear out. Weighs only 500 lbs—heaviest piece weighs 160 lbs. Is automatic in its working. Measures, feeds, screens and passes all material through a large body of quicksilver; then washes and cleans without care or attention. Requires no more power than a large grindstone. Uses water over and over again where water is scarce. All water required can pass through a ¾-inch pipe. Capacity, two to four tons per hour. Saves 90% of precious metals. Price, $250. Pump $25 extra. Send for circular.

ELKINS & LYNCH,

No. 381 Pine Street, - - SAN FRANCISCO.

Pioneer Plating Works.

MANUFACTORY OF

Silver Plated Amalgamating Plates,

For Quartz Mills and Gravel Claims. Are prepared to furnish any size Plate promptly and satisfaction guaranteed. Old Copper Plates purchased, Plated or the Cold Extracted by the most complete process, at small cost, and the copper saved.

JOHN MORRISON, Proprietor.

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Lots worth $300, $10 down; installments of $5 per month.
Lots worth $500, $50 down; installments of $10 per month.
Lots worth $1,000, $100 down; installments of $20 per mo.

Within 40 minutes of the business center of San Francisco, reached at an expense of 15 cents for single trips or $3 for monthly tickets, being a point at which all the important railroads of the State will center, and where the University and other educational institutions of the coast are located. With fine view and delightful climate and its present rapid improvement, all combine to make this the most desirable place to locate.

Give us a call and we will give entire satisfaction, as we have property in all parts of Berkeley, and can sell cheaper than any others. Call on

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Or at residence, cor. 6th and Bristol Sts., West Berkeley.

E. CHAMBERLAIN, JR. THOS. A. ROBINSON.

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The best Work done on the most reasonable terms on the Coast.

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Consulting Physician,

Professor of Phrenology and Mental Hygiene.

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This Institute, by combining medical hygiene with the various Water Cure treatments and the most powerful Electrized Horseshoe Magnet in the world, claims to cure speedily and permanently all forms of acute or chronic nervo-vital derangements, Brain, Spinal and Heart diseases, St. Vitus Dance, Palsy, Epilepsy and all Rheumatic, Liver and Kidney troubles. The institution has for the past 20 years made a specialty of treating all forms of weaknesses and diseases peculiar to males and females. By the use of hygienic remedies and electro-motopathy the worst forms of impotency and seminal weakness in males and sterility in females are speedily and permanently overcome. Hygienic board, with or without rooms. Terms moderate. Electro-thermal, Russo-Turkish and Medicated Baths given daily.

Mrs. Dr. Smith as Matron has charge of the female bathing department.

DR. SMITH has practiced Phrenology the past 30 years, and during the last 20 years has been constantly using the science connected with Physiognomy, in examining or diagnosing disease in this city, and claims to have made discoveries in the SCIENCE of Phrenology that enables him, by an examination of the head, even blindfolded, to determine the disease to which the person is constitutionally subject, or whether the disease at the time afflicting the person, is the result of accident or hereditary weakness; whether CONSUMPTIVE, DYSPEPTIC, RHEUMATIC, APOPLECTIC, NEURALGIC, LEUCORRHEAL, or SEMINAL. Especially does the form of the head indicate the strength of the uterine, genital or reproductive system. The head is also an index of the natural strength of the lungs, heart, stomach, liver, kidneys, spleen, back or vertebra, and it determines the power of the system in warding off and overcoming disease of all kinds.

Ladies or gentlemen, desirous of obtaining a thorough and correct Phrenological examinations with Fowler and Wells' charts, will meet with a respectful reception at his consulting rooms. Parties can depend upon a reliable delineation of the character of their intimate male or female friends, by presenting a clearly defined photograph.

Phrenological or Physiognomical examinations without charts, $1.50; with charts, from $2 to $3.

INVITATION TO INVALIDS

And all persons who are in any way out of health, who desire to know the nature and causes of their disease, may avail themselves of an examination through phrenology in regard to health free of charge, between the hours of 9 A. M. and 3 P. M. Sundays from 9 A. M. to 12 M.

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The German Savings and Loan Society.

For the half year ending this date, the Board of Directors of the GERMAN SAVINGS AND LOAN SOCIETY has declared a Dividend on Term Deposits at the rate of seven and one-fifth (7 1-5) per cent. per annum, and on Ordinary Deposits at the rate of six (6) per cent. per annum, free from Federal Taxes, and payable on and after the 15th day of July, 1879. By order.

GEO. LETTE, Secretary.

San Francisco, June 30th, 1879.

Metallurgy and Ores.

Nevada Metallurgical Works,

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Near First and Market Streets.

Ores worked by any process.
Ores sampled.
ASSAYING in all its branches.
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WORKING TESTS MADE.
Plans furnished for the most suitable process for working Ores.
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Mining Engineers and Metallurgists

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Also, to our large and well adapted stock of

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☞Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in grains and grammes, will be sent free upon application.

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Will examine, report on, and survey mining properties.

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Will Contract for the erection of
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— ALSO —
LEACHING WORKS,
With all the Latest Improvements. Address
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In use in the largest and best Mines of the Coast.

HAS AUTOMATIC FEED.

Has less Repairs.

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Our DRY AIR COMPRESSORS are the most Economical Compressors in the Market.

MINERS' HORSE-POWER.

This Power is especially adapted to working mines, hoisting coal or building material, etc. It will do the work of a Steam Engine with one-tenth the expense. One Horse can easily hoist over 1,000 pounds at a depth of 500 feet.

The Power is mainly built of wrought iron, and cannot be affected by exposure. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending bucket. The frame of the Power is bolted to bed-timbers, thus avoiding all frame work. When required these Powers are made in sections for packing.

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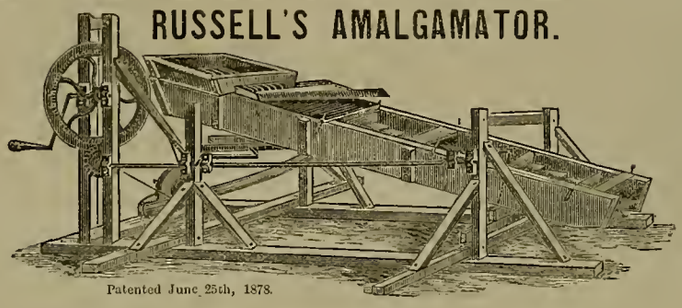
RUSSELL'S AMALGAMATOR.



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And Also SAVE YOUR QUICKSILVER.

The above Washer and Amalgamator with new patent Wire Bridge Quicksilver Boxes attached, can be worked wet or dry, either by hand, steam, horse or water power, and is easily taken apart and packed. For washing Pulp, Earth, Gravel, Mill Tailings or Black Sand, it is without a rival.

Has been Thoroughly Tested and given Complete Satisfaction.

The entire Lining, Hanging Plates, Riffles and Boxes Amalgamated

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Capacity, 30 to 60 tons per day, according to size. For further particulars apply to

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SANDERSON BROS. & CO.'S

Best Refined Cast-Steel.

Warranted Most Superior for Drills, Hammers, Etc.

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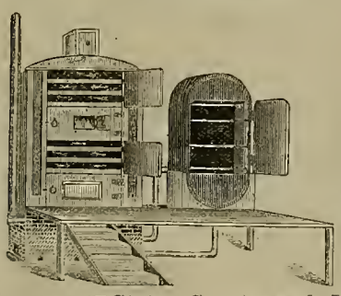

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Fruit, Vegetable and Hop Drier

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The cheapest, quickest and greatest labor-saving Drier ever introduced. Retains the quality, color and flavor of the fruit. The Canning Apparatus has a capacity of from 500 to 4,000 cans per day. Machines varying from 500 lbs. to 10 tons capacity per day constantly on hand. For Circulars, prices, etc., address

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C. C. Bitner's Apparatus for Obtaining Metallic Copper from its Solutions.

Patented March 18th, 1879. Will precipitate with steam in three hours, requiring no machinery to run it. Cost of constructing apparatus, $75. The old cylinder process takes four hours to precipitate and costs from $1,200 to $1,500 to construct, besides the machinery to run it. For right to use my Precipitator address C. C. BITNER, Spenceville, Nevada County, California.

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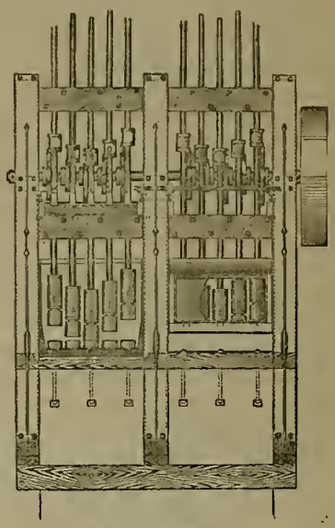
GOLD AND SILVER Grinding and Amalgamating MACHINERY.

Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver Ores, Chloridizing Furnaces, Retorts, Rock Drills, Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill Supplies.



SPERRY'S Wrought-Iron Frame FOR STAMP MILLS.

Great saving in time and money over the wood frame. Is made complete with wrought-iron frame ready to put upon the foundation, requiring no skilled millwright. These mills are unsurpassed in excellence in every particular.
We are furnishing all the Machinery for a 10-Stamp Gold Mill, including Crucible, Steel Shoes and Dies, Boiler and Engine, Counter Shafting, Pulleys, etc., Stamps weighing 450 lbs. each, with Copper Plate inside of the Mortars, and for tables outside, making all the Machinery complete for a 10-Stamp Mill for the sum of

$2,250.

We construct Mills with Stamps weighing from 350 to 900 lbs. for gold or Silver Ores. Wet or dry Crushing Mortars. Will contract to erect complete Gold and Silver Mills on the most improved plans. We have 30 years' experience in mining and milling Gold and Silver Ores, and can compete with the world. Send for a circular. Address

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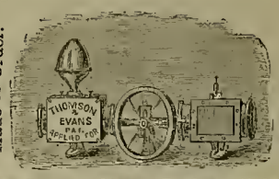
(Successors to THOMSON & PARKER.)

Engineers and Machinists.

Rubber Suction HOSE Made to Order.



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Steam Pumps, Steam Engines, Hoisting, Pumping, Quartz Mill, Mining, Saw Mill Machinery, Specialties.

Plans and Specifications for Machinery furnished. Repairing promptly attended to.

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THE IMPROVED O'HARRA CHLORIDIZING FURNACE.

Patented Sept. 10th, 1878.

Now in Operation at the Extra Mining Co.'e Works, Copper City, Shasta Co., Cal.

Two men and two cords of wood roast

Forty Tons of Ore in Twenty-four Hours,

Giving a full chlorination (100%) at a cost of 30 cents per on. Address,

O'HARRA & FERGUSON,
Furnaceville, Shasta Co., Cal

Or CHAS. W. CRANE, Agent,
Room 10, Safe Deposit Building, San Francisco

Take the Paper that stands by your interests.

The Hayford Process.

We lately published an item headed "Preserving Timber by the Hayford Process a Failure," reprinted from the *American Ship*. We supposed the authority to be reliable, and es we do not wish to injure the development of eny improvement in wood-preserving processes, we willingly give space to Edward R. Andrews, the proprietor of ths Hayford system of wood preservation, No. 4 Postoffice square, Boston, who has writtsn us a personal letter upon tbe subject. Mr. A. says the article in the *American Ship* is entirely false, and originated in his refusal to give that paper an advertisement. If this be true, it is sufficient to condemn aoy journal guilty of this petty revenge.

Samuel H. Pook, Naval Constructor of the U. S. N., in his official report on the timber creosoted by the "Hayford" process in the steamship *Vandalia*, after six years sei vice found the timbers still impregnated with creosote, and as Mr. Andrews justly says: "If the streogth of the timbers of ths *Vandalia* had been destroyed by the creosoting process the *Vandalia* would not have been pronounced sound and permitted to go to sea egain without repairs."

The whole amount of timher creosoted in the *Vandalia* was 650,029 feet, hoard measurs, being white oak timber and plank and 400 knees, es well as white and yellow pine timber and plank.

Dr. Von Baumhauer, Commissioner of Centennial exhibition from Holland, approves of the Hayford process, gives numerous instances in his report upon the teredo navalis of the success of this creosoting process in preserviug timbers exposed to the ravages of that marine horer.

John Bogart, of the American Society of Civil Eogineers, in his pamphlet upon the use of timher pressrved and unpreserved, cites elso numerous instances of the value of the Hayford process and its practical success es demonstrated by its proprietor.

Our space is limited and we cannot do full justice to this important subject. From all accounts we feel at liberty to say that tbe *American Ship* is in error as to the *practical* results of the creosoting process.

A Correction.

EDITORS PRESS:—In the article entitled "Intersecting Cable Wires," which appeared in your issue of July 12th, there are one or two errors which you will please do me the kindness to correct. Referring to my new penetrable grip, it is stated in that article that "the flangs is broken only to admit the intersecting cable passing through at right angles, the passing cable turning the notched whesl and directing the cable into the next wheel and so on until passed. Tbe lower gear of the grip—that pert below the notched wheels—is provided with an inclined plane projecting out in front of it, which forces the cross cable upon a pulley attached to a stationary ceble lifter, and thence on and in between the notched wheels." * * * Now the notches in the wheels are sufficiently large to receive not ooly the intersectiog cable hut also a har which is attached to the cable lifter and which alone turns the wheels. The inclined plane mentioned ebove does not come in contact with the intersecting cable, hnt it simply raises the ceble lifter. The intersectiog cable rests on a pulley attached to the cable lifter in the same manner es it rests on other pulleys placed at intervals throughout its leogth, and this pulley is the only thing at the crossing that touches the intersecting oable when it is being crossed. The cable is merely gently raised up by the pulley on which it runs and it then passes entirely through the grip absolutely without touching any part of it, after whioh it is lowered to its former position.

VITRUVIUS FRAZEE.

San Francisco, July 12tb.

A SWISS EXHIBITION.—Switzerland has eppointed the year 1881 for an international exhibition of watches, jewelry, snuff boxes and musical boxes—a display in which the ancient republic may well call the rest of the world to see what she can do. This project adds another illustretion to the recent tendency of international exhibitions, especially in smaller countries, to run to specialties. This will be the first exhibition of the sort in Switzerland.

THE New Jersey Supreme Court has affirmed the death sentence prononnced against Mrs. Smith aod Cove Bennett for the murder of the former's husband at Jersey City. What became of the money raised to procure a reversal?

THE Central Pacific railroad uses a hand car with three wheels for one person. Weight of car 100 pounds, propelled hy band or foot. Speed about 18 miles per hour.

A "PACIFIC Ladies' Escort Company" is about to be organized in San Francisco with branch agencies all over the coast. A prospectus will eoon be issued.

PORTABLE gas is sold end delivered in Englend like milk. People in the country and villages receive it in copper vessels from large cities.

TABLE No. 1.

PROPORTION OF PRODUCTION OF GOLD AND SILVER FROM 1493 TO 1875.

Production.	Years.	Silver.	Proportion of Silver to total of Precious Metals.	Gold.	Proportion of Gold to total of Precious Metals.	Total weight of Precious Metals, Silver and Gold.	Year.	Ratio or Value of Silver to Gold.
		Lbs.		Lbs.		Lbs.		
1493-1520	28	2 895,200	89	357,450	11	3,252,556	1497	10.75
1521-44	24	4,552,500	93	378 048	7	5,140,608	1543	11.27
1545-80	15	10,968,320	97	299,552	3	11,345 955	1599	11.55
1581-80	20	11,918,400	98	300,960	2	13,478,960	1552	11.01
1581-1600	20	18 431,600	98	324,720	2	18,756,320	1582	11.40
1601-20	20	18,603 200	98	374 800	2	18 982,480	1601	11 86
1621-40	20	17,318 400	98	365,200	2	15 236 700	1624	13.42
1641-60	20	16,117,800	98	383,880	2	16,503,080	1648	15.10
1661-80	20	14,828,000	97	407,440	3	15.235,440	1680	15.10
1681-1700	20	15. 43,500	97	473 660	3	15,517 260	1687	14.94
1701-20	20	15,646,400	97	564.080	3	16,210,480	1701	15.07
1721-40	20	18 972,800	96	839,520	4	19,812,320	1711	15.05
1741 60	20	23,457 500	98	1,032,840	4	24 541,220	1741	14 92
1761-80	20	28,720,560	97	836,480	3	27,207,178	1761	14.54
1781-1800	20	38,678,640	98	782,760	2	35 333,740	1781	14.72
1801-10	10	19,671,300	98	391,110	2	20,062,455	1801	15.46
1811-20	10	11,896 500	98	231,790	2	11,154 740	811	15.53
1821-30	10	10,131 880	97	312,520	3	10,445,072	1821	15.95
1831-40	10	13,121,900	97	446,358	3	13,568,258	1831	11.72
1841-50	10	17,169,130	93	1 204,698	7	18,870,514	1841	15.70
1851-55	5	9,747,265	82	2,172,665	18	11,919 930	1851	15.46
1855-60	5	9,954,890	81	2,256 530	19	12,222,528	1856	15.38
1861-65	5	12,112,550	85	2,035 353	14	14,149,003	1861	15.26
1866-70	5	14,729,935	87	2,110 900	13	16,840,835	1865	15 43
1871-75	5	21,563 675	92	1,877,425	8	23,541,100	1871	15.57
Total	383		95		5			

TABLE No. 2.

WEIGHT OF GOLD AND SILVER COINED BETWEEN 1851 AND 1875, ACCORDING TO COUNTRIES.

Countries.	Space of Time.	Gold.	Proportion of per centage	Silver.	Proportion of per centage
		Lbs.		Lbs.	
Great Britain	1851-1875	2,145,230	16.9	2,516,184	2.7
Australia	1855-1875	689,854	5.4	.....	....
British India	1851-1875	21,230	0.2	38,861,100	41.0
United States	1851-1875	2,593,755	20.4	4 198,512	4 5
France	1851-1875	4 308,458	33.8	10 242,122	11.0
Belgium	1851-1857	231,792	1.8	4,350,682	4.5
Italy	1853-1875	250 854	1.2	4,221,074	4.5
Germany	1857-1875	1,029,534	8.1	10,858,276	11 7
Austro-Hungary	1858-1875	181,720	1.4	7,008,980	7.6
Russia	1851-1875	1,308.076	10.3	3,679,104	4.0
Scandinavia	1873-later	56,770	0.5	449,922	0.5
Netherlands	1852-1875	.....	....	7,234,392	7.8
Total		12,828,270	100 0	93,519,908	100.0

The Production of Gold and Silver.

Inasmuch as money made of gold and silver forms the hasis of ell commerce, the production of these commodities cennot fail to interest ell concerned in trade, even in ths remotest way. Iu fact, ws may go farther and say that it hes an importance for each and svery individuel emong all nations and all peoples, end in all time. Especially must it interest ths peopls of the Pacific Coast. Everything hearing on it shonld particulerly interest the readers of a commerciel papsr. Now, there are hundreds of experts all over ths world who make a business of studying the reletions of gold end silver to each other, the methods of the production, and the influence of thet production on trade, commerce and the progress of peoples end nations. One of these is Dr. Adolf Soetbeer, whose nationality may he surmised from his name. He has examined most of the facts connected with the production of the precions metals from the period of the discovery of America by Columhus, and eome eelections from his repertory of information appear in the London *Economist* of a recent date.

These are in the highest degree interesting. We heve converted the kilograme,in which the weight is expressed in the original tahies, into pounds avoirdupois, as being most familiar to our readers. It would appeer from the first tahle that Mexico hes produced 25 per cent. more than one-third of ell the silver; Peru and Bolivia more then one-sixth eech, end that these three countriee of South and Central America have together produced more than four-fifths of all the eilver thet has been given to the world during the past four hundred yeers. The United Stetee is low down in the scale, producing only one thirty-sixth of the whole, while, contrery to the received opinion, Germany and Austro-Hungary eech exceed the United States hy more than 50 per cent.

In the gold product the United States bears the palm, having produced somewhet less than one-fourth of the whole; Australia ahont oneteuth less than the United Statee; the Rnesiau Empire and Brazil, respectively, about one-half the proportion of the United States; New Granada a little more than one-half; Austro-Hungery comes in for ebout one-half the proportion of the Russian Empire.

Table No. 1. showe that the proportion of gold, owing to the quantities hrought from America by the first Spenish conqueror, was then much greater than at eny eubsequent period for three hundred and fifty yeers. It decreased proportionately with silver for more than one hnndred end fifty years, increased slowly till 1841—then rapidly till 1860, on account of the discoveries in California end Australia, when it made up one-fifth of the whole weight of gold extracted. Since then it has decreaeed to lese than half the emount. One-ninth of all the gold was extracted in five years, between 1856 and 1860.

Table No. 2. gives the coinages in pounde avoirdupois for twenty-four years, and shows that that of Francs wes in gold one-third of the whole; ths United States, ahout one-helf that of France, Grsat Britain following a little hshind ths United States. In silver coinage British Iudia took the palm—only one-fifth less than one-half of the whole velue, in dollers heing about $670,000.000 ont of e total of $1,500,000,000. France cams in next with one-fourth the proportion of British India; Germany a littls lighter than France; Anstro-Hungary with three-fourths that of Francs; the United States about 41 psr cent of that of France; Grsat Britain about one-helf of that of the United States.

Thers is one featurc of thess tahles that dsserves nots, and that is ths apparent discrspancy between the amount of gold and silver produced and coined—the lattsr being largely in excess. The discrepancy is all ths greater when it ie reflected thet a good deal of the precions metals produced has been used in mennfactures and arts. The quentities produced and coined compare ae follows:

	Gold—lbs.	Silver—lbs.
Coined	12,828,275	93 619.908
Produced	10,453,973	68,208,415
Excess coined	2,343,303	25,411,493

This shows that there has been a great deal of re-coinage, for that ie the way in which the apparent excese comes.

STATEMENT OF THE TOTAL PRODUCTION OF PRECIOUS METALS FROM 1493-1875.

Countries.	According to Weight Silver, Lbs.	Gold, Lbs
Germany	17,390,802	.....
Austro-Hungary	17,094,297	1,013,430
Various European Countries	15 240,400	.....
Russian Empire	5,343,658	2,274,041
Africa	.....	1,609,520
Mexico	187,551,800	583,588
New Granada	... .	2,671 900
Peru	68,688 400	359,810
Potosi (Bolivia)	82.978,720	545 8 0
Chili	5,739 800	579 9 0
Brazil	.... .	2,281 510
United States	11,597,300	4,457,420
Australia	.....	3,986 400
Various Countries	4.400 000	333,640
Total	397,725,187	20,797.959

Value of silver (estimated) $5,400,000 000
Value of gold (estimated) 8,000,000,000

Total $12,400,000,000

Of the totel value of silver, Mexico, Bolivia and Peru have produced $4,150,000,000; Mexico hereelf more than one half; the United States over $185,000,000; Europe over $906,000,000. Of the total value of gold, the United States ie credited with nearly $1,300,000,000; Auetralia with over $1,100,000,000; Ruesia with about $290,000,000; South America with the greater part of the balance. These figures only come down to the close of 1874.

THE WEIGHT OF GOLD AND SILVER COINED BETWEEN 1851 AND 1875, ACCORDING TO PERIODS.

Period.	Gold.	Proportion of Percentage.	Silver.	Proportion of Percentage.
	Lbs.		Lbs.	
1851-1855	2,625,531	19 8	10,942,514	11.8
1855-1860	2,802 975	22.0	21,579,316	23 3
1861-1865	2.455.48	19.3	20 534,492	22 2
1865-1870	2,010 338	15,9	19,326,450	20.9
1871-1875	2,922,942	23,0	20,233,576	21.8
Total 1851-1875		100 0		100.0

ESTIMATE OF PRODUCTION OF GOLD FROM 1875 TO 1878.

	1876.	1877.	1878.
United States	$47,000,000	$45,000,000	$39,000 000
Australia	47,500,000	35,000,000	35,000,000
Other Countries	30,000,000	30,000,000	30,000,000
Total	$114,500,000	$111 000,000	$104,000,000
Proportion of gold to production of precious metals	8¼ p. c.	7½ p. c.	8 p. c.

PRODUCTION OF SILVER.

	1875.	1877.	1878.
United States	$40,000,000	$45,000,000	$36,000,000
Mexico and S Am'ca.	27 500,000	30,000,000	27,500,000
Other Countries	10,900,000	10,000 000	10,000 000
Total	$77,500,000	$86 000,000	$73,500,000
Proportion of silver production	91½ p. c.	92¾ p. c.	92 p. c.

	1875.	1877.	1878.
Total gold & silver	$192 000,000	$197,000,000	$187,500,000

NOTE—The above tables are lu pounds avoirdupois, and sre given so, as the public are more familiar with them. One hundred pounds avordupois is equal to 121⅓ pounds troy—nearly one-fifth added to these above figures, therefore, gives nearly the pounds troy.

The totel emount of gold and silver coin in the world does not exceed $5,500,000,000—$3,000,000,000 for gold and $2.500,000,000 for silvsr, and ths total amount used in the erts, etc., does not exceed $10,000,000,000, so that thers is here a real or apperent loss of $4,500,000,000 or nearly thirty per cent. iu less than four hnndred years. And this tekes no account of the lerge emount of gold and silver in existence at tho time of the discovery ot Americe hy Columbus. It is pertinent, therefore, to ask whet has becoms of all this. —*S. F. Journal of Commerce.*

News in Brief.

THE corn crop in Iowa is said to he the best in years.

THERE is not a single Russieu soldier left in Roumenia.

HALF a dozen sunstrokes occurred in St. Louis last Saturday.

BULLION in the Benk of England decreased £38,000 the past week.

AN earthquake agitated the psopls of Victoria, B. C., July 12th.

THE Bank of Bengal has reduced its rats of discount from 6% to 5%.

THE funeral of the Princs Imperial was en imposing demonstration.

PART of the strikiog colliers at Shemokin, Pe., resumed work yesterday.

A SEVERE earthquake was experienced at Alexandria, Egypt, July 11th.

SPECIE in the Imperial Bank of Germany last week decreased 7,860,000 marks.

FOURTEEN fires occurred in San Francisco from July 3d to the 6th, inclusive.

DURING the past week specie in the Bank of Francs decreased 30,000,000 francs.

GEN. VON MANTEUFEL is to hecome Governor of Alsace-Lorrains in August.

A PARTY of 650 Mormons, en ronte to Salt Lake, have arrived at Council Bluffs.

THE German Reichstag has finelly passed the protective customs tariff—217 to 117.

THERE is 25 feet of snow in Emigrant Gap, near the summit of the Sierra Nsvada.

QUITE a considerable emigration is taking placo from New Eoglaod to Tennessee.

THE recent heavy rains in British Columhia have had a disestrous effect on the crops.

THE Orange procession at Toronto last Saturday was the largest seen there for meny years.

CHINESE-AMERICAN war rages in the shoe shops at North Adams, Mess. Chinamen whip.

PRINCE JEROME BONAPARTE hes virtually assumed the attitude of chief of the Imperialists.

GEN. SIR GARNET WOOLSEY arrived at Cape Town July 15th, and immediately left for Natal.

THE Louisiana State Board of Heelth report that New Orleans wae never healthier than now.

THE French Chamber of Deputies passed the Educational bill yesterday by a vote of 352 to 159.

SERVIA claims 3,000,000 francs from the Porte, on acconnt of Alhanien raids intô Servian territory.

THERE ere over 67,000 Sunday-schools in the country, with an average attendance of 3,000,000 children.

CARDINAL MANNING preached the funeral sermon of the Prince Imperial at Chiselhurst July 13th.

THE total value of etamps, stemped envelopes and postal cards issued during the last year is $29,539,050.

ACCORDING to the new directory of New York, that city has increased 43,000 in population within the past year.

PERU has got a crystallized women. She or it has been sent to England for exhibition in the Westminster aquarium.

IT is reported that Grant has decided not to return until after the Republican nomination for the Presidency is made.

OPERATIONS egainst the Achinese have heen resumed hy the Dutch, four strongholds of the former having been captured.

THE Spanish Minister of Marine declares thet his government has no intention of sending a man-of-war to Chileen waters.

A SON of one of the Siamese twine is echieving high honors in an Eastern college, which leads a funny man to ask, why ehouldn't he rise in the world? His father wes well connected.

THE dissenters from the orthodox church in Russia, hitherto unrecognized hy the State, are to have entire liberty of worship.

AN Arizona dry goode man has, hy proclamation, cut that Territory loose from Sen Francisco. Snipped the apron-string, as it were.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS TO DEWEY & CO.'S MINING AND SCIENTIFIC PRESS PATENT AGENCY.]

By Special Dispatch from Washington. D. C.

FOR THE WEEK ENDING JUNE 24TH, 1879.

216,848.—FIRE-ARM—S T Harrison, San Jose, Cal.
216,743.—COFFIN—R. E. McAlister, S F.
7,432.—COFFER—Trademark—E. Guittard & Co., S. F.

FOR THE WEEK ENDING JULY 1ST, 1879.

217,075.—CRUSHING AND PULVERIZING MILL—J T Davis, San Francisco.
217,096.—GRIPPING DEVICE FOR WIRE-ROPE RAILWAYS—J. Hansen, S. F.
216,956.—VEHICLE SPRING—F. A. Hill, San Leandro, Cal.
217,157.—COMBINED COLLAR AND HAMES—A. Rutherford, Walla Walla, W. T.
217,187.—HORSESHOE—H. G Yates S. F.

FOR THE WEEK ENDING JULY 8TH, 1879.

217,320.—HARROW—N. Beauregard, S. F.
217,365.—GRINDING CAR WHEELS—T. H Gowan, Carson, Nevada.
217,396.—COIN ROLLER—P. H Newhill, Los Angeles.
217,397.—ELECTRICAL CIRCUIT FOR HOTEL ANNUNCIATORS F. Newhoff, S. F.
217,431.—AUTOMATIC SEWER GATE—S. S. Tilton, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Boiler Explosions—No. 4.

[Written for the PRESS by H. W. RICE.]

The explosion of Mr. Anway's boiler, at Rio Vista, a few days ago, adds further proof of the want of skill that is found in the management of these useful servants, threshing engines. The engineer, a man about 50 years of age, on whose countenance is stamped all the appearances of candor and sincerity, swears before a jury that he had one and one-half inches of water in his gauge glass at the time the boiler exploded. If five hundred engineers and experts had sworn to the same thing, the boiler plates will just as positively contradict the statement. It is as plain as daylight that the water was low at the time, and nothing is easier than to see that the plates over the gratos—the hottest place in the boiler—were the first to start downward, and the twisted and torn sheets of iron show the water line, and most positively tell that over 1,400 inches of the crown sheet was bare and hot. The engineer also swore that two days before the explosion he had a pressure, indicated by the gauge, of 105 pounds, and that the gauge at the time of the explosion indicated 85 pounds. The engineer at the time was repairing the lower valve of his pump, which had broken the day previous, and he had drilled a hole through its seat and mended it with a wooden plug and had been trying to work it, and to keep sufficient water in the boiler, which he had failed to do. When the engineer found that his pump was not doing its duty he stopped with his water low, and the steam gauge showed 80 pounds pressure. The fireman closed his damper and waited, but when it was thought to be nearly time to start he put in just two small feeds of straw, the steam quickly arose to 85 pounds, and the explosion occurred. The engine was not moved an inch, and nothing about it or the running gears was in the least injured. Had the boiler been double-riveted and stayed, like the Hoadley's, not a person of those near it would have been left alive to testify. Mr. Anway has owned this engine since 1874. He is not an engineer himself and relies upon the men he employs. During the time he has owned the engine it has always done good service, except, at times, when he has had unskilled or incompetent men. He says that one engineer tested his boiler with live steam at over 160 pounds, and also says that he had not seen water in the gauge glass for four days previous to the explosion. When he asked the engineer the cause, was told by him that the pipes were stopped up.

A close investigation, however, does not show any stoppage in the pipes or the glass. Many cases have come to my knowledge where engineers have deceived their employers by recklessness or perhaps foolishness. In this last-named case the intelligent reader may judge for himself what name to call it, when he stops to think, that a man, claiming to have knowledge sufficient to take care of and operate a steam boiler and engine, does not know better than to try to force water against a pressure of 80 or 90 pounds to the square inch, with a brass valve with its seat made partly of wood,

There are many men, to-day, who are operating engines, who, if their glass was broken or disabled, would not know how to try the water with the common water gauges, and would not know if the water was low, or the plates bare. Last season an old engineer in Contra Costa county broke his glass, and his boiler was so hot that the felting was on fire between the boiler shell and the wood lagging. He bored holes through the wood and had water poured in to put out the fire. He then told the fireman to fire up slowly, and as he started the engino it blew up, He then saw what he might easily have seen before, that his water was at least eight inches low, and that the hot plates were marked with a line which could not be mistaken.

Although it was the cause of serious bodily injury to his fireman and to his reputation as an engineer, yet he did not try to deceive himself or others, but told the plain truth and explained the true cause of the explosion, that it might be a warning and assistance to others.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

REDDING, July 12th, 1879.

MESSRS. DEWEY & CO.—*Gentlemen:*—Have received my letters patent for the bar roller to-day. I am very much obliged to you for your prompt service, and will recommend you to all who may want your assistance.

I remain yours, etc., GEO. MEDINO.

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Chew JACKSON'S BEST Sweet Navy Tobacco

GENERAL MERCHANDISE.

[WHOLESALE.]

WEDNESDAY M., July 14, 1879.

CANDLES.	
Crystal Wax	17 @—
Eagle	12 @—
Patent Sperm	30@—
CANNED GOODS.	
Assorted Pie Fruits, 2½ lb cans	2 25 @ —
Table do	3 50 @ —
Jams and Jellies	3 75 @ —
Pickles, hf gal	3 25 @ —
Sardines, qr box	1 67½@1 90
Hf Boxes	2 50 @2 75
Preserved Beef, 2 lb, doz	4 00 @ —
do Beef, 4 lb, doz	6 50 @ —
Preserved Mutton, 2 lb. doz	4 00 @ —
Beef Tongue	6 50 @ —
Preserved Ham, 2 lb, doz	6 50 @ —
Deviled Ham, 1 lb, doz	5 50 @ —
do Ham, ½ lb, doz	3 00 @ —
COAL—Jobbing.	
Australian, ton	6 00 @ 6 50
Coos Bay	— @ 5 50
Bellingham Bay	— @— —
Seattle	5 50 @ 6 00
Cumberland	12 00 @15 00
Mt Diablo	4 75 @ 6 00
Lehigh	11 50 @12 50
Liverpool	6 00 @ 6 50
West Hartley	— @ 8 00
Scotch	— @ 8 00
Scranton	— @— —
Vancouver Id	6 00 @— —
Charcoal, sack	75 @— —
Coke, bush	60 @— —
COFFEE.	
Sandwich Id, lb	— @— —
Costa Rica	16 @ 17½
Guatemala	16 @ 16½
Java	25 @— 26
Manila	17 @— —
Oreund, in cs	25 @— —
FISH.	
Sac'to Dry Cod	— @ 4
do in cases	5 @ 6
Eastern Cod	7 @— 7½
Salmon, hhls	8 00 @ 9 00
Hf bbls	5 00 @ 5 50
1 lb cans	1 10 @ 1 12½
Pkld Cod, hbls	22 00 @— —
Hf bbls	11 00 @— —
Mackerel, No. 1.	
Hf Bbls	9 50 @10 00
In Kits	1 85 @ 2 10
Ex Mess	3 25 @— —
Pkld Herring, hx	3 00 @ 3 50
Boston Smkd H'g	70 @— —
LIME, Etc.	
Plaster, Golden Gate Mills	3 00 @ 3 25
Land Plaster, tn	10 00 @12 50
Lime, Sta Cruz, bbl	1 25 @ 1 50
Cement, Rosendale	2 00 @ 2 25
Portland	4 00 @ 4 50
NAILS.	
Assorted sizes, keg	2 70 @ 2 75
OILS.	
Pacific Gluo Co's Neatsfoot, No 1	1 00 @ 90
Castor, No 1	1 35 @ —
do, No. 2	1 30 @ —
Baker's A A	1 25 @1 30
Olivo, Plagniol	5 25 @5 75
Possel	4 75 @5 25
Palm, lb	9 @ —
Linseed, Raw, bbl.	78 @ —
Boiled	80 @ —
Cocoanut	55 @ —
China nut, cs	— @ 65
Sperm	1 40 @ —
Coast Whales	— @ 32½
Polar	— @ 35
Lard	— @ 70
Oleophine	22 @ 22½
Devoe's Brilt	17½@ 18
Photolite	— @ —
Nonpariel	31 @ 32½
Eureka	18 @ 42½
Barrel kerosene	20 @ —
Downer Ker	35 @ —
Elaine	37½@ —
PAINTS.	
Pure White Lead	8 @ 8½
Whiting	1¾@ —
Putty	4 @ 5
Chalk	1½@ —
Paris White	2½@ —
Ochre	3½@ —
Venetian Red	3½@ —
Averill Mixed Paint, gal. White & tints	2 00 @2 40
Ocean, Blue & Ch Yellow	3 00 @3 50
Light Red	3 00 @3 50
Metallic Roof	1 30 @1 60
RICE.	
China, Mixed, lb	4¾@ 5
Hawaiian	6 @ —
SALT.	
Cal. Bay, ton	15 00 @22 50
Common	10 00 @12 00
Carmen Id	12 00 @14 00
Liverpool fine	19 00 @— —
SOAP.	
Castile, lb	8 @ 15
Common brands	4½@ 6
Fancy brands	7 @ 8
SPICES.	
Cloves, lb	— @ 45
Cassia	19 @ 20
Nutmegs	85 @ 87½
Pepper Grain	— @ 12
Pimento	19 @ 20
Mustard, Cal., ½ lb glass	— @1 25
SUGAR, ETC.	
Cal. Cube, lb	— @ 10½
Powdered	— @ 10¾
Fine crushed	— @ 10½
Granulated	— @ 10
Golden C	— @ 8½
Cal. Syrup, kgs	70 @ —
Hawaiian Mol'sses	26 @ 30
TEA.	
Young Hyson, Moyune, etc	— @ 51
Country pckd Gunpowder & Imperial	— @ 42½
Hyson	30 @ 35½
Fooo-Chow O	35 @ —
Japan, 1st quality	40 @ —
2d quality	20 @ 25

METALS.

[WHOLESALE.

WEDNESDAY M., July 16, 1879.

IRON.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2¾@ 3½
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 7
Norway, according to thickness	6½@ 7
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @
TIN PLATES.—	
10x14 I O Charcoal	8½@ 9
10x14 I C Coke	7 @ 7½
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft, 7 to 10, lb, less than cask	9½@— 10
NAILS.—	
Assorted sizes	2 90@3 00

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Numa Mining Company.—Principal Place of business, San Francisco, California. Location of works, Humboldt County, Nevada.

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Any stock upon which this assessment shall remain unpaid on the 21st day of July, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 11th day of August, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

DAVID WILDER, Secretary.

Office, 328 Montgomery St., Room 21, San Francisco, Cal.

The Mechanics' Fair Daily.

By authority of the BOARD OF MANAGERS OF THE MECHANICS' INSTITUTE FAIR the publishers of the MINING AND SCIENTIFIC PRESS will issue a large edition of the TENTH VOLUME of the MECHANICS' FAIR DAILY during the FOURTEENTH INDUSTRIAL EXHIBITION, which opens in San Francisco, Tuesday, August 5th, 1879.

It will be of large size, printed and circulated FREE in the Pavilion, and contain the day and evening programme, a list of exhibits, and official bulletin of the Institute.

Its columns will embrace a large variety of important industrial and scientific information, illustrations and well written descriptions of the general features and most deserving and novel exhibits in the Fair, a record of the Fair and incidents of its daily progress—gay, serious and comic—as they occur.

The best of editorial, reportorial and corresponding talent will be employed, with a view to make the paper of live interest in all its departments and of standard value as a full record of the great exhibition, the wonderful inventions, rich resources and rapid progress of our great Western community.

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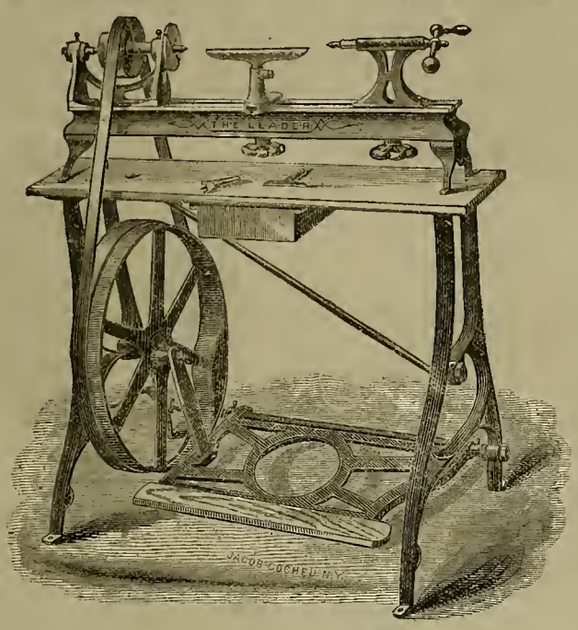

Material eighteen inches long and eight inches in diameter can be turned upon it. The pieces that accompany this Lathe without extra charge are two T rests, two plain centers, one spur center for wood turning, and one face plate.

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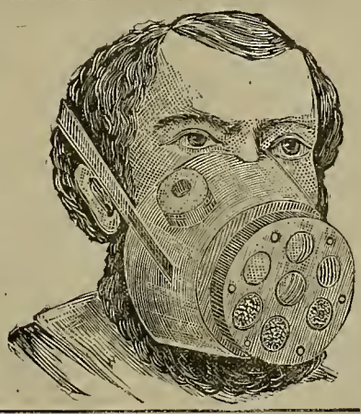

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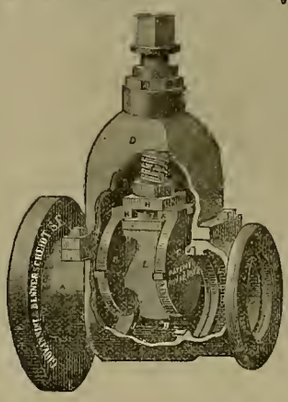

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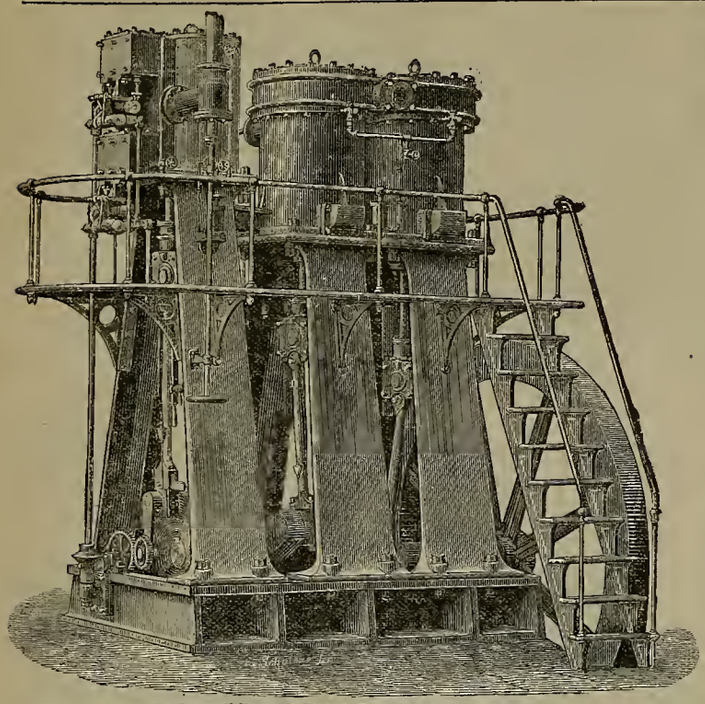

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SAN FRANCISCO, SATURDAY, JULY 26, 1879.

VOLUME XXXIX Number 4.

Mineral Veins.—No. 1.

The importance of a correct theory concerning mineral veins cannot be overestimated, particularly on this coast where prospecting for the precious metals is so common. The absence of proper knowledge has disappointed the hopes of many, who, deceived by small pocket finds or partial strikes, waste their means in the attempt to develop an illusion. In the hope of satisfying many inquiries concerning the apparently controverted subject of mineral veins, we find in Le Conte's "Geology," published by D. Appleton & Co., N. Y., a clear illustration of the system:

All rocks, but especially metamorphic rocks in mountain regions, are seamed and scarred in every direction, as if broken and again mended, as if wounded and again healed. All such seams and scars, of whatever nature and by whatever process formed, are often called by the general name of *veins*. It is better, however, that dikes and so-called granite veins, or all cases of fissures filled at the moment of formation by igneous injection, should be separated from the category of veins. True veins, then, are accumulations, mostly in fissures, of certain mineral matters usually in a purer and more sparry form than they exist in the rocks. The accumulation has in all cases taken place *slowly*.

Thus limited, veins are of three kinds. *Veins of segregation, veins of infiltration* and great *fissure veins*. These three, however, graduate into each other in such wise that it is often difficult to determine to which we must refer any particular case. Some writers make many other kinds.

In veins of segregation the vein matter does not differ greatly from the inclosing rock. Such are the irregular lines of granite in granite, the lines differing from the inclosing rock only in color or texture; also irregular veins of feldspar in granite or in gneiss. Under the same head belong also the irregular streaks, clouds and blotches, so common in marble. In these cases there seems to be no distinct line of separation between the vein and the inclosing rock—*no distinct wall to the vein*. The reason is, these veins are not formed by the filling of a previously existing fissure, but by the segregation of certain materials, in certain spots and along certain lines, from the general mass of the rock, either when the latter was in plastic condition from heat and water, or else by means of percolating water, somewhat as *concretions* of lime, clay, iron ore and flint, are formed in the strata.

Veins of infiltration originate in metamorphic rocks which have probably been subjected to powerful horizontal pressure. Besides the wide folds into which such rocks are thus thrown and the great fissures thus produced, the strata are often broken into small pieces by means of the squeezing and crushing. The small fissures thus produced are often filled by *lateral secretion* from the walls, or else by slowly percolating waters holding in solution the more soluble matters contained in the rocks. The process is similar to the filling of cavities left by imbedded organisms, and still more to the filling of air blebs in traps and lavas, and the formation of agates and carnelian amygdules. In veins of this kind, therefore, a beautiful *ribbon structure* is often produced by the successive deposition of different colored materials on the walls of the fissure. Veins of this kind also, since they are the filling of a previously existing fissure, have *distinct walls*. The filling consists most commonly of silica or of carbonate of lime.

Fissure veins are fillings of the great fissures produced by movements of the earth's crust. When these fissures are filled at the time of formation by igneous injection they are called *dikes;* but if subsequently with mineral matter, by a different process, to be discussed hereafter, they are *fissure veins*. These veins, therefore, like dikes, outcrop over the surface of the country often for many miles, 50 or more. Like dikes also they are often many yards in width, and extend to unknown but certainly very great depths. Like dikes and fissures also they occur in parallel systems.

The most obvious characteristics of the veins of this class are their size, their continuity for great distances and to great depths, and their occurrence in parallel systems. As the vein is a filling of a previously existing fissure, the distinction between the vein and the wall-rock is usually quite marked. In many cases, in fact, the vein-filling is separated from the wall-rock by a layer of earthy or clayey matter called a *selvage*, as if the sides of the open fissure had become foul by percolating waters carrying clay, before the fissure was filled with mineral matter. The contents of fissures veins are also far more varied than those of other classes.

Although more regular than other kinds, yet fissure veins are also often quite irregular—sometimes branching, sometimes narrowing or pinching out in some parts and widening in others (Fig. 1), sometimes dividing and again coming together, and thus inclosing a portion of the wall-rock (Fig. 2). Such an inclosed mass of country rock in the midst of a vein is called a "*horse*." Many of these irregularities

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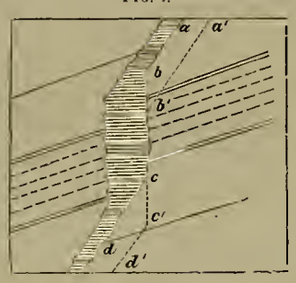

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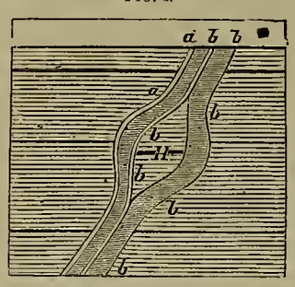

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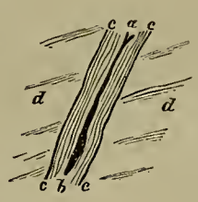

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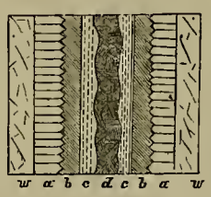

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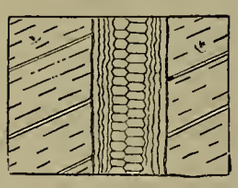

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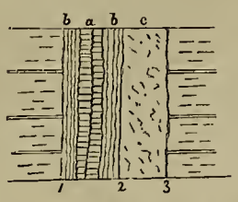

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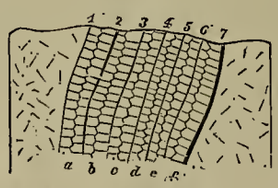

THEORY OF MINERAL VEINS, ILLUSTRATED.

are probably the result of movements after the fissure was formed, or even after it was filled. Thus, if *a b c d* (Fig. 1) be one wall of an irregular vein, then it is probable that *a' b' c' d'* was the original position of this wall; but, before it was filled, it slipped up to its present position. Again, movements may reopen a fissure after it is filled. In such cases, if the adhesion of the filling to the wall is strong, portions of the wall-rock are torn away; and if a second filling takes place, a "horse" is formed. Thus *a a a* and *b b b* (Fig. 2) represent the two original walls of an irregular vein; but subsequent movement reopened the fissure to *b' b' b'* and tore away the horse *H*, after which the vein was again filled.

Veins, of course, usually intersect the strata; but in some cases where strata-planes, or else cleavage-planes, are highly inclined, the opening is between these planes, and the veins are, therefore, conformable with them.

Some metals, particularly iron, occur principally in great beds, being accumulated by a process already described. Others, especially lead, often accumulate in flat cavities between the strata, especially of limestone. But most metals occur in veins. All the kinds of veins mentioned above may contain metals, but the segregative veins are usually too irregular and uncertain, and the infiltrative veins too small, to be profitable. True, profitable metalliferous veins are almost always great fissure veins.

The contents of metalliferous veins are of two general kinds, viz., *vein-stuffs* and *ores*. The principal vein-stuffs are quartz, carbonate of lime (calc-spar), carbonate of baryta, carbonate of iron, sulphate of baryta (heavy spar), and fluoride of calcium (fluor-spar). By far the most common of these is quartz, and next is calc-spar. Often, however, the vein-stuff is an aggregate of minerals forming a true rock. Nearly the whole of a vein consists usually of vein-stuff. The ore exists in comparatively small quantities, sometimes forming a central rib or sheet, as is deposited last (Fig. 3); sometimes in irregular isolated masses called bunches or pockets, or in small strings, or grains, irregularly scattered through the vein-stuff and extending often a little way into the wall-rock.

The chemical forms in which metals occur are very various; sometimes they occur as pure metal (as always in the case of gold and platinum, and sometimes in the case of silver and copper), but more commonly in the form of metallic sulphides, metallic oxides and metallic carbonates. Of these the metallic sulphides are by far the most common. It is worthy of remark that all these forms are comparatively very insoluble. The same is true of the vein-stuffs.

The ribboned or banded structure, already spoken of under veins of infiltration, is very commonly found in great fissure veins. This structure is as characteristic of veins as the columnar structure is of dikes. The layers on the two sides usually correspond to each other; sometimes the successive layers are of different color, giving rise to a beautiful, striped appearance. Sometimes the successive layers on both sides are of different materials, as in Fig. 4, in which the central rib, *d*, is galena, and *a a*, *b b*, *c c*, are successive layers of quartz, fluor and baryta. Sometimes, in cases of quartz-filling, the layers are agate, except the center, which is filled up with a comb of interlocking crystals, as in Fig. 5. The same occurs often in amygdules, the last filling being crystallins. Sometimes there is evidence of successive openings and fillings, as in Fig. 6, where *a* represents quartz crystals, interlocking in the center and based on agate layers, *b b*, while *c* represents quartz with disseminated copper pyrites. In this case it seems probable that 1 and 2 were the walls when the agate and quartz filling took place, and that afterward the fissure was reopened along 2, so that the walls became 2 and 3, and the new fissure thus formed was filled with cuprifarous quartz. The same is well shown in Fig. 7, where *a, b, c, d, e, f*, are successive quartz combs, separated by 2, 3, 4, 5, 6, which are clay selvages, and therefore old walls.

The relative age of veins in the same region is determined in the same way as that of dikes, viz., by the manner in which they intersect each other; the intersecting vein being, of course, younger than the intersected vein.

The absolute age of fissure veins, or the geological period in which the fissure was formed, can only be determined by the stratified rocks through which it breaks. The auriferous veins of California break through the Jurassic; and, as there are good reasons for believing that the Sierras were formed at the end of the Jurassic, it is probable that these fissures were formed at that time, by the foldings of the strata consequent upon the pushing up of this range. The filling, of course, was a slow, subsequent operation, but commenced then.

Mineral veins seldom or never outcrop on the surface in the condition we have described them. On the contrary, there are certain changes which they undergo through the influence of atmospheric agencies, which render their appearance along their outcrop quite different from that of the same vein at some depth below. A knowledge of these changes is, of course, of the greatest practical importance. They are, however, extremely various, differing not only according to the metallic contents, but also according to the nature of the vein-stuffs, and therefore must be learned by observation in each country.

Gold is found either in quartz veins intersecting metamorphic slates (quartz mines) or in gravel drifts in the vicinity of these (placer mines). Originally it existed in the quartz veins usually associated with metallic sulphides, particularly the sulphide of iron (pyrites). If the pyrites be dissolved in nitric acid, the gold is left as minute threads and crystals. Evidently, therefore, it exists in minute threads and crystals scattered through the pyrites. Now, when such a vein is exposed to meteoric agencies, the pyrites are oxidized, partly as soluble sulphate, and carried away, and partly as insoluble reddish peroxide, which remains. The quartz-vein stone is, therefore, left in a honey-comb condition by the removal of the pyrites, and more commonly stained of a rusty color by the peroxide. Among the cells of this rusty, cellular quartz the gold is found in minute, sharp grains, evidently left by the removal of the pyrites. Hence, in an auriferous quartz vein, along the outcrop to a depth of 30 to 60 feet (*i. e.*, as far as meteoric agencies extend), gold is found free in small grains among the cellular quartz; but below the reach of these agencies it is inclosed in the undecomposed pyrites.

If a mountain slope, along which outcrop auriferous quartz veins, be subjected to powerful erosion by water currents, then in the stream beds will be found gravel drifts, composed partly of the country rock and partly of the quartz vein stone. Among the gravel will be found particles of gold, washed out from the upper parts of the veins. By the sorting power of water the heavy gold particles are apt to accumulate mostly near the bed of the gravel deposit (bedrock). These gravel deposits are the placers. In these the gold particles, like the stone fragments, are always rounded and worn by attrition.

A MINER at Big Oak Flat, Nevada county, Cal., is prospecting a placer mine by boring a 4½-inch hole. He cuts through any rocks, even the hardest quartz boulders. Fifty feet in nine hours is his average. With the auger used he brings up the gravel and all it contains from any point.

THE bullion shipments from Bodie district from July 1st to 20th amounted to $147,846.21.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS

Developments on Silver Hill, Bodie.

EDITORS PRESS:—The interests of Bodie are being rapidly extended to the southeast of the ground on which are located the Bodie, Standard, etc., properties which have formerly held almost undivided attention. Now we find the ground all about Silver hill rapidly opening out and exhibiting its rich interior. In addition to the Noonday, Booker, Red Cloud and others which are now contributing largely to the milling interests, we find many smaller shafts, whose future, as indicated by the surrounding developments, bids fair of an equal success. I had occasion to investigate the prospects of one of these opening fortunes through the invitation of Mr. McMurry, Superintendent of the Glory. This claim, it is supposed, possesses the continuation of the South Noonday ledge, which has already proved itself valuable. The Glory is nearly adjacent to the Booker and lies next to the Noonday proper, thus environed by valuable mines. The shaft is down 30 feet and now holds a ledge twenty inches in thickness. This ledge is formed by the conjunction of two ledges separate on the surface, and the contents consist of the kind of gold-bearing quartz characteristic of the district. The property was recently surveyed, mapped and a company incorporated with the usual capital stock of 100,000 shares. Mr. McMurry heads operations at present, and the progress is admirable under his supervision. This is one of the many on the same hill, and we may expect shortly to see surprising developments from this hill, as well as farther over in the same direction.

A Glimpse of the Town of Bodie.

To give anything of a reasonable estimate of the population of the growing town of Bodie is rendered impossible by the transient character of its residents; it might now be put at 7,000, and next month, 8,000. As is usually the case with such rapidly growing towns, there is a Main street in the immediate vicinity of which are all the buildings of the town. Imagine a very sterile valley between moderate ranges, with a trend to the north of east; a street running through its lowest part, and, to conform to a partial bend in the valley, changing direction about 10°; bright new wooden houses lining the street closely on both sides, and the property in the rear of these checkered over with a few miner's shanties and shops, and we have the town as it now stands. The mountains on the southwest contain the mineral ledges, and are covered with ore dumps and hoisting works which give it a speckled appearance to the distant observer. The miner, in looking at these, points out a pile, and remarks: "There is a brownish dump whose color indicates the presence of gold;" pointing to another dump of a bluish white color, he remarks: "There is evidence either of silver ore or none at all." In these we have the two distinct, noticeable colors of dirt turned out. All of the country within 20 miles is perfectly barren, with the exception of a low sage brush, which fastens itself into the rocks, and seems to ho barely eking out an existence.

The great influx of people arrive by two routes, one from Carson entering at the eastern end of the valley, and the other, on the Pioneer stage line, from Milton by Sonora, entering by the west end. This keeps the town growing in both directions; the eastern end, however, labors under a decided disadvantage inasmuch as the Chinese and disreputable classes have taken up their abode here, and their influence is demoralizing, with a tendency to lower the value of property, and to check the erection of the better class of business houses.

Every variety of business proper seems to flourish; as to the kind of business which predominates, we may say that of every three houses, the first will be a restaurant, the second a saloon, and the third may be occupied by a tinman, a shoemaker, a fruit vender, meat man or barber. The lumber business is an unusually brisk one, and is managed by two firms. The vocation of hoothlack here fails entirely, the hardy miner needing no polish for his cabin associate or "pard" to admire. Blacksmiths flourish, and the painter soon becomes independent, the houses all being new and waiting to receive the protecting and beautifying coat. Three active papers furnish ample reading matter for the busy population, and nothing could well be added to this branch. One small schoolhouse furnishes all the instruction given to the numerous children, and its tiny bell is the only ring which announces a Christian service, and that seldom more than once per week. This should astonish a Christain people, and the dwellers of Bodie, we hope, will not long remain so utterly destitute of the life-giving truth and instruction.

Investigation shows that the greatest wants are felt in the way of a good foundry and custom stamp mills adequate for crushing the thousands of tons of ore now lying on the dumps of mines whose finances cannot at present furnish funds for the erection of private mills. No investment could be made so profitable as one to furnish custom stamp mills or an iron foundry. Imagine all the worn-out drills, dies, shoes and milling machinery employed in a mining camp being replaced by metal brought in under a freight of three and one-half cents per pound! The town must have stamp mills and it must have a foundry.

For amusement, there are two halls, termed theaters, where amateurs occasionally perform; but the miner feels no want in this department, as his cabin bed is the most acceptable enjoyment for tired limbs and exhausted body. A town crier, bell in hand, with a stentorian voice, proclaims a gathering of the people when there is occasion for an assembly. At evening the street is fairly alive with people passing to and fro—the exclamation is: "Where do they all live!" Nor is there a want of life at midday, the place having about double the number of laborers required for the mines, and here they loiter around waiting for something to turn up. They ride into the place and frequently walk out, minus what little money they happened to bring.

By strict economy one can live here as cheap as in San Francisco; the contrary of what we should expect of a mining town; but it is a fact, surprising as it may seem. All the luxuries of a San Francisco market may be here enjoyed, everything being freighted from Carson City by large prairie schooners, hauled each by twenty or thirty mules or oxen. These teams may be seen resting in the few side streets, and the oxen lying down present a picturesque appearance, representing "rest from toil." The elderly Piute Indian roams about the town, picking up scraps and rags from the street, while the children and women, with their faces painted and marked hideously, frolic with their dogs or amuse themselves with their rude games. Taking it all in all there cannot be a more stirring people in the State than those whom we find here in Bodie, it being the very essence of life. JNO. H. WHEELER.

Bodie, July 17th.

Mines and Mining in Tuolumne County.

EDITORS PRESS:—There is greater activity in quartz mining throughout this county at the present time than has been observable for 10 years past, when the business first began to undergo a decline. This decline was due to the usual causes, such as general high prices, extravagance, mismanagement, arising from ignorance and inexperience, to which should be added, as having been here fearfully prevalent, a general lack of thrift and dislike of hard work. Prior to 1869, when only a few of the richer surface ore deposits and pockets, like those on Bald mountain, in Big canyon, at Rawhide ranch, and a few other points on the mother lode, were worked, the results proved satisfactory enough. Afterwards, when deeper exploration became necessary, when these rich pockets were exhausted and lower grade, and sometimes more obstinate ores had to be dealt with, then these pioneer quartz miners, with their big ideas and lack of practical knowledge, soon became discouraged and one after another retired from the field, leaving their claims unworked and the mills standing idle. And thus it was that for the next decade the bullion product and population of Tuolumne gradually decreased and, a blight having come over this branch of mining, all her other industries suffered. And this, not that she had been denied the assistance of capital or really lacked reduction works. Both had been supplied to her liberally. Shafts had been sunk and tunnels run, hoisting works had been erected, and, as we have seen, many mills put up. But it did not avail,

And Wherefore?

How happened it that with all this aid, with all needed appliances and with as good quartz veins as can be found anywhere in California, that this branch of mining has here turned out so badly and been so neglected? The answer is, it was because we had not here the right kind of miners and the right kind of population generally. This section of the State was, as is well known, settled largely by Mexicans and immigrants from Texas and other sections of the Southwest, who naturally drifted in here on their first arrival in the country, many of the more reckless and adventurous having also been originally attracted to this vicinity by the extremely rich character of the surface deposits, for which the mines here were noted. After these deposits had become so far exhausted that hard work, skill and economy were required to make mining pay, these were not the kind of men to render the business a success. These were habits to which these free-and-easy-going people had not been accustomed, virtues that they knew nothing about and which they could not be made to practice. Hence the stagnation and failure, the idle mills, deserted mines, and the general disasters that for so long a time has attended quartz mining here as well also as in some of the counties farther south. It is true we have here even among the pioneer residents some hard-working, frugal men and good miners, but they are in the minority—only as one to two or three of the indolent and thriftless, who, through their preponderance have not only greatly obstructed this branch of mining, but so impressed their characteristics upon the business that it will require yet another decade to work their entire elimination.

A New and Better Element

Has, within the present year, begun to arrive in old Tuolumne. Trained miners, practiced in the details of the business, capable millmen, metallurgists and assayers have been dropping in upon us, coming sometimes on their own account, and again as the representatives of capitalists—shrewd men conversant with the resources and advantages of the county, and knowing well the obstacles it has had to contend with. Looking about, these miners and assayers have got hold of a number of good properties, buying, in some cases, mines already taken up and partially opened by the incompetents, and in others prospecting for, finding and locating claims, and going to work on them. In adopting the latter course, the skillful assayer has this advantage over the ordinary miner: he is able to know all the while just what the ore he meets with is worth, and also pretty nearly what method will be best adapted for its treatment. For example, this, the old Garrote district, where mining had before greatly languished, has within the past few months been started into new life, simply through the more intelligent methods of prospecting introduced here by men better acquainted with the science of the business, and holding generally more advanced ideas of vein mining than the old crop of prospectors.

The Spring Mine—A New and Important Discovery.

Striking across the country here in an easterly and westerly direction, is to be seen a long and well-defined range of auriferous quartz croppings. These croppings, which can be traced for several miles, appearing at points in great strength, hold their course without variation, indicating the presence of a powerful lode below. Although many claims were located along this range years ago, none of them have ever been much developed. Of late but little attention has been paid to them, this neglect amounting in most cases to an actual abandonment. A few months since there came to this place a young man skilled in metallurgy and assaying, and, in fact, well up in every branch of mining. Observing these neglected but promising mineral indications, he proceeded to examine them more closely, and having obtained a good showing of gold, took up, in connection with two other young men, residents of the place, a company location. Though their means were limited these parties have since developed their claim sufficiently to establish for it a large value. The ore, which is free milling, clean and easily treated, has improved steadily from the surface downward. On ton crushings indicated for it a milling value of not more than $6 or $8 per ton, at a depth of 20 feet the grade had advanced to $12, and since to about $14 per ton. The drifting and crosscutting, of which a considerable amount has been done, show a body of ore 10 feet wide, reaching as far as excavations have been extended. The lining and other features of the lode, the geology of the formation, and, in short, all the conditions point to the existence here of such heavy, persistent and high-grade ore deposits as will constitute to find a first-class gold mine.

The Effect.

The occurrence of this strike in the Spring mine has stirred up the old prospectors here, and, in fact, tended to animate the entire business of quartz mining in a wonderful manner. The abandoned claims have been re-located and work started on many of the live ones, ore searching having been stimulated also in the country outside. Some of the claims lately opened up on this promising ore range are looking well—notably so the Young Pine, near its easterly end, and from which in years agone a good deal of gold was taken; also the Black Hawk, once somewhat developed but suffered afterwards to fall into a state of decay. Work on the Mount Jefferson mine, situated on a parallel ledge lying quarter of a mile to the north, is also being pushed now with vigor and with every prospect that a valuable ore body will soon be opened up there. This company has a splendid property, and, although this too has suffered from bad management in times past, its future is now altogether promising. There are several other mines in this vicinity that present an encouraging outlook and from which a good account may be expected. The Golden Rock company, piping to the east of Big Oak flat, are having a prosperous run this season. They play 1,500 inches in two streams under a 40-foot pressure and wash out about $200 for each running day. X.

Groveland, July 12th, 1879.

ARTIFICIAL ULTRAMARINE.—This product has almost wholly supplanted the cobalt dyes, and it has largely taken the place of Prussian and other blues. In 1862 the total production was 3,556 tons; in 1872 it had risen to 8,585 tons, exclusive of the amounts manufactured in an English and in an American factory. The present product is probably over 12,000 tons. The materials employed in the manufacture are sulphide sodium, sulphate and carbonate of soda, sulphur, carbon and silicates of alumina.—*La Gaceta Indust.*

ARTIFICIAL IMITATION OF NATIVE IRON.—S. Meunier has confirmed his theory in regard to the terrestrial origin of the supposed meteoric native iron of Greenland, by the action of protochloride of iron and chloride of nickel upon fragments of iron in a porcelain tube. He thus obtained a fac-simile, upon a microscopic scale, of the huge blocks which were brought from Disco by M. Nordenskjold.—*Comptes Rendus.*

Recent Patent Decision.

A case of some importance to the oil stove trade, and of great interest to manufacturers generally as an interpretation of the patent law, has just been decided in the Circuit Court of the United States for the Southern District of New York, by Judge Blatchford. Messrs. C. Riessner & Co., assignees of a patent for improvements in oil stoves, granted to John A. Frey, October 20th, 1874, and reissued June 19th, 1877, brought suit against James L. Sharp for a preliminary injunction. The plaintiffs were represented by Benjamin F. Lee and the defendant by Arthur V. Briesen. Judge Blatchford, in his decision rendered June 7th, denied the motion for an injunction. It seems that Frey assigned to James Henry Thorp the right of obtaining the patent for the Dominion of Canada, which was granted on the 15th of May, 1873, previous to the application for and the granting of a patent on October 20th, 1874, to Frey for the United States. In his reissue of June 19th, 1877, Frey claims as his invention a coal-oil stove called the "Summer Queen," having its wick wheels, wick-wheel shafts and the entire upper surface of its oil reservoir covered by a water reservoir, which protects it, together with a combination of the cap and chimney. The drawing and description of the Canadian patent shows and describes as the first part of the invention what is also described as part of the invention in the United States reissue, which must be regarded as having superseded the original patent.

The United States patent law provides that the American patent expires at the same time as the foreign one taken previous to it, and, as a patent is granted in Canada for five years, it was held that the American patent must expire with it on the 15th of May, 1878. Against this view it was urged by plaintiffs that the extensions granted to the patentee for Canada, for a term of five and ten years, under the provisions of the Canadian law, in March, 1878, would make the American patent run until the Canada patent expires under its extensions; namely, until May 15th, 1888.

The language of the statute, it was said, extended not only to the term of the foreign patent in force when the United States patent was granted, but also the term of any prolongation which the patentee might obtain from the foreign government. The court held, quoting the decission of Judge Clifford in the case of Henry *vs.* the Providence Tool Company, that the foreign patent cannot be held to include any subsequent prolongation or extension of the monopoly beyond that vested in the foreign patent at the time of granting of the United States patent. This is an important point, as it limits United States patents, granted after a Canada patent has been taken out for the same invention, to five years only, irrespective of any extension which may be obtained in Canada after the American patent has been secured. This point was decided by Judge Blatchford aside from the fact, applicable to this special case, that the defendants had put in a plea to the bill and the plaintiff had set down such plea for argument before the Canada extensions were granted.

NEW SPECTROMETER.—John W. Draper, M. D., President of the Faculty of Science in the University of New York, has invented a spectrometer which will open a new and interesting field to those engaged in the study of spectrum analysis. The ordinary spectroscope is occupied with the frequency of ether-vibrations or wave-length, while Dr. Draper's deals with the intensity or brilliancy of light, and depends on the optical principle that a light becomes invisible when in presence of another light about 64 times more brilliant. The general conclusions of experiments are that in the prismatic spectrum the luminous density increases from the more to the less refrangible spaces, its maximum being not in the yellow but in the red. In the grating or diffraction spectrum the luminous intensity is equal in all the visible regions, all the colors being simultaneously obliterated by an extinguishing light.

MICROPHONIC STUDY.—Boudet de Paris has experimented with a microphonic transmitter, in which the carbons, instead of being pressed by a spring, are simply kept in contact by a bit of paper folded like a V. It was so sensitive that, with a single Leclanche cell, and at a distance of 500 meters (1,640.4 feet), the receiving telephone reproduced the message so that it could be heard in all parts of the hall. By increasing the amplitude of the vibrations he found that they were of two kinds: 1. Large vibrations, or rather undulations, which always occurred in the same order for any given word or vowel. 2. Small vibrations, very short, very numerous, looped upon the larger ones. He thinks that the undulations are due either to the force of the breath which necessarily accompanies the emission of the voice, or to the inertia of the instrument.—*Comptes Rendus.*

COMPARATIVE STRENGTH OF WOOD AND IRON. Heim finds that, in most cases, a uniform strength of structure can be more economically secured by the use of wood than by the use of iron. The strength of wood is proportioned to its density, and can be increased by its immersion for two or three days, or until complete saturation, in linseed oil, kept at a temperature of from 150° to 212° Fahr.—*Fortschr. der Zeit.*

MECHANICAL PROGRESS.

Transmission of Power by Shafting.

A simple and ingenious arrangement for the transmission of power by shafting has been proposed by Herr Wilhelm Ritter, of Altona, Germany. In order to transmit the motion and power of a shaft, fitted in bearings to one or more shafts, he proposed to place a box or bracket over one of the ends of the motive power shaft, to the outer end of which he fastens a conical wheel. The outer angle of the bracket is likewise formed as a box, the outer part of the boring being enlarged for the reception of a cylindrical prolongation of a similar bracket. It is furnished with a set-screw to secure the second bracket, which can be turned within the enlarged boring of the first one in any desired position of a circle. A short axle passes through the box of the second bracket, the corresponding projection and the box of the first bracket, and to each end of this short axle a conical wheel is attached. One of these wheels is in gear with the wheel of the motive power shaft, while the other conical wheel is in gear with a similar wheel fastened to the end of a shaft that revolves in the boring of the other box of the second bracket. The shaft of the second bracket is thus put in motion, and the axis of the shaft can be turned into any position within the plane of a circle, after loosening the set-screw and turning the second bracket in the boring of the first one. When the shaft of the second bracket has been adjusted, the position of the two brackets to each other is secured by means of the set-screw. Two additional pairs of conical wheels, two other angle brackets of like construction and connection, and another short axle, will transmit the power to a third shaft, and by this means motion and power can be continued to other shafts, the last of which may be constructed for the reception of a tool, or a pulley may be placed on this shaft for driving a tool or implement.

COMMUNICATIONS WITH LIGHTHOUSES.—A new description of rocket, called the "buoyant rocket," has been produced by the Royal Laboratory Department, at the request of the Board of Trade. A rocket was required as a means of communication between the shore and lighthouses a few hundred yards from the main land during bad weather, and in circumstances under which the ordinary life-saving rock apparatus by which a line is conveyed to a wrecked vessel would be unavailable. The Laboratory have answered the demand by adopting the old-fashioned Congreve rocket to meet the required end. A small iron tube containing the composition is enclosed in a casing of cork, and fitted to a stick in primitive fashion, with a line made fast to the extremity, and the simple arrangement has admirably succeeded. Three of the rockets have been tried at Shoeburyness, being fired from a trough at the surface of the sea, and plowing a direct course through the water with a strong line attached, by means of which an assistant or a boatload of provisions could be conveyed to the lighthouse keeper.

A VERY SIMPLE PANTAGRAPH.—Schnaus suggests the use of a fine rubber cord, about 15 inches long, supplied with a loop at each end, and having on it a small white bead, sliding on it with gentle friction. By securing one end to the table by a pin, and passing a pencil through the other end, and drawing its point over the paper with the right hand keeping the string stretched, and causing the bead to describe the outline of a simple drawing placed beneath it, a tolerably good copy of the drawing will be produced, bearing any desired proportion to the original, according to the position given to the bead on the string; thus, if the bead is in the center of the cord, the drawing will be double the size of the original. The best results are only obtainable after some practice, and by employing a finer point than a bead.

BOLLEE'S STEAM CARRIAGES.—These carriages carry in the rear a Field boiler, and forward, two steam cylinders enclosed in a strong box to protect them against dust. Motion is transmitted by conical gearing to an intermediate shaft, from which the driving wheels are actuated through the medium of chains. Both driving wheels are independent. The carriage is suspended from very long and flexible springs. The front wheels are without springs, each pivoting about its vertical axle like the wheel of a velocipede. On a level road this carriage is stated to travel at a rate of 15 miles an hour, the greatest speed yet made being 25 miles. It is said to be capable of turning curves of 7-foot radius. It is considered in France an important improvement, as it uses only from 2 to 7 pounds of coal per hour, and weighs only 6,500 pounds.

RECORDING THERMOGRAPH.—An ingenious arrangement, capable of being utilized for recording the temperature of mines, has been patented by Mr. Bowkett, of the Leeds Fever Hospital. It consists of a hollow tube similar to that in the Bourdon pressure-gauge bent into a semicircle and filled with a suitable fluid, one end hermetically sealed, the free arm of the other operating a lead-pencil which marks on a dial, moved by clock-work, and which is divided by radii into hours, and provided with concentric circles for indicating the range of expansion and contraction.

PREPARING CARBONS FOR THE ELECTRIC LIGHT.—Prof. H. W. Wiley, of the Purdue University, Lafayette, Ind., in the *American Journal of Science*, says that he found that the American carbons, having a density of only 1.55, against 1.85 for the French, were soft, and were rapidly consumed when used in an electric lamp. He coated them with copper to increase their durability, and tried the expedient of setting a copper wire in the center of the carbons, by which means, it is true, he obtained a steady light, but did not succeed in diminishing the rate of wear. Believing that a way could be devised of protecting the copper coating from oxidation, he tried covering the carbons, after copper-plating, with a film of plaster of Paris about 0.04 inch in thickness. After this had set, the edge of the carbon, which was to be turned toward the condenser, was carefully denuded of its plaster covering, which was also cut away until quite thin on the adjacent surfaces. These precautions were taken so that the plaster might not interfere with the radiation of light in the direction of the condenser. Before use, the plaster must be thoroughly and slowly dried. The copper surface at the end of the carbon being uncovered, it is fastened in the holder in the usual way. The carbons prepared in the way described left nothing to be desired. The light was steady, and the carbons burned slowly away. The film of plaster melted gradually as the point was consumed, and thus never interfered with the illumination. The points of both positive and negative carbons remained blunt, and there was no wasting away of the stem. A carbon prepared in this way will, according to Prof. Wiley, last at least ten times as long as one used in the ordinary way. Its chief advantage, however, is found in the comparative steadiness of the light thus secured.

WIND GAUGE.—A simple apparatus for continuously recording the direction of the wind, constructed by M. Redier, is now in use at the observatory at Lyons. A weathercock of suitable form is supported by a sort of tripod of grooved wheels running upon a circular rail of steel (the wheels having individually a horizontal axis, but collectively a vertical). From the weathercock passes down a vertical rod to connection with a cylinder (placed with axis vertical), which is supported below by a steel pivot resting on a plate of agate, and is guided at the upper part by horizontal pulleys. Thus each movement of the weathercock is transmitted to the cylinder. The latter has wound round it a sheet of paper, graduated vertically and horizontally (the vertical divisions representing the hours, the horizontal the directions), and a pencil applied to the paper is moved in vertical directions by clock-work. It will thus be seen that the tracing obtained on the paper indicates the successive positions taken by the weathercock, and, accordingly, the direction of the wind for any given time.

A VOLTAIC PENCIL.—*Le Technologiste* gives the following description of an instrument which seems to be an improvement on Edison's electric pen: "It is to M. Bellet, a Parisian, that we owe the invention of the voltaic pencil, which perforates the paper in the same manner that it is pierced by Edison's electric pen, but without the intervention of the needle vibrated by a little electro-motor. Instead of actuating a needle as in the ordinary pricking machines used by those who design laces, embroideries, etc., the electric current itself passes through the paper; for, as is well known, the lead of a pencil is a good conductor. This arrangement is advantageous in that the artist sees the traces of his work, his method of working being in no way different from the one which he habitually uses. But more than this, by means of this voltaic pencil, so skillfully perfected by its inventor, the artist, by drawing directly upon the lithographic stone or the metal plate, can now dispense with the services of the engraver, who so often denaturalizes the artist's work."

ELECTRIC INSCRIPTION OF WORDS.—The transmitting apparatus is a microphonic speaker, the carbons of which instead of being pressed by a spring, are simply maintained in contact by the pressure of a small piece of paper folded in the form of a V. The vibrations of the diaphragm of the receiving apparatus cannot be written, since the movements of the style, however delicate the apparatus, can scarcely be distinguished upon the lamp-black. To enlarge the magnetic vibrations of the receiver the cover and the diaphragm of a Bell's telephone are taken away, and on the wood of the instrument there is fixed the end of a small, stiff steel spring. The other end of the spring abuts on the surface of the magnetic nucleus surrounded by its coil; to this extremity is soldered a small mass of soft iron, weighing about 10 grms., and upon this mass and in the produced line of the axis of the spring is fixed a light style of bamboo, 10 centimeters in length and terminating in a slender whale-bone pen.—*M. Boudet.*

A KNOWING ENGINE.—A new automatic pumping engine is in operation at the Providence (R. I.) Water Works. It has 10 cylinders, 5 for water and 5 for steam, arranged alternately in a circle. It possesses an enormous capacity, but it will, without attention from the attendant, do the duty of pumping either for a single faucet or for a dozen steam fire engines. The cylinders are all connected to a single central upright shaft, which automatically either makes 1 revolution in 5 minutes or 25 in 1 minute, according to water required. If the fire burns low the engine will open the damper. If this is not sufficient it will put on the blower.

SCIENTIFIC PROGRESS.

Photography on Wood.

T. C. Harris, in *Practical Photographer*, says: The many published formulæ for photographing on wood are nearly all defective because the block becomes wet during the operation. This is a vital point. Mr. Harris presents two ways of printing on wood which give good results, and do not damage the block in the least. From a negative of the subject desired, make a clear, thin positive on glass, by the wet collodian process. The positive should be of the proper size, on clean glass, without substratum. Tone and fix as a transparency, and lay in a dish of water containing a small percentage of sulphuric acid, to loosen the film. The film will soon become so loose that it can be easily stripped from the glass and transformed to the block. To do this, lay on the film a piece of wet albumenized paper a little larger than the glass. Press out the bubbles and surplus water carefully, then turn back one corner of the paper, and it will come off, bringing the film with it. Have the block smoothly whitened with Chinese white in gum water, and the surface slightly damp. It is now easy to transfer the film to the wood and remove the paper, when the block must be allowed to dry spontaneously.

Another way to print on wood is by a sort of photo-lithograph process. Coat paper with a thin, uniform coat of gelatine in warm water. Dry, and float a short time on a weak solution of bichromate of potash in water. Dry again, and expose under a negative till all the details are visible. Now roll the entire surface of the print with a printer's roller charged with lithographic transfer ink thinned with spirits of turpentine. Now soak the paper in a dish of tepid or warm water until the ink can be removed, by rubbing gently with a small sponge. All the ink, except the lines composing the picture, can be removed, when the print should be laid face down on the whitened block, and subjected to a heavy pressure in a common letter-press. The paper can be easily removed by wetting the back.

Another application of photography as a help to the engraver was discovered by the writer. Procure hard rubber, in smooth, black, polished sheets of about one-eighth of an inch in thickness. These are to be cut to the proper size, cleaned and albumenized the same as glass for negatives. The rubber plate is covered with collodian, sensitized in the bath, exposed in the camera, and developed in the usual way of making a negative. In fact, the whole operation is exactly the same as in making a ferrotype on rubber instead of an iron plate, and a ferrotype bath and collodian are well adapted to the rubber. When a clean, sharp image is obtained, it is fixed in cyanide and varnished with a thin, transparent varnish, and dried by a gentle heat. The plate is now ready for the engraver, who will have a fine smooth surface and a clean drawing to work on.

When engraved, the plate is mounted on a wood block, and made type high, and is ready for the printer. The rubber is somewhat more difficult to engrave on than box-wood, but the surface is much finer, and makes a more durable printing block. Unless more than one cut is desired, it is unnecessary to have it electrotyped, as wood cuts are, but the original can be used in the press along with type, and as many as 75,000 to 100,000 impressions taken from it before it shows wear.

THE TELEPHONE AS A LIGHTNING INDICATOR.—Mr. George M. Hopkins, of Brooklyn, N. Y., during a recent thunder storm connected the gas and water pipe of his dwelling with an ordinary Bell telephone, and discovered that the electrical discharges were plainly indicated, either by a sharp crack or by a succession of taps. This occurred when the discharge was so distant that the thunder was inaudible. The sound also seemed to be perceived by the ear before the lightning could be seen. There was a marked difference in the character of the discharges, some that appeared single to the eye were really multiple. Often the discharges would consist of a series, beginning and ending with discharges larger than the rest, thus: ▬ - - - - - ▬, sometimes it would be thus: You will have to use small turned rules, and thick ones ▬ - - - - -, sometimes the reverse, and often a single crack. The gas and water pipes were used, being the most convenient and at the same time the safest conductors for the purpose. Special apparatus might be devised, having a good ground, and a series of points for gathering the electricity from the air, but in using apparatus of this kind there is always more or less danger.—*Scientific American.*

IMPROVEMENT IN SUGAR MANUFACTURE.—A sugar planter and manufacturer sends the Martinique *Bienpublic* an account of an experimental application to sugar cane of the diffusion process employed in the beet-sugar factories of France and Germany. The experiments were made at the plantation Moncepos, Guadaloupe, with an apparatus of six macerators. It was badly adapted to meet the difficulties incident to the peculiar nature of cane, yet it showed (1) that by a methodical washing of the slices of cane an artificial juice nearly equal in density to natural cane juice could be obtained; and (2) that one hour of systematical maceration is sufficient to completely exhaust the cane fiber of the sugar which it contains.

THE ROBERTSON PROCESS.—The results of the trials of this new process, so far as it has been tested on ores from this county, indicate that it will actually accomplish what we have so often been promised, a wonderfully beneficial "revolution in quartz mining." A short time ago Mr. Parkinson, an "expert," paid $15 per ton for ten tons of ore from the Rose mine, this city, which Mr. Brewster, proprietor of that mine, could not make pay more than $7 to $8 per to ten by ordinary mill process. This ten tons of ore was sent to Sacramento, and there worked by the Robertson process, and yielded $382.50, or $38.25 per ton. A lot of about eleven tons from the Gold Deposit mine, Kelsey district, which was rated as about $25 to $30 rock by ordinary mill process, was sent down to Sacramento, and yielded about $1,200, or $110 per ton by the Robertson process. A small six-pound sample of Gold Deposit ore yielded $107.15, or at the rate of about $35,000 per ton. It is confidently claimed for this process, and the above results seem to justify the claim, that it will save all the gold there is in the rock. And, best of all, an outfit for reducing ore by this process can be obtained at vastly less cost than attaches to the old style.—*Mountain Democrat.*

MAGNETS IN THE MILLS.—The introduction of magnets into all the great mills of Minneapolis and a great many elsewhere, says the correspondent of a Chicago paper, has been a revelation to the millers who complained of wire in wheat. Not only have the magnets captured all the stray pieces of iron bands, and thus removed the last and only objection urged against wire binding harvesters, but they have revealed the startling fact that of the scraps of iron and steel that find their way to the mills mixed with wheat, fully one-half are something beside pieces of wire, and a larger proportion of which are of such a nature as to be even more dangerous to mill machinery. The magnets gather everything of this kind with the certainty of fate, and millers are free to acknowledge that their introduction is a blessing the value of which cannot be overestimated. The device is so simple and cheap, and the remedy for the evils complained of is so complete, that farmers and manufacturers will never again hear any complaints from millers, growing out of self-binding harvesters and wire bands.

PRESERVATIVE WRAPPING AND PACKING PAPER.—Mr. John F. Rodgers, of Philadelphia, claims to have discovered a preservative wrapping and packing paper for protecting cloths, furs, etc., from mildew and ravages of moths and other insects. The patent bears the date January 9th, 1878. The paper used is made from woolen and cotton rags and manila rope or manila paper. This paper is saturated with a mixture of 70 parts, by measure, of the oil remaining from the distillation of coal tar naphtha by live steam with five parts crude carbolic acid, containing at least 50% of phenols, 20 parts of thin coal tar, heated to about 160° Fah., and five parts of refined petroleum. After saturating the paper it is passed through squeezers and over hot rollers for the purpose of drying. When cool it is cut into sheets as desired, and the drying completed in the atmosphere. The paper thus treated is used for packing woolen clothing, cloths, furs, carpets, and all material likely to be injured by moths, mice, or vermin, and will also to a great extent, he states, prevent cotton material from mildew.

LIGHTNING RODS.—Mr. R. S. Brough has been discussing, in the *Philosophical Magazine*, the proper sectional areas of iron and copper lightning rods. So far as mere conductivity is concerned, a comparatively thin wire of either metal would suffice for any conductor; but such a thin conductor would be dangerous, because it would be fused by a heavy discharge of lightning. Iron being more liable to be fused than copper, Mr. Brough sought to determine the relative sectional areas of rods of two metals, so that neither would be more liable to fuse than the other. Ordinarily, it is stated that the iron rod should have four times the sectional area of the copper rod. Mr. Brough shows that these areas should be as eight to three; or since the rods are invariably made circular, and circular areas are to each other as the square of their diameters, the diameters of iron and copper rods of equal effectiveness should be in the proportion of 1.63 to 1. Iron is, therefore, much the cheaper metal for lightning rods.

THE MONT VENTOUX METEOROLOGICAL OBSERVATORY.—Some time ago M. Beuvier, Engineer-in-Chief of Bridges and Highways in the Department of Vaucluse, took the initiative in advocating the construction of an observatory at the summit of Mont Ventoux. Considerable subscriptions in aid of the good work have since flowed in from friends of agriculture and of science, and at its last meeting the Conseil General of the Department, at the instance of M. E. Raspail, voted a sum of 20,000 francs towards the construction of a road giving access to the site. The contemplated work may now, therefore, be considered on the high road to success, and its completion will be regarded as a subject of legitimate congratulation, for an observatory at this point should furnish valuable data, which, combined with those collected at Pic-du-Midi and Puy-de-Dome, will render complete the system of meteorological studies for the whole of the south of France.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending July 2.		Week Ending July 10		Week Ending July 17.		Week Ending July 24	
Alpha	28	24	28	25½	26¾	25½	25½	21
Alta	10⅞	6¾	12½	9	11	8¾	8¼	6¼
Andes	1.45	90c	1¼	1.15	1.20	1	1.05	80c
Alps	....	....	....	....	....	....	....	....
Argenta	1.05	1	1	65c	1.05	90c	1.65	1.30
Atlantic	35c	30c	40c	....	35c	....	....	....
Aurora Tunnel	1	60c	60c	50c	50c	20c	50c	40c
Baltimore Con	....	....	....	....	....	....	....	....
Belcher	6⅜	6	6¼	4.95	5⅜	4.90	5	3.80
Belmont	40c	35c	40c	....	50c	40c	40c	....
Best & Belcher	19	17½	20	18	18	16¾	17¾	15¼
Bullion	8	7⅞	7⅜	6	6¾	6⅜	6¼	4.80
Bechtel	2.30	1.95	2½	2	1.95	1.80	1.80	1¼
Belle Isle	1.60	1.45	2½	1.65	2.90	2¼	4.80	3¼
Bodie	24½	22½	22	20¾	20½	18½	17¾	11¾
Benton	7¼	5¼	8⅜	6¼	7¼	6⅜	5¼	4
Bulwer	10	9	9	....	8½	8	9	6¾
Boyle	....	....	....	....	....	....	....	....
Black Hawk	2.15	2	2	1½	1.70	1	1½	1
Belvidere	1.95	1½	1½	1	2¼	1.10	1.10	90c
Booker	1.40	1	1¼	1.10	1½	85c	1.10	95c
Caledonia	2.60	2½	2.60	2¼	2.40	2.05	2.35	2.05
California	5⅜	5¼	5	4½	4.90	4¾	4.95	4.60
Challenge	2.95	2.80	2¾	2½	2.60	2	2.40	2.10
Chollar	8⅞	7⅞	8	6¾	7¼	6	7	6
Confidence	16¾	13¼	12½	12	11½	10½	11	10¼
Con Imperial	1.90	1.70	1.95	1.60	1¾	1½	1.65	1¼
Con Virginia	5⅜	5¼	5	4½	4.85	4.65	4.80	4.60
Crown Point	4.80	4¼	5⅜	5	5¼	4.90	5	4
Con Washoe	....	....	....	....	....	....	....	....
Champion	65c	60c	75c	55c	80c	55c	90c	50c
Concordia	....	....	....	....	....	....	15c	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	25c	5c	25c	....	20c	15c	20c	15c
Daney	....	....	....	....	....	....	....	....
Day	35c	30c	35c	30c	30c	20c	20c	....
Eureka Con	17	16½	16½	15¾	16½	15½	16	15
Exchequer	8	7⅞	7⅞	6⅞	7	6¼	6	5
Endowment	35c	30c	35c	....	45c	35c	45c	40c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	4	3½	3.90	3.80	4	3½	3.90	3⅝
Gila	1.30	95c	1	1.15	1.10	1	1¼	1.05
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	14	....	13½	12	13¾	....	13¾	....
Goodshaw	....	....	80c	45c	50c	40c	50c	40c
Gould & Curry	12¾	12	12¾	11¼	10¾	10¼	10	8
Hale & Norcross	18	16	17¼	14½	15¼	12½	14¾	11¾
Hillside	1¾	....	1¼	....	1½	1½	1¼	....
Highbridge	25c	15c	25c	....	25c	20c	20c	....
Homestake	....	....	....	....	....	....	....	....
Hussey	25c	20c	25c	20c	25c	15c	20c	15c
Independence	2½	2¼	2½	2¼	2.55	2.30	2.45	1.80
Julia	5.40	2¼	4¼	3¼	3¾	3½	3.60	3.05
Justice	4.90	4	5⅝	4½	5½	4½	5¼	4.15
Jackson	5	....	5	....	4¼	4	4	....
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	5	4.60	4½	4	4.60	4.10	4.30	4
Kossuth	....	....	....	....	....	....	15c	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	1.30	1	1.40	1	1.20	90c	1	75c
Lady Wash	2.65	1.60	2.80	1¾	2	1¾	1.70	1½
Leopard	1.10	1	1.20	90c	1.60	1	1.60	1.20
Leviathan	75c	70c	75c	65c	65c	55c	55c	40c
Leeds	....	....	1	....	80c	70c	75c	....
Lee	....	....	....	....	....	....	....	....
May Belle	70c	45c	50c	....	40c	30c	40c	....
Modoc	....	....	....	....	....	....	1	....
Manhattan	3	2½	3	2½	3.10	2¾	2¾	2¼
Martin White	7	5½	6	5¼	6	5⅜	6	5¼
McClinton	1½	1.40	1.40	1½	1½	1¼	1.30	1
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	27¾	26¼	25¾	24	26⅜	23	25¾	21
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	....	....
North Con Virginia	9¼	9	9¼	9	9¼	9	9¼	9
New York	90c	65c	1.15	70c	75c	60c	60c	40c
Northern Belle	5¾	....	5¼	5	5	4	4.95	4¾
New Coso	20c	....	....	....	....	....	....	....
Navajo	40c	25c	40c	30c	45c	40c	50c	40c
Occidental	1	80c	1	90c	1	85c	1	90c
Ophir	31¾	30¼	31½	29	37	31	36½	30¼
Oriental	40c	25c	25c	....	25c	20c	15c	10c
Overman	11⅜	10½	11	9	10¼	9	9¼	8¼
Panther	....	....	....	....	....	....	....	....
Phenix	3	2.90	3	....	....	....	....	....
Phil Sheridan	75c	60c	70c	....	....	....	....	....
Potosi	6	5½	5⅞	4½	5	4¾	4.95	4.15
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	4	....	4	3.90	4.10	3.90	4	3
Richer	1½	95c	1¼	40c	90c	60c	75c	50c
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	17	15½	15⅜	13½	14⅜	12½	14	11½
Seg Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	46¾	43	41½	37	42½	38¼	42	31¼
Silver Hill	2.20	1.80	2½	1¾	1.70	1½	1.60	1¼
Silver King	8	7	8	7	7½	7	7¼	6¾
Silver Prize	....	....	....	....	15c	....	25c	20c
Succor	15c	10c	15	10	15c	10c	15c	10c
Summit	2½	2.30	3	2.65	2½	2.10	2.35	1.40
Scorpion	2½	2	2.10	2	2.10	1.70	1.80	1½
Solid Silver	45c	40c	40c	25c	35c	20c	30c	20c
South Bodie	45c	35c	40c	35c	40c	30c	30c	15c
South Standard	25c	20c	25c	20c	25c	20c	20c	15c
Star	40c	25c	50c	....	75c	50c	60c	45c
St. Louis	....	....	....	....	....	....	....	....
Syndicate	8¾	6	8¼	7½	8	7½	7	5
Tioga Con	7¼	6⅞	6⅜	4.90	5⅝	4.60	4½	3¼
Tiptop	1.15	1.10	1.10	1	80c	75c	90c	75c
Trojan	25c	....	25c	....	....	....	10c	5c
Union Con	45	40¼	39	32	38	36½	37	29
Utah	22	20	19	15¾	18¼	17¾	17½	13½
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.65	1½	1.45	1⅛	1.40	1¼	1.40	1⅛
Wells-Fargo	....	....	....	....	....	....	....	....
Woodville	30c	25c	50c	30c	50c	40c	50c	40c
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	17⅞	17	16¾	14⅛	15½	14¾	15	12½

Sales at S. F. Stock Exchange.

Friday A. M., July 18.
1370 Alta....8¾@8½
505 Andes....1@1.05
55 Alpha....25½@25
320 Belcher....5@4.95
740 Bullion....6¼@5¾
1830 Benton....5¼@4.90
20 Best & Belcher..17¾@17⅝
170 California....4.90@4.95
40 Con Virginia....4.85
50 Chollar....7
650 C Dorado....1.90
115 Challenge....2.40@2.30
200 Caledonia....2¼@2.20
55 Crown Point....5
1240 Con Imperial..1.65@1.60
715 Exchequer....5⅜@5
675 Europa....25c
500 Fairfax....1¼@1½
100 Flowery....50c
120 Gould & Curry...10⅜@10¼
70 Hale & Nor....14¾@14⅜
265 Julia....3½@3.60
760 Justice....5@5½
20 Kentuck....4½
100 Leviathan....55c
1895 Lady Wash....1.70@1½
500 Mackey....1.45
160 Mexican....25¾@25¼
100 Mt View....2.30
140 N Bonanza....1⅜@1.40
100 North Con Vir....9¼
250 New York....60c
150 Occidental....90c@1
390 Ophir....36½@36¼
150 Potosi....4.90@4.95
80 Savage....13⅞@14
100 Succor....10c
70 Solid Silver....30c
220 Scorpion....1.60@1½
525 Silver Hill....1.60@1½
145 Sierra Nevada....42
100 Trojan....10c
30 Union Con....37
50 Utah....17½
950 Ward....1¼@1.40
105 Woodville....50@45c
90 Yellow Jacket....15@14¾

AFTERNOON SESSION.
2335 Argenta....1.35@1.45
350 Adenda....50c
250 Albion....15c
750 Aurora....40@50c
175 Bodie....17¾@17⅝
455 Bechtel....1.60@1.80
775 Booker....1@1.10
395 Black Hawk....1¼@1½
195 Belvidere....1.10@1
10 Bulwer....7
1180 Belle Isle....3.30@3¼
1350 Champion....90@85c
400 Crœsus....20@25c
480 C Pacific....7⅞@8
115 Day....20c
100 D Standard....1
360 Dudley....2@1.90
600 Defiance....1.45@1½
120 Eureka Con....15¾
1840 Goodshaw....50@40c
600 Gila....1.05@1.10
50 Hillside....1¼
300 Highbridge....20c
1320 Independence....2⅜@2.45
40 Jupiter....1¾
255 Leeds....75c
1180 Leopard....1½@1.60
395 Mammoth....13@13½
250 Martin White....5¼
695 McClinton....1.20@1¼
45 Mt Diablo....4
455 Mono....10½@10⅜
500 Manhattan....2¾
100 Northern Belle....4.85
110 Navajo....40c
1675 Orient....65@55c
725 Paradise....1.60@1.70
1100 Queen Bee....55@60c
35 Raymond & Ely....4
300 Rustler....50@55c
50 Red Cloud....50c
385 Syndicate....7@7½
350 S Bulwer....80@85c
110 Summit....2¼
600 S Bodie....30@25c
100 Star....60c
100 Tiptop....90c
965 Tioga Con....4¾@5
1000 University....65@75c
500 Vortex....60@65c
130 Wales....4

Saturday A. M., July 19.
720 Andes....80@85c
1430 Alta....7¼@7⅝
10 Alpha....25
1200 Argenta....1.45@1.40
40 Best & Belcher....17½
350 Belcher....4.80@4.95
925 Bullion....6@5¾
2480 Benton....4.60@4¾
50 Belmont....40c
100 Bechtel....1.60
605 Belle Isle....3¼@3.40
570 Bodie....16½@16¼
100 Belvidere....1.10
100 Black Hawk....1¼
45 Bulwer....6¾@7
45 Con Virginia....4.80
150 Crown Point...4.60@4.70
215 California....4.85
20 Chollar....6¾
1819 Con Imperial....1.60@1½
70 Confidence....10½@10¾
250 Caledonia....2¼
430 Champion....80c
190 C Pacific....7¾@7¼
100 DeFrees....20c
100 Dudley....1.90@1.85
650 Defiance....1⅜@1¼
460 Exchequer....5¾@6
415 Eureka Con....16@15¾
135 Europa....25@20c
50 Flowery....50c
390 Gould & Curry....10
125 Gila....1.05
145 Grand Prize....3¾@3.70
50 Goodshaw....50c
50 Golden Terra....13¾
185 H & Norcross....13¾@14
200 Hamburg....40c
1075 Independence..2.35@2.10
330 Julia....3.55@3.60
140 Justice....4.90@4.80
100 Jupiter....1¾
50 Kentuck....4.30
200 L Bryan....1
2530 L Wash....1.35@1.40
225 Leviathan....55@50c
300 Leopard....1.60
190 Mexican....23½
100 Mt View....2.40@2.30
725 Mackey....1.40@1.45
635 Manhattan....2.65@2¾
300 McClinton....1½@1.30
40 Mt Diablo....4
100 May Belle....40c
1410 Mono....9@9¼
485 Mammoth....13½
430 M White....5½
100 New York....50c
875 N Con Virginia....9@9⅛
100 Northern Belle 4.80@4.90
150 Ophir....33½@33¾
175 Overman....9¼@9
3150 Orient....60@55c
20 Potosi....4¾
275 Paradise....1¾
560 Queen Bee....65@70c
10 Raymond & Ely....4
25 Richer....75c
305 Savage....13½@13¾
325 Sierra Nevada....39½@39
1150 Succor....15c
230 Silver Hill....1.55
10 Silver King....7¼
180 Scorpion....1½@1.60
120 Solid Silver....30c
450 S Utah....10@5c
300 S Potosi....85c
500 Star....55@50c
110 Syndicate....7
1200 South Bodie....20c
420 S Bulwer....80@75c
940 S Standard....20c
200 Trojan....10c
25 Tuscarora....15c
500 Tiptop....75c
50 Utah....16½
295 Union Con....32@32½
200 University....65c
400 Vortex....60c
350 Woodville....45@40c
460 Ward....1½
430 Yellow Jacket....14¾@14

Monday A. M., July 21.
610 Alta....7¾@7⅝
300 Andes....80c
850 Benton....5@5¼
180 Bullion....5⅝@5¼
445 Belcher....4.60
30 Best & Belcher....17¼
370 California....4.90@4.85
295 Con Virginia....4.85@4¾
50 Chollar....6¼@6⅜
185 Crown Point...4.65@4.70
20 Confidence....10¼
350 C Dorado....1.85
110 Challenge....2.40@2.35
1010 Con Imperial....1½@1.55
200 Caledonia....2¼@2.35
100 Europa....25c
160 Exchequer....5⅝@5½
1150 Flowery....50c
215 Gould & Curry....9⅝@9¾
30 Hale & Nor....13¼
90 Julia....3½@3.55
585 Justice....4.60@4¾
20 Kentuck....4
100 Kossuth....15c
275 Lady Wash....1⅜@1.40
60 Leviathan....50c
790 Lady Bryan....80@75c
610 Mexican....23¾@24¼
765 Mackey....1.35@1.40
600 N Bonanza....1½@1.40
600 New York....45@40c
110 Occidental....90@95c
435 Ophir....33
140 Overman....9
40 Potosi....4.65
175 Savage....13½@13¾
600 S Utah....10c
120 Sierra Nevada....39½@39
10 Seg Belcher....21
900 Silver Hill....1½@1.45
70 Scorpion....1.70@1⅝
200 S Potosi....85c
200 Trojan....5@10c
580 Union Con....33
450 Ward....1¼
115 Yellow Jacket....14¼@14¾

AFTERNOON SESSION.
200 Adenda....50@40c
650 Aurora T....50c
4190 Argenta....1.65@1.60
200 Albion....20c
500 Belle Isle....4¾@4.65
120 Bulwer....7½@8
550 Bodie....16¾@17
260 Bechtel....1.55@1.60
425 Booker....95c@1
150 Black Hawk....1.15@1¼
245 Belvidere....1@1.10
950 Champion....70@75c
475 C Pacific....8
100 Crœsus....25c
300 D Standard....1
80 Defiance....1.40@1.30
200 Dudley....1.80
80 Eureka Con....15
720 Gila....1.10
50 Golden Terra....13¾
230 Goodshaw....45@50c
250 Grand Prize....3.70@3⅝
100 Highbridge....20c
110 Hussey....20c
1165 Independence....2@1.85
390 Jackson....4
600 Jupiter....1.80@2
250 Leopard....1.60
150 Leeds....75c
780 Mono....8½@8⅜
70 Mammoth....13½
235 M White....5¾@6
100 McClinton....1½
950 Mt Diablo....4@4¼
190 Manhattan....2.60@2¾
720 Navajo....45c
4200 N Belle Is....55@60c
285 Northern Belle 4.80@4.95
1050 Orient....50@55c
100 Oriental....15c
400 Paradise....1.65
2040 Queen Bee....70@75c
150 Rustler....60c
125 Raymond & Ely....3¾
75 Richer....50c
700 S Bulwer....70@75c
550 South Standard..20@15c
100 Silver Prize....20c
250 Star....50c
50 Syndicate....6½
1200 S Bodie....15@20c
200 Summit....2.35@2¼
790 Tioga Con....4¼@4.05
50 Tiptop....75c
250 University....55c
100 Vortex....60c
300 Wales....4½@5

Tuesday A. M., July 22.
845 Alta....7½@7¼
440 Andes....85c@1
715 Bullion....5@5¼
60 Best & Belcher..17¼@17⅛
710 Benton....4¾@4.90
175 Belcher....4½@4.55
25 Confidence....11
360 Crown Point....4.70@4¾
815 Con Imperial....1½
50 Challenge....2.30
270 Caledonia....2.10
335 California....4.90@4.95
95 Con Virginia....4.60@4¾
550 Con Dorado....1.80
150 Europa....25c
310 Exchequer....5⅜@5¾
450 Flowery....60@65c
250 Gould & Curry....9⅝@9¾
140 H & Norcross....13½@13¾
530 Julia....3½@3.40
250 Justice....4.65
370 L Bryan....90c
120 Leviathan....50c
650 Lady Wash....1.35@1¼
340 Mexican....23½@23¾
100 Mount View....2.30
515 Mackey....1.35@1.30
600 N Bonanza....1½@1.55
910 New York....55@50c
120 Overman....8¾
695 Ophir....33
60 Potosi....4.65@4.70
570 Savage....12⅞@13
165 Scorpion....1.80@1¾
140 Silver Hill....1.35@1¼
400 Succor....15c
130 Sierra Nevada...39½@39¾
650 S Utah....5c
200 Solid Silver....20c
500 Trojan....10c
480 Union Con....33@33¼
60 Utah....16
830 Ward....1¼@1.35
25 Woodville....40c
120 Yellow Jacket....15@14⅝

AFTERNOON SESSION.
500 Albion....25@30c
1970 Argenta....1.65@1.60
850 Addenda....50@45c
305 Aurora T....50@40c
210 Bulwer....9@8⅞
130 Belvidere....1
75 Bechtel....1½@1.55
365 Bodie....15¾@15½
750 Booker....75@80c
1800 Belle Isle....4.80@4.65
260 Black Hawk....1¼@1.05
2450 Champion....60@50c
500 Concordia....15c
900 Crœsus....25@20c
50 C Pacific....7¾
250 Caledonia (B H)....2½
100 DeFrees....15c
500 Day....20c
20 D Standard....75c
100 Defiance....1.30
300 Dudley....1.60@1¾
280 Eureka Con....15
150 Endowment....45@40c
810 Grand Prize....3.80@3.70
60 Giant & O A....6
35 Goodshaw....40c
550 Gila....1.10
300 Hussey....20@15c
1075 Independence....2@1.85
240 Jupiter....2
100 Leeds....75c
890 Leopard....1.55
200 Modoc....1
150 Mammoth....13
130 Martin White....6
610 Manhattan....2.60@2.65
350 Mono....8@7¾
2575 N Belle Is....90c
350 Northern Belle....4¾
600 Navajo....45@50c
1100 Orient....50c
335 Paradise....1.60@1.70
1000 Queen Bee....70@75c
200 Richer....60c
250 Rustler....60c
300 S Bulwer....75c
100 Silver King....6¾
500 Silver Prize....25c
100 Star....50c
300 S Standard....15c
600 S Bodie....20c
130 Syndicate....6½
25 Summit....2¼
420 Tioga....4.05@4
25 Tuscarora....15c
580 Tiptop....75c
100 University....50c
300 Vortex....70@65c
100 Wales....5¼

Wed'sday A. M., July 23.
1275 Alta....6¼@6⅜
155 Alpha....22@21
660 Andes....85@80c
935 Belcher....3.80@3.90
580 Bullion....4.80@4.90
320 Best & Belcher..15¼@15½
1340 Benton....4@4.15
380 Con Dorado....1.70@1¾
1075 California....4.60@4¼
180 Caledonia....2.10@2.05
320 Chollar....6¼@6
425 Con Virginia....4.60@4¾
385 Challenge....2.15@2¼
335 Crown Point....4.05@4
2935 Con Imperial....1.30@1¼
350 Confidence....10¼@10½
950 Exchequer....5¼@5
50 Europa....25c
580 Flowery....60@50c
740 Gould & Curry....8⅜@8
440 Hale & Nor....12@11¾
1200 Justice....4¼@4.15
705 Julia....3.30@3¼
100 Kentuck....4
670 Lady Wash....1.15@1⅛
280 Lady Bryan....95c@1
300 Leviathan....45c
885 Mexican....21@21¼
260 Mackey....1.20
2665 N Bonanza....1.35@1¼
1190 New York....45@40c
100 North Con Vir....9@9¼
705 Ophir....30¼@30½
100 Overman....8¼@8½
585 Potosi....4¼@4.15
775 Savage....11½
450 Succor....15c
675 Silver Hill....1.20@1¼
505 Sierra Nevada...35¾@34½
450 Scorpion....1½@1.60
600 S Utah....10c
200 Trojan....10c
75 Utah....13½
1015 Union Con....30@29
215 Woodville....40c
1520 Ward....1¼@1.20
1065 Yellow Jacket....13@12½

AFTERNOON SESSION.
880 Argenta....1.30@1.40
250 Addenda....45c
900 Albion....30c
1080 Booker....75@80c
1175 Bodie....12¾@11¾
1190 Bechtel....1¼@1½
1620 Belle Isle....3½@3¼
1215 Black Hawk....1
1265 Belvidere....90c@1
200 Caledonia (B H).2¼@2.60
510 C Pacific....7¼@6⅞
1000 Champion....55@50c
1095 Dudley....1.40@1½
120 D Standard....75c
100 DeFrees....20c
150 Day....20c
115 Eureka Con....15
820 Gila....1¼@1.15
200 Grand Prize....3.90
1200 Goodshaw....40c
100 Highbridge....20c
910 Independence..1.80@1.85
460 Jupiter....1.60
80 Jackson....4
925 Leopard....1½@1.20
320 Manhattan....2.30@2¼
460 Mammoth....11@11¼
10 Martin White....6
585 Mono....6@6½
120 Mt Diablo....4½
300 McClinton....1
40 Northern Belle....4¾
3190 N Belle Is....65@55c
950 Navajo....40@45c
150 Oriental....10c
950 Orient....50@45c
500 Paradise....1.60@1.70
1150 Queen Bee....50@55c
60 Raymond & E....3
550 Richer....50c
100 Rustler....60c
915 Summit....1¾@1.40
325 Syndicate....5@5¼
750 S Bodie....20c
250 S Bulwer....70c
200 S Standard....15@20c
600 Silver Prize....25c
240 Star....50@45c
1695 Tioga Con....3½@3¼
50 Tiptop....75c
1650 University....40@45c
600 Vortex....65@55c
100 Wales....5¼
220 Ward....1.35@1.30
50 Yellow Jacket...15¾@16¼

AFTERNOON SESSION.
740 Aurora T....30c
1410 Addenda....50c
1150 Argenta....1.30@1.40
350 Booker....1.05@1.10
1830 Black Hawk....1¼
290 Belvidere....1.15
30 Bulwer....7¾@8
240 Bodie....17@17¼
130 Bechtel....1⅜@1.70
1170 Belmont....45c
1030 Belle Isle....3
1450 Champion....70c
185 Con Pacific....7¾@8
20 Caledonia (B H)....3¾
200 Crœsus....20c
100 DeFrees....15c
490 Dudley....1.80@2
350 Defiance....1.30
350 D Standard....1
45 Eureka Con....15¾
50 Goodshaw....45c
80 Grand Prize....3.95
950 Gila....1.05
100 Hussey....20c
700 Highbridge....20c
250 Hillside....1½
1430 Independence...2¼@2.35
20 Jackson....4½
105 Jupiter....1¾
140 Leeds....75@70c
225 M White....5
245 Mammoth....11
520 Mono....8½@8⅝
715 McClinton....1.30@1¼
100 May Belle....45c
160 Mt Diablo....4½
450 Manhattan....2⅝@2.60
495 Northern Belle 4.80@4.90
100 Navajo....35c
350 Oriental....20@15c
650 Orient....60c
380 Paradise....1.40@1.60
1000 Queen Bee....60@65c
10 Raymond & Ely....4
540 Rustler....50c
100 Real del Monte....1.30
450 Red Cloud....55@50c
365 Syndicate....7@6¾
100 Star....65c
220 Summit....2¼
650 S Bulwer....80@85c
900 S Bodie....30c
675 Tioga Con....4¼@4¼
650 University....60@70c
150 Vortex....60c
30 Wales....4

SALES OF LAST WEEK AND THIS COMPARED

Thursd'y A. M., July 17.
50 Alpha....25¼
570 Alta....9¼@9⅝
250 Andes....1.05@1.15
170 B & Belcher....17¾@18
135 Belcher....5½@5
380 Bullion....6¼@6⅜
735 Benton....6⅜@6¼
190 California....4.90
10 Crown Point....5
275 Con Imperial..1.70@1.65
100 Con Virginia....4.85
170 Chollar....6¾@7
60 Confidence....11½
250 Caledonia....2¼
180 Challenge....2½@2.60
1850 Con Dorado...2.10@2.05
525 Exchequer....6¼@6⅜
100 Europa....25c
50 Flowery....50
280 Gould & Curry...10¾@10⅝
285 Hale & Nor....15¼@15
630 Justice....5¼@5⅜
75 Julia....3.65@3.60
190 Kentuck....4¾@4.60
325 Lady Bryan....90c@1
450 Lady Wash....1.80@1¾
180 Leviathan....55@60c
600 Mexican....26@26¼
100 Mt View....2.30
950 Mackey....1.40@1.45
765 N Bonanza....1½@1.40
350 New York....60c
265 North Con Vir....9¼@9¼
880 Ophir....37@36¾
45 Overman....9¾
835 Potosi....4.90@5
190 Savage....14¼
140 Sierra Nevada...42½@42¾
275 Silver Hill....1.60
500 S Utah....10@5c
100 Solid Silver....30c
140 Scorpion....1¾@1.70
320 Union....37@36¾
15 Utah....17½@18
460 Woodville....50c

Thursday A. M., July 24.
845 Alta....6¼@6⅝
310 Alpha....22@21½
300 Andes....80c
360 Belcher....4.15@4.20
545 Bullion....5½@5¾
240 Best & Belcher....17
645 Benton....4¼
355 Crown Point....4¼@4.30
20 Chollar....6⅝
260 Con Virginia....4.70@4⅝
50 Confidence....11
200 Caledonia....2.10
490 California....4.80@4¾
1510 Con Imperial..1.35@1.40
360 Challenge....2.20@2.10
400 C Dorado....1¾
955 Exchequer....5¼@5⅜
700 Flowery....65@60c
390 Gould & Curry....8¾@9
340 Hale & Nor....13
320 Justice....4¼@4.15
360 Julia....3.20@3.05
500 L Bryan....90c
200 Leviathan....40c
545 Lady Wash....1¼@1.15
590 Mexican....22¼@23
110 Mackey....1.20@1¼
100 Mt View....2.30@2¼
610 New York....45@40c
100 N Bonanza....1.45
75 N Con Vir....9½@9
385 Ophir....32
215 Overman....8¼@8⅜
250 Occidental....90c
160 Potosi....4½@4.40
80 Savage....12¼@12
565 Sierra Nevada....35@36
170 Silver Hill....1¼@1.20
50 S Utah....10c
200 S Potosi....85c
300 Solid Silver....25c
240 Scorpion....1½
1225 Trojan....10@5c
300 Union Con....29½@29
245 Utah....15½
610 Ward....1.15
455 Yellow Jacket...14¾@14¼

AFTERNOON SESSION.
150 Addenda....40c
145 Aurora T....50c
100 Albion....30c
900 Argenta....1.30@1.35
20 Belvidere....90c
130 Black Hawk....75c
210 Bulwer....8@8¼
400 Booker....90c
680 Bodie....14¾@15⅝
300 Bechtel....1½@1.45
1565 Belle Isle....3½@3.60
100 Caledonia (B H)....3
50 Crœsus....25c
160 C Pacific....7@6¾
400 Champion....55c
200 DeFrees....20c
700 Dudley....1¾
300 Defiance....1¾
500 Day....15c
40 Glory....3.10
520 Goodshaw....40c
700 Gila....1¼
1115 Grand Prize....4
700 Independence .1.90@1.85
1295 Jupiter....1.95@2
400 Leopard....1.30
270 Mammoth....12@11½
630 Mono....8@7¾
300 McClinton....1@1.05
100 Mt Diablo....4½
390 Manhattan....2¼
365 Northern Belle...4@4.40
450 N Belle Is....55@50c
450 Navajo....40c
1770 Orient....50@45c
625 Paradise....1¾@1.70
320 Queen Bee....65c
110 Raymond & Ely .3½@3.65
50 Richer....60c
180 Rustler....65@55c
600 Silver Prize....25c
50 S Bulwer....70c
360 S Bodie....15@20c
90 S Standard....15c
100 Syndicate....5¼
400 Summit....2@1.90
505 Tioga Con....3.70@3¾
550 University....50@45c
300 Vortex....60c

Pacific Board—Latest Sales.

Wed'sday A. M., July 23.
55 Alpha....21½@23
150 Alta....6¾@6¼
200 Andes....75c
200 Bodie....13¾@14
130 Best & Belcher....16@15¾
360 Bullion....4.60@4.90
350 Belcher....3.80@3.95
120 Benton....3.85@3.90
120 Crown Point....4¼@4.10
100 Con Virginia....4⅜
150 Con Imperial..1.35@1.30
250 California....4¾@4.70
100 Chollar....6
10 Confidence....10
100 Caledonia....2@2.05

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alta S M Co	Nevada	15	1 00	June 12	July 17	Aug 4	W H Watson	302 Montgomery st
Amazon Con M Co	Nevada	6	10	Mar 24	June 11	July 31	Jno Crockett	12 Cosmopolitan Hotel
Belcher S M Co	Nevada	19	1 00	July 21	Aug 26	Sept 16	Jno Crockett	203 Bush st
Belmont M Co	Nevada	21	30	July 1	Aug 7	Sept 2	J W Pew	310 Pine st
Belvidere M Co	California	4	25	July 9	Aug 11	Sept 6	C V Hubbard	203 Bush st
Booker Con G M Co	California	3	50	June 30	Aug 4	Aug 25	W H Lent	309 Montgomery st
Brilliant M Co	Nevada	3	10	May 19	June 23	July 28	H S Stone	419 California st
Bullion M Co	Nevada	10	1 50	July 9	Aug 13	Sept 3	J Gruss	418 California st
Commonwealth Con M Co	Nevada	1	25	June 27	July 31	Aug 20	C A Morse	217 Sansome st
Crown Point G & S M Co	Nevada	37	1 00	June 4	July 11	July 29	Jas Newlands	203 Bush st
Exchequer M Co	Nevada	14	1 50	July 9	Aug 15	Sept 5	J Gruss	418 California st
Goodshaw M Co	California	4	25	July 9	Aug 23	Sept 30	V Fernbach	327 Pine st
Gould & Curry S M Co	Nevada	36	1 00	July 10	Aug 14	Sept 3	Alfred K Durbrow	309 Montg'y st
Julia Con M Co	Nevada	9	1 25	July 8	Aug 13	Sept 4	H A Charles	419 California st
Jupiter M Co	California	4	25	July 5	Aug 11	Sept 4	E C Masten	22 Nevada Block
Leopard M Co	Nevada	11	50	June 11	July 15	Aug 5	J E Dixon	20 S F StockEx
Manhattan S M Co	Nevada	13	1 00	July 16	Aug 21	Sept 12	Jno Crockett	203 Bush st
Mexican G & S M Co	Nevada	7	2 00	July 11	Aug 14	Sept 4	C L McCoy	203 Bush st
N Noonday M Co	California	2	25	June 5	July 14	Aug 18	C A Holden	310 Pine st
New York M Co	Nevada	19	40	July 8	Aug 9	Aug 29	D L Thomas	203 Bush st
Real Del Monte M Co	Nevada	7	1 00	June 10	July 19	Aug 11	C V D Hubbard	203 Bush st
Savage M Co	Nevada	38	1 00	July 8	Aug 11	Aug 30	E B Holmes	309 Montgomery st
Sierra Nevada S M Co	Nevada	58	3 00	June 12	July 16	Aug 5	W W Stetson	309 Montgomery st
Silver Hill M Co	Nevada	7	50	July 10	Aug 14	Sept 4	W E Dean	203 Bush st
South Bodie G M Co	California	1	25	July 18	Aug 25	Sept 17	H Deas	309 Montgomery st
South Bulwer	California	4	15	July 16	Aug 20	Sept 12	Wm Stuart	320 Sansome st
Star M Co	Nevada	2	20	June 3	July 15	Aug 11	——.	320 Sansome st
Summit G M Co	California	2	50	June 5	July 10	July 31	W H Lent	309 Montgomery st
Tioga Con M Co	California	6	25	June 19	July 21	Aug 6	W H Lent	309 Montgomery st
Trojan M Co	Nevada	11	25	July 14	Aug 18	Sept 8	David Wilder	328 Montgomery st
University G M Co	California	2	10	June 9	July 14	Aug 4	W Letts Oliver	328 Montgomery st
Ward G & S M Co	Nevada	4	50	July 2	Aug 7	Aug 27	J Stadtfeldt, Jr	26 Haywards Build
William Penn	Nevada	5	05	July 12	Aug 13	Aug 30	O J Humphrey	328 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Addenda G & S M Co	California	1	20	July 2	Aug 7	Aug 28	T H Dixon	238 Montgomery st
Ajax G & S M Co	California	2	10	June 11	July 14	Aug 1	A F Main	309 California st
Allison Ranch Ford G M Co	Cal	—	01	June 16	July 18	Aug 4	J E Carr	Grass Valley
America M Co	Nevada	1	50	May 9	———	July 31	Richard M Noyes	240 Montgomery st
Armand G & S M Co	California	1	10	June 9	July 28	Aug 25	J L Fields	240 Montgomery st
Armstrong G M Co	California	1	05	June 11	July 14	Aug 1	J W Pew	310 Pine st
Black Hawk G M Co	California	6	50	July 1	Aug 4	Aug 25	H A Charles	21 Haywards Build
Crœsus G & S M Co	California	1	05	June 16	July 21	Aug 14	E Hestres	328 Montgomery st
Curtis Con M Co	Nevada	1	10	July 11	Aug 11	Aug 30	H S Stone	419 California st
Dudley M Co	California	4	25	June 12	July 16	Aug 11	E C Masten	22 Nevada Block
Emigrant S M Co	California	4	50	May 10	July 3	Aug 4	B W Mudge	309 Montgomery st
Fall Creek M Co	California	3	40	June 11	July 22	Aug 14	C Robinson	310 Pine st
Florence Blue Gravel	California	4	05	April 18	———	July 29	F A McGee	Merchants Exchange
Giant and Old Abe M Co	California	1	50	June 4	July 15	Aug 14	———	49 Nevada Block
Gover M & M Co	California	38	50	May 21	July 1	Aug 11	W O Wilson	402 Front st
Hartford S M Co	California	1	50	June 18	July 21	Aug 13	S Heringhi	422 Montgomery st
Ida M Co	——	1	25	June 19	July 21	Aug 6	———	324 Pine st
Leo M Co	Nevada	5	50	June 14	July 18	Aug 8	J J Scoville	59 Nevada Block
Mayflower Grav M Co	California	5	10	June 17	July 22	Aug 8	J Morizio	328 Montgomery st
Mono G M Co	California	4	50	June 21	July 28	Aug 18	W H Lent	309 Montgomery st
Numa M Co	Nevada	1	03	June 13	July 24	Aug 11	D Wilder	328 Montgomery st
Oriental Con G & S M Co	California	3	25	June 25	July 25	Aug 11	H C Hinman	411 California st
Queen Bee M Co	California	4	10	July 10	Aug 30	Sept 2	T A White	113 Leidesdorff st
Rustler G M Co	California	1	10	June 30	Aug 4	Aug 18	A F Main	309 California st
Seg Europa M Co	Nevada	1	25	Apr 4	July 31	Aug 18	R B Noyes	240 Montgomery st
Sherwood Con M Co	Nevada	1	25	July 12	Aug 12	Aug 30	H S Stone	419 California st
Swansea M Co	California	1	10	June 14	Aug 4	Aug 25	F N Delaney	315 California st
Tellurium G & S M Co	California	18	10	May 29	July 5	July 31	J M Litchfield	415 Montgomery st
Union G & S M Co	California	20	05	June 9	July 10	July 26	R Vincent	Grass Valley
Wide Awake M & P Co	Arizona	7	02	June 23	Aug 1	Sept 1	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Benton Con Co	Nevada	Wm H Watson	302 Montgomery st	Annual	July 30
Comstock G & S M Co	Nevada	J M Buffington	309 California st	Annual	Aug 18
Keystone S M Co	California	F E Luty	330 Pine st	Annual	Aug 5
Lady Washington Con M Co	Nevada	Wm H Watson	302 Montgomery st	Annual	July 30
McMillen S M Co	California	A C McMeans	Safe Deposit Build'g	Annual	Aug 6
Navajo M Co	Nevada	J E Dixon	Stock Exchange	Annual	Aug 12
Newton Hyd D & M Co	California	C W Banks	320 Sansome st	Special	July 29
S Comstock Con S M Co	Nevada	J M Buffington	309 California st	Annual	Aug 18
Sutro M Co	Nevada	A B Cathcart	327 Pine st	Annual	Aug 4

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Argenta M Co	Nevada	J E Dixon	Stock Exchange	20	July 25
Belle Isle M Co	Nevada	John E Dixon	Stock Exchange	25	July 15
Bodie Con M Co	California	W H Lent	Nevada Block	1 00	Aug 1
California M Co	Nevada	C P Gordon	23 Nevada Block	50	June 17
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	60	June 16
Excelsior W & M Co	California	G P Thurston	315 California st	25	Apr 21
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	1 00	July 21
Independence M Co	Nevada	John E Dixon	Stock Exchange	25	July 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	Apr 30
Standard Con M Co	California	W Willis	309 Montgomery st	50	Apr 12
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	30	May 27

25 Exchequer	.5	160 California	4¾@1.80
160 Gould & Curry	.8½@8½	10 Confidence	.10
60 Hale & Nor.	.12½@12½	100 Con Imperial	1.30
200 Justice	.4@1.30	30 Flowery	.50c
50 Julia	.3.30	50 Gould & Curry	.8
80 Mexican	.21½@21½	300 Herald	.30c
100 N Bonanza	.1	160 Justice	.4½@4.10
110 Ophir	.30½@31	205 Julia	.3½
80 Potosi	.4	300 Lady Wash	.1.10@1½
45 S Nevada	.35@35½	10 Mexican	.21
50 Savage	.11	210 N Noonday	.2.45@2.70
40 Silver Hill	.1.20	375 Noonday	.3½@3½
10 Union	.29	20 Ophir	.30½@30½
200 Ward	.1.15	30 Potosi	.4.40@4
160 Yellow Jacket	.13½@13½	500 S Utah	.5c
		30 Sierra Nevada	.33½@34
AFTERNOON SESSION.		300 Trojan	.6c
20 Alta	.6	110 Tiger (B)	.1.60
50 Argenta	.1.40	50 Uncle Sam	.11
30 Benton	.4.10@4.15	40 Utah	.13½@13
30 Bodie	.13	70 Union Con	.22c@22½
80 Bullion	.5½@5.05	50 Woodville	.40c
70 Crown Point	.4½@4.05	270 Ward	.1½@1.15

California Board—Latest Sales.

Wed'sday A.M., July 23.		40 Justice	.4.30
60 Alta	.5½@6	20 Mexican	.20½
23 Ætna (N)	.6½@6	200 Mint	.9c
70 Belcher	.3½@3.80	20 North Carson	.1c
60 Best & Belcher	.15½@15½	60 Ophir	.30½@30½
40 Bullion	.4.85	100 Orient	.40c
30 California	.4.85	100 Prospect	.15c
30 Con Virginia	.4.60	90 Savage	.11½@11½
200 Con Imperial	.1.40	30 Sierra Nevada	.35
130 Caledonia	.2	400 S Utah	.7@5c
450 Central	.50@60c	200 Succor	.12@15c
70 Exchequer	.4.65@4.60	150 S Bodie	.20c
90 Gould & Curry	.8½@8½	50 Silver Jacket a	.30c
110 Goodshaw	.45c	300 Twin Peaks	.12c
70 Julia	.3½@3.30	30 Union Con	.29

The Mining Share Market.

Operations at the several stock boards drag at a doleful rate. Prices of shares have gone down, down, till dealers "in the lowest depths see lower deeps still opening to devour them." Margins disappear at a rate that threatens to break brokers and hurst their clients. The whole fraternity are being impaled on the ragged edge of dispair, or the almost equally uncomfortable forlorn hope. In Comstock securities the dulness is especially noticeable, is, in fact, appalling. Developments here are fearfully delayed. Prices tumble, hut expenses keep up, and production shrinks while assessments grow. Dividends are in the inverse ratio of disbursements, and so the outlook is panicky, admonishing managements of the necessity of supplementing pluck with economy and discretion. That these Comstock directories possess the hold on principle, is undeniable; hnt while perseverance is commonly a good thing, it is none the less a virtue for being sometimes tempored with moderation. Nevertheless, while business sense is, in the main, desirable, to one whose mission it is too hnck against stonewalls, the less brains the hetter. In this depressed state of the market hrokers must needs he put to their wit's end to make expenses. In this emergency the craft would do well to take counsel of good Isaac Walton, who counseleth his disciples after this wise, "when ye sucker becometh over shy in one pool, then do ye therenpon fish elsewhere, and if ye gudgeon refuseth to hite at the hait in use, get ye other whereof he wolleth not, for whiles this sort groweth that shy, that angling for him becometh a vexation and a vanity;" which being translated into modern language, and interpreted for brokers' use, means that they would do well to change their tactics or introduce some new gamhle to tempt the cupidity of the avaricious, and ensnare the unwary. To such as can hold, however, recourse to the expedients anggested may not be necessary, as the prices of stocks will no donht come np again after a time, and the market hoom as of old.

Bullion Shipments.

Since our last issue, we have noticed the following hullion shipments:-

Indian Queen, July 15th, $3,278.43; Alexander, July 18th, $6,823.97; Northern Belle, July 14th, $2,618.99; Mammoth, July 13th, $14,038.97; Independence, July 21st, $12,600; Belle Isle, July 21st, $33,700; Hillside, Jnly 21st, $4,200; Northern Belle, July 19th, $4,361.83.

THE REVOLVING GRAIN CAR.—Some time ago we alluded to the design of an Eastern inventor who proposed to transport Western grain to the East in revolving cars—cylinders that rolled along the track as they were pulled by the locomotive. We now learn from the *Prairie Farmer* that preliminary tests of these cars have proved satisfactory. One came into Chicago full of corn. Major Fitch, the state inspector of elevators, says: "The grain is in perfect order and is improved if anything hy heing transported hy the new system. This car was not loaded quite full, lacking probahly 10 or 15 hushels. I regard the car as an undoubted success." We are informed that among the points demonstrated hy the trip were the following: The rate of speed required for permanently holding the grain to the shell hy the centrifugal force, thus forming a solid cylindrical mass, preventing all attrition of the grain, was found to he about four miles per hour. Second, the perfect circulation of the air through the grain while in transit; also the effect of having the cylinders only partially filled, which was found to he in no way detrimental to the grain or car.

A WASHOUT, Ogallalla station, 30 miles west of Omaha, on the U. P. R. R., delayed trains 12 hours on the 21st.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

ITEMS. *Ledger*, July 19: The Oneida mill is running 40 stamps. There is a fair-sized body of ore in the lower drift, and mining matters in the little valley wear a more encouraging outlook than they have done for months. The Keystone mine, at Amador City, is getting in immense quantities of fire wood. A large number of teams are engaged in haulng. Work has been resumed on A. M. Vaughn's claim at Plymouth. The shaft is now down about 200 ft, the ledge being two ft wide, and the rock rich, paying $25 per ton by mill process. They are pushing work on the Lucky Baldwin in Big canyon. The hoisting works are up, and a full force of hands are making things lively in that old mining camp.

VOLCANO ITEMS. At the Downs mine another clean-up was had last week, resulting even more satisfactory than previous runs. The quantity of rock crushed is estimated at 144 tons, and from this the output of gold was $6,300, over $15 per ton. A new shaft is being sunk, which will be completed in the course of a week or two. Another quartz discovery has been made in the Volcano district, which bids fair to rival the famous Downs mine. W. Q. Mason is the lucky prospector. He has been prospecting around the 10 years past, and two weeks ago struck a quartz vein on the Welsh branch of Sutter creek, about three miles from Volcano. He was led to the discovery by some rich float rock picked up on the surface. The ledge is small, like all the rich pocket leads met with in that section. As far as opened it shows eight hnches wide. The richness of the rock is something extraordinary. Mason pounded 70 pounds in a mortar and obtained $42 in gold; he subsequently crushed 60 pounds and got $32.

BUTTE.

OLD BANNER.—*Mercury*, July 18: This mine, which was caved in 20 years ago, has been reopened by a shaft sunk 200 ft; then a crosscut of 50 ft, from which an incline was excavated a distance of 75 ft. The history of the mine prior to the cave warrants the belief that rich ore will be found.

CALAVERAS.

ITEMS.—*Chronicle*, July 19: In Negro gulch, in the vicinity of George Leavitt's ranch, they have discovered a quartz vein, averaging three ft wide, that prospects $100 per ton. We do not know how far development has progressed, hut enough work has been done to demonstrate the fact that the ledge is one of the most promising ever discovered in the county. Everything is going on in a promising way at the Gwin mine. In the 1500 level the ledge has narrowed down to 8 or 10 ft, and the ore increased in richness.

EL DORADO.

ITEMS.—*Democrat*, July 19: The Springfield is turning out very fine specimens of ore, and there is every indication of the 700 ft surpassing in richness the last. A whim has been put in working order at the Olds mine. Drifting on the ledge of the Central mine shows fine ore. A new pump is being put into the Tingman mine.

MONO.

BODIE CON.—*Standard*, July 15: The crosscut east from the old shaft, on the first level, is in 374 ft. The drift south, on ore, second level, is in 92 ft. The main east crosscut, third level, is in 267 ft. The east drift on the Standard line from north drift No. 1 is in 28 ft. The north drift No. 2, same level, is in 174 ft. The south winze is down 41 ft. The old north winze is down 46 ft. The new north winze is down 14½ ft. The vein in the bottom of the old north winze continues very fine in quality and size. They have not yet cut the vein in the new north winze, not being quite deep enough, but expect to be into it very soon. On the second level the vein is looking well and yielding very good ore, and on the first level the vein is improving very much in appearance and also in quality. The mill has been running steadily during the week.

LAST CHANCE MINE.—This mine is situated on the western side of Queen Bee hill in Bodie district. The Last Chance is 1,500 ft long and a ledge within its lines has already been developed a length of 600 ft by means of incline shafts 40 to 70 ft in depth. Ore from this ledge yielded $30 per ton.

NORTH FORK DISTRICT.—*News*, July 20: About 15 miles west from Mammoth City, Lake district, is located North Fork and Minaret districts, on the headwaters of the San Joaquin river, which takes its rise there. Information received from there represents the country as being extensive in ore production, and the ledges large and well defined. The formation is of porphyry and granite, and the mineral of the black sulphuret character. Mr. Wiesner, a gentleman doing business at Mammoth, and just returned from a prolonged visit to the district, brought in with him several valuable specimens of rock, assays from portions of which went as high as $14,000 to the ton in silver.

STANDARD.—The north drift from the east crosscut, 336 level, is in 283 ft; progress since last report, 11 ft. The upraise on ledge is up 225 ft; progress during the week, 10 ft, and the ledge here is about 12 ft wide of very fine ore. The ledge in the stopes is from 7 to 15 ft of very good ore. West crosscut from the south drift, 450 level, is in 143 ft. The winze in west crosscut from 550 level is down 30 ft; the ledge here is 10 ft wide of good ore. Have upraised on this ledge 25 ft, showing about eight ft of very fine ore. In the West Standard stopes the ledge is nine ft wide of the usual rich ore. In the south drift, 300 level, the ledge is six ft wide and looks well. In the stopes, south drift, 550 level, the ledge is about eight ft wide of good ore.

CRŒSUS.—The vein, which crops out boldly in the Syndicate ground, has been traced thence the entire length of the Cræsus claim, and shows a width of two ft at a depth of 300 ft from the surface, being the lowest point at which work has been done on this ledge. Assays taken during the past week show very good results in gold and silver.

ORO.—This mine adjoins the Addenda on the east, the Ooodshaw on the north, and the North Noonday on the west, and embraces 200 ft in width (having purchased the fnea) and 1,500 ft in length. The vertical shaft sunk as a double-compartment one, and has been rapidly pushed down to a depth of 240 ft. At 55 ft from the surface a ledge was cut carrying quartz, being from 20 inches to two ft in width. At 150 ft another vein was cut which carries gold and silver ore, the latter predominating.

UNIVERSITY.—Old works closed; new shaft down 25 ft. The ledge has been traced from the croppings at the mouth of the old shaft up the hill to the uew shaft and beyond, and is now being followed south for the purpose of proving the ground. Engine and boiler for the new shaft has been ordered and will soon arrive.

SYNDICATE.—There are now over 600 tons of ore cut down and in the chutes ready for transmission to the mill as soon as the present contract with the Standard company is completed. Assays from the breasts and old stopes continually improve as progress is made. A splendid ore dump is being built at the mine, which will permit the ore to be dropped directly into the battery hoppers without extra bandling.

SUMMIT.—The north drift, 200 level, is in 291 ft; progress during the past week, five ft. The ledge is two ft wide. East crosscut from this drift is in 168 ft. The south drift is in 134 ft; progress for the week, 21 ft. The ledge is three ft wide. It will cost about $1,500 to repair the shaft, house, etc., which was damaged by the explosion.

NORTH BULWER.—Good headway is being made in sinking and timbering the new joint shaft. The formation in the bottom is changing for the better, being full of ledge matter and quartz of a fine character. Assays continually improving as progress is made.

TIOGA.—The winze on the 320 level, on the Yerrington vein, down 110 ft; ore improving as depth is gained.

SOUTH BULWER. Ledge looking well and increasing in strength, and is now three ft wide of good ore.

GOODSHAW.—East drift is now in 430 ft and still progressing at the rate of three ft per day. The formation is of quartz and porphyry.

BLACKHAWK.—East drift on the 320 level in 135 ft; fine formation. Winze, same level, on Warren ledge, down 08 ft on the vein, which shows four ft of fine rock. North drift on same ledge in 128 ft; looking well.

NORTH STANDARD.—The stringers and strata of fine-looking quartz increase in width with every ft sunk.

BULWER.—The south drift, 350 level, is in from the east crosscut 100 ft; progress since last report, 10 ft. The ledge is three ft wide of good ore.

VORTEX.—The winze from the north drift on the 200 level has now attained a depth of 15 ft. The ledge in the bottom is three and one-half ft wide, of splendid ore, and is improving in quality as depth is attained. Good ore is now being hoisted daily to the surface which can be milled at a very handsome profit.

BODIE TUNNEL.—Tunnel is about 1,060 ft and a new contract has just been let to run a further distance of 100 ft. Are at work drifting on the vein at the 900 station.

MARYLAND CON.—South drift is now in 40 ft, and the north drift 32 ft. The flinty horse encountered has been passed through and better material encountered beyond it.

SOUTH BODIE.—East crosscut, 500 level, is in 197 ft, 20 ft having been made during the past week.

NEVADA.

ITEMS.—*Transcript:* The Idaho mine is running its full head of 50 stamps. Work is about to be commenced on the Sneath & Clay mine. The Nevada Foundy is filling a large number of orders for mining machinery. The Oriental Con. is to be supplied with a 20-stamp mill. New hoistlng works for the new shafts of the Merrifield and Constitution mines are completed. The latter mine is near the Munchie, and is yielding very rich ore.

WASHINGTON.—*Foothill Tidings*, July 19: The Last Chance mine, on Diamond creek, about eight miles above the town of Washington, has a fine prospect in the upper tunnel. They have just cut the ledge, which is from 14 inches to 2½ ft in thickness and shows well in free gold and sulphurets. The lower tunnel is within 30 ft of the ledge, which it will cut at a depth of 80 ft from the surface. This property is finely located and has extensive croppings which themselves prospect well in free gold and sulphurets. Osborne & Co., on the southern extension of the Last Chance, are now building reduction works at their mine, including a Robertson furnace and process, and expect to have them in operation in about two weeks. The Bessie Miller company have resumed operations at their mine, repairing the old tunnel, building shop, cabins, etc. Grissel & Co., a short distance above Rocky Bar, are putting in a large flume, and getting ready for work, and several other companies are also busy preparing for this class of mining. In the Deadwood mine, 3,000 ft of pipe have been put in to convey water from the Snow Mountain ditch to the mill, the machinery of which is run by a hurdy. A pressure of 304 ft is given, with a stream that measures 22 miner's inches. The south drift on the 400 level is in 230 ft, showing a pay chute for 200 ft of that distance. The ledge is from one and a half to three ft thick, and a crushing of the rock recently made, yielded about $80 in free gold per ton, while one-tenth of the mass is composed of sulphurets. The Live Yankee mine, situated between here and Nevada City, has its shaft now down 120 ft on the ledge. The rock at this depth is much better than was expected. The ledge is 13 inches thick, and very heavily charged with sulphurets and galena—some miners computing it as high as one-half.

ROCKY BAR MINE.—*Union*, July 20: The water has been pumped out of the Ghavanne shaft preparatory to connecting a drain drift through to the New York Hill mine. The incline was found to be 317 ft deep to the 3d level, with a sump 16 ft below. Quartz of a fair quality is found in the drifts and stopes of the 3d level, and tributers have been set to work to extend the old drifts both east and west. A survey of the ground shows that the drain drift will have to be run a distance of 140 ft—90 ft in the Rocky Bar and 50 ft in the New York Hill ground, to make a connecting line of drainage through from the bed of Wolf creek. At the hoisting shaft of the Rocky Bar, the ledge keeps its usual size and good quality, and everything about the mine is running satisfactorily.

PLACER.

ITEM.—*Herald*, July 10: Mining operations in this section for the month of June have been generally favorable. Numerous prospecting operations commenced earlier in the season are showing very favorable results, and several new claims will commence work preparatory to more extensive operations at the opening of the season in the spring.

SACRAMENTO.

ITEMS.—Folsom *Telegraph*, July 19: W. H. Dolman, of Oakland, has secured a lease from the Natoma W. & Mining Co., of several hundred acres of the most favorable ground, on the American river, near Folsom, and is now getting ready to bore through the sedimentary rock at a point where it is supposed the bedrock is about 80 ft below the surface of the American river. If gravel is encountered it is the intention to drill through it until the primary bedrock is reached.

SHASTA.

ITEMS.—*Courier:* The quartz mill at the Mad Ox, seven miles above Whiskytown, is running day and night, the parties are confident of a good thing in their mine, which is well located with a large body of fine-looking quartz now in sight. The extension of this mine, known as the Peckham mine, now owned by A. Sanlan, Warfield, Scott & Co., is turning out a large amount of good quartz. It is worked by an arastra, and pays from $100 to $140 per ton; ledge from three to five and a half ft in thickness. On Mad Mule, W. Banghart is working his seam diggings very quietly, but with very satisfactory results. Since 1860 he has his new tunnel in 500 ft, and is within a few feet of his pay chimney or seam, which is very rich. Ex-Sheriff Jackson is working the extension with good prospects. The diggings have been very rich in the gulches in this vicinity in past years. The Bell & Knox mine, in Grizzly gulch, in same district, has yielded a large amount of gold during the past two years.

FRENCH GULCH.—The mining interests around French Gulch are very encouraging. Messrs. John Souter, Syme & Co. are getting the old Washington mill and mine in running order again, as they have found new bodies of ore. The quartz in this district is gold bearing. F. McGonnell and H. Dorr have a fine prospect higher up the mountain; their ledge is between slate and porphyry, rock averaging from $40 to $70 per ton, worked by an arastra right at the mine. V. Kearn is also running an arastra on the north fork of the creek with equally good results.

SIERRA.

ITEMS.—*Mountain Messenger*, July 19: Some fine-looking dust has just been brought in from Craycroft hill. Mining machinery for the Alaska mine at Plum valley has arrived, and mine will shortly be worked.

TRINITY.

DEADWOOD GULCH.—*Journal*, July 10: Passing over the mountain, from Shasta county, at an altitude of 4,100 ft, into Trinity county, we find Deadwood gulch, on which five arastras are now running—George Klein two, G. F. Deiner two, Waver Sebastian one. Mr. Willey and Mr. Davis are also working very rich ore from their mines. Ores in this district run from $70 to $120 per ton, and some have run even higher than that. This district, well located, formations slate and porphyry, the same as French Gulch district, and the gold of good quality.

NEVADA.

WASHOE DISTRICT.

CON. VIRGINIA.—Gold Hill *News*, July 23: The output of ore from the mine has been nearly doubled of late and the yield of bullion will be correspondingly increased. Four ft per day are being added to the length of the west joint crosscut, 850 level, and harder rock is encountered. Winze No. 2 on 1650 level is being reopened for ventilation. Crosscut on 2150 level is in 40 ft, cutting good vein material showing some quartz.

OPHIR.—The main incline is 135 ft on the slope below the 2300 station and still continues in a likely, vein formation, carrying streaks of low-grade ore. The east drift on the 2300 level is in most promising vein material carrying stringers of quartz and low-grade ore. The raise from the drift north of No. 1 winze is 52 ft up and in low-grade ore. The raise south has connected with stopes above.

JUSTICE.—The ore stopes on the 950 level are yielding the usual quantity of good rock, and for the past few days there has been a little improvement in the quality. Crosscut No. 2 west, 1500 level, has cut the clay and is encountering streaks of ore and nice vein porphyry mixed. The ore assays about $30. As this crosscut is advanced the formation grows stronger and better and an increase of water is encountered. Crosscut No. 3 east, on the same level, is cutting through streaks of ore which assay tolerably well.

BELCHER.—The main incline is now 150 ft, on the slope, below the 2700 station. Since the connection on the 2700 level with Crown Point, ventilation has been greatly improved. The drift south on the 2700 level will be continued along the west side of the vein to the south line of the mine. The station at this level is being cut out and timbered, which work will occupy some 10 days yet. Crosscut No. 1, 2500 level, is cutting fine-looking quartz.

ALTA.—Sinking the incline has been resumed. The south drift, 1750 level, has passed through a strong stringer of quartz and continues in vein matter without any sign of a footwall. The north drift, 1550 level, in Lady Washington ground, continues to cut clay and quartz with stringers and bunches of ore running from $5 to $11. The 350 tons of ore which crushed the old ore dump will be hauled to the mill for reduction, and when the new ore house is completed a raise will be made in the ore body from the 1450 to the 1350 level and the ore stoped out.

UNION CON.—The east drift from the main north drift, 1000 level, to connect with the Union shaft, is in 110 ft. In vein porphyry carrying an increase of water which makes progress slow.

CALIFORNIA.—The joint crosscut west, 850 level, is cutting harder rock, its face 482 ft from the initial point. On the 1950 level, preparations are going on for running a drift north from crosscut No. 1 to reach the ore stopes on that level.

UNION SHAFT.—The 1900 station is opened and connected with the drift through from the Ophir incline, 2000 level, and sinking has been resumed. From the shaft a drift has been started west on a level corresponding with the 1600 of Union Con. to meet that running on that level east from the main lateral drift. On the surface the foundation for the pump hoist is being put in and the excavation for the large pumping engine is being made.

LADY BRYAN.—The east drift, 750 level, is in 120 ft, and in softer ground. The west drift, same level, continues in hard rock. The east crosscut from the south drift is also in quartz giving low assays, and the east crosscut from the north drift is in porphyry.

SIERRA NEVADA.—The water in the incline and from the stopes has been decreasing of late very slightly. The north drift from the 2300 station is in 18 ft, showing some quartz, and chutes are being cut for this level.

TROJAN.—The drift west from that north, on the second level, is in 65 ft, and is cutting quartz and porphyry.

NIAGARA.—In the north drift the formation is hard and progress slow. These drifts have been extended 57 ft since last report.

ANDES.—West crosscut, 350 level, has cut some fine-looking quartz and found considerable water.

NEW YORK.—The crosscut on the 1200 level is penetrating quartz, and the bottom of the incline is in softer ground.

ALTA AND BENTON.—*Enterprise*, July 23: At the south end the Alta and Benton are looking well. Some very rich ore is being found on the 1350 level, and crosscutting is in progress at the 1750 level and other points. The Briggs mill is running on ore from these mines. The drift in Lady Washington on the 1550 level is beginning to get into ore.

ITEMS.—The 2100 level of the flooded mines was drained last Monday. Thus far the donkey pumps at the Hale & Norcross have not been started up, but will start to-day. The Savage folks will soon start up their third donkey pump. They are also running their big main pump. The work of sinking at the Requa shaft has been resumed and is making rapid progress. There is no water at the bottom to interfere with the operations of the workmen.

ARIZONA.

ITEMS.—*Arizonian*, July 12: The force on the Prince and Black Warrior, some 35 men, are all at work on high-grade ore, which is being packed to the Peck mill for reduction. The Warrior is opening finely, and bids fair from present development, to become the leading mine of Yavapi. The vein is large and the ore of a high grade, and there can be no doubt that as depth is attained, sufficient water will be found to run a mill. Hoisting machinery has been ordered for the Peck, and as soon as it arrives sinking the main shaft will be resumed.

TIGER.—Sinking of the main working shaft is making rapid progress, the work being done in first-class style. The stopes from the old shaft are all in fine ore. The supply of water from the mine keeps the mill steadily at work. Some 50 men are employed at the mill and mine. Besides the discovery claim on the Tiger now worked, there are a dozen others looking equally as well. Owing to the scarcity of water, operations have been somewhat impeded at the Oro Bonita. The mine is looking well.

TIPTOP.—One hundred and twenty-five men are employed at this mine, turning out the regular ore supply daily. This valuable property is showing up finely. The bottom of the main shaft—400 ft deep—is in high-grade ore. The mine is turning out about $35,000 per month. Messrs. Groom & Dunn have a fine prospect on the Pearl. The ledge is said by parties who have visited it, to equal anything in the district. The last lot of ore worked at the Tiptop mill yielded at the rate of $500 per ton.

GOODWIN.—Holmes' claim, on the Ooodwin, shows a magnificent body of rich ore nearly two ft wide, and worth $300 per ton. The Ooodwin is steadily improving as depth is reach, the vein becoming larger and the ore of a higher grade.

ITEMS.—*Sentinel*, July 10: Last Sunday's train took the third shipment from the Tombstone mill, of 10 bars, valued at $22,517.61, also 18 bars from the Tiptop mine, valued at $30,232. There was a partial clean-up at the Yuma mill last Saturday. The tailings washed from the blankets were not cleaned, and from assay are supposed to contain about $1,000. We are told this partial clean-up gave a result of about $10 per ton, which, considering the very small expense of mining and working, is very satisfactory.

ITEM.—Globe *Silver Belt*, July 18: The owners of the Manzanita made a working test of a ton of ore without selecting which gave returns of $27.65, worked out with a rudely constructed arastra. In the Chamberlain mine the development so far, is shaft No. 1, sunk on the north-east end of the claim 40 ft, from the bottom of which there is a level run southwest 40 ft, which exposes to view a vast body of high-grade ore three and one-half or four ft wide nearly the entire length.

BRITISH COLUMBIA.

CASSAIR MINES.—The latest advices from the Cassair mines, dated Victoria, July 22d, are of a more encouraging character than any that have been received for some time past. Many of the claims on Defot creek are paying well, and from one of them two handsome nuggets, weighing respectively 45 ounces and 15 ounces, were recently taken out. A letter dated Fort Wrangel, July 10th, states that Mr. J. Galbraith had arrived at that place with $15,000, and Johnson, the express carrier, with $16,000. Leiser & Co. had also made a shipment of some $12,000. It is stated, on good authority, that more money has come out of the mines this season than was taken out during the

[CONTINUED ON PAGE 60.]

The Absorption of Hygroscopic Moisture by Cereal Grains.

[Graduating Thesis of EDMOND O'NEILL, College of Agriculture, University of California.]

It is well known that all substances absorb moisture from the air. The effect of this is seen in the swelling and curling of animal and vegetable substances. This is the principle on which cat-gut and horse hair hygrometers are constructed. The moisture thus attracted, is deposited in an exceedingly thin film, not apparent to the eye or to the touch. Even substances like polished metals and glass are thus covered with an invisible coating of moisture, as is made apparent by weighing the glass, wiping it with a dry cloth, and again weighing. The second weight is invariably the smaller, owing to the removal of the film. On standing, more moisture is attracted, and it resumes its former weight. The presence of this film may also be shown by writing on the glass with any object. This will remove the film, and, on breathing on the glass, the writing will become apparent, on account of the amount of condensed moisture being less on the places where the film was removed. This phenomenon is often a cause of considerable error in weighing large pieces of apparatus.

The cause of this absorption is the physical attraction between the aqueous particles and the particles of the substance. If the substance be either porous or capable of entering into chemical combination with the water, much more will be absorbed than in the case of glass. A porous substance, like brick or charcoal, will increase in weight many times more than a piece of glass of the same size, merely on account of the larger surface. Some substances, like nitrate of sodium, or chloride of calcium, will continue to attract moisture until they form a liquid. Substances like sulphuric acid and phosphoric anhydride, which form a chemical combination with the water, will attract every particle of moisture from a limited volume of air, as a new surface, capable of attraction and combination, is always presented.

Grains, seed, flour, cloth and even oils, absorb considerable amounts of water. In Europe, valuable substances like silk and wool are always sold with an allowance for contained moisture. The temperature and humidity of the atmosphere are observed, and, by means of tables previously determined by experiment, the amount of water in the silk obtained. It is often considerable at 55° Fahr., being about 15% (Knop.). This absorption property is of great importance in the case of soils. Davy maintained that the fertility of a soil was proportional to its hygroscopic power. This, however, is not always true. The absorbent power is generally proportional to the porosity or fineness of division. According to Schubler, coarse, silicious sand, exposed to a saturated atmosphere, absorbed nothing in 72 hours; fine calcareous sand, three-tenth per cent; clay, 8%; and humus, 12%. This shows the effect of fineness of division; but soils containing humus and clay are generally fertile, which explains Davy's proposition.

In California, this absorptive power is practically noticeable in the case of the cereal grains. The bulk of these crops are raised in the interior of the State, and generally stored there for some time. The climate in summer is extraordinarily dry, and the grains will give up nearly every particle of moisture. When removed to San Francisco and stored in damp warehouses, or shipped to a foreign port in the hold of a vessel, where the atmosphere is nearly saturated, the weight is materially increased. It has been said that this additional weight will pay the entire cost of freight from San Francisco to Liverpool.

This absorbent power has been noticed very often, especially in California. A writer in the *Pacific Rural Press* mentions the fact that the lower sacks stored in a warehouse gain a considerable amount. The reason that the lower ones gain more, is that the moisture, which generally comes from below, is almost completely absorbed by these lower layers, none being left for the upper ones. Another person mentions that the outside sacks of a pile of freshly threshed grain standing in the field for 10 days weighed 30 pounds less than the inner sacks. Freshly threshed grain always contains moisture, and it was the loss of this which caused the difference. The time, being only 10 days, was not sufficient to allow the inner layers to dry out. Several other instances have been noticed and they all agree that the grains may gain or lose a very large amount in a comparatively short time.

As many inquiries have been made as to the actual amount that could be gained or lost, and to whom the profit went, experiments were made to determine these points. It would be very important to the farmer to know whether it would be profitable to store his grain, or to sell it off the field; whether the commission merchant should take the farmer's weight, or to weigh it himself in San Francisco. All these points are of the greatest practical importance to the grain raisers of the State.

The amount of absorption may be measured in several ways. Among the oldest and not very accurate ones are those of Leslie. The substance was dried at as high a temperature as possible without changing it, placed in a flask with a small opening, and the whole exposed to a saturated atmosphere. The amount of moisture in the small flask was measured by means of a delicate hygrometer, and this was assumed to be proportional to the amount absorbed by the substance. In this way he obtained the relative absorptive powers of a great many substances.

Schubler's method was to place the substance, previously dried at a temperature of 100°—200° C., on a small table standing in water, and to cover the whole with a bell-jar. The increase of weight indicated the amount of water absorbed.

The defects of this method were, that the layer of substance was too thick, the time of exposure not long enough, and with his appliances the atmosphere not fully saturated. This latter was proved by Knop, who showed that moistened filter paper loses weight when exposed to an atmosphere like that employed by Schubler.

The method adopted by me was Schubler's, as modified by Prof. Hilgard. The bell-jar was made as low as possible, and filter paper, dipping into the water below surrounded the substance, which was spread out in as thin a layer as possible. Even with these precautions, the grain will continue to absorb for a period of from 12 to 18 days.

Since temperature changed the amount of water in a saturated atmosphere very much, the apparatus was placed in a room where the temperature was constant, about 18°.

Experiments according to this method were made with wheat, barley and oats. About 25 grammes of each were employed, spread out on large watch-glasses. The weighings were made in a corked flask, as the grain lost weight rapidly when removed from the apparatus. The absorption was accompanied by considerable swelling, which, however, was not measured.

The following table shows the percentage of moisture absorbed by air-dry substances from a saturated atmosphere, the temperature being 18° C.:

	Oats.	Differences.	Barley.	Differences.	Wheat.	Differences
8 hours....	3.80	7.79	3.52	7.00	3.26	6.56
15 hours....	5.00	.56	5.54	.54	4.11	.46
24 hours....	7.70	1.85	7.00	2.54	0.56	1.5
48 hours....	8.85	1.20	7.54	1.70	7.02	1.2
64 hours....	9.53	1.00	8.68	1.30	8.00	1.3
5 days....	12.43	1.00	11.44	1.30	10.05	1.7
5½ days....	12.68	.97	....	1.27	....	1.3
7 days....	14.37	.50	14.00	.60	13.05	.26
9 days....	15.21	.34	15.10	.50	14.18	.25
12 days....	17.35	.82	18.32	1.21	17.40	1.2
14 days....	17.88	.71	19.70	1.34	18.79	1.0
15 days....	18.57	.60	....	1.01	....	1.2
18 days....	19.76	.32	20.38	.43	....	.27

The differences are for periods of 24 hours each.

We see that although the total amounts absorbed by these grains differ slightly, yet they seem to follow the same general law, *i. e.*, a gradual increase, at first very rapid and then slowly becoming less until about the 13th or 14th day, when a sudden increase occurs. This is due to the development of mold owing to the great amount of moisture present. Nearly half the total increase occurs in the first 24 hours, and most of it in the first part of this time, as shown below. Difference between grains during the first 24 hours:

	8 hours.	15 hours.	24 hours.	14 days.
Oats	3.80	1.20	2.79	10.1
Barley	3.52	2.02	1.46	12.7
Wheat	3.26	.84	2.45	14.23

In the second 24 hours scarcely anything was absorbed. This was probably due to a sudden change of temperature.

Experiments were also made to determine the amount of water in the air-dry grains. They were exposed to a perfectly dry atmosphere at 18°. The apparatus employed was a common sulphuric acid dessicator. The grains, especially the wheat, shrank very much and became hard and bony. The results were as follows. The table of differences as before refer to periods of 24 hours: Percentage of water lost by air-dry grain exposed to absolutely dry atmosphere at 18° C.:

	Oats.	Differences.	Barley.	Differences.	Wheat.	Differences.
2 d'ys.	4.45	3.00	3.39	2.00	3.11	2.00
		1.45		1.39		1.11
3 d'ys.	5.67	1.22	4.41	1.02	4.18	1.07
		.36		.8		.45
4 d'ys.	6.53	.42	5.20	.31	4.63	.35
		.48		.35		.20
5 d'ys.	6.05	.36	5.51	.28	4.98	.11
		.35		.24		.07
6 d'ys.	7.43	.20	5.86	.20	5.00	.05
		.19		.21		.03
7 d'ys.	7.99	.16	6.14	.20	5.11	.28
		.13		.10		.05
9 d'ys.	7.14	.12	6.55	.16	5.18	.20
		.12		.12		.18
11 d'ys.	8.53	.11	6.96	.12	5.46	.18
		.10		.10		.14
12 d'ys.	8.60	.09	7.13	.09	5.51	.01
18 d'ys.	9.32	....	7.79	....	6.23	....

There is a gradual decrease, more rapid at first, as seen by the column of differences. About half is lost in the first two days.

According to the above determination, perfectly dry grain, exposed to a saturated atmosphere, will absorb the following amounts, at a temperature of 18° C.:

Oats	29.08%
Barley	28.17%
Wheat	25.02%

Wheat is thus seen to be less hygroscopic than oats or barley. Perhaps this is owing to the chaff of the latter.

As the temperature of the interior of the State in summer is about 80° F., the experiment of drying the wheat at this temperature was tried. The grain was placed in a flask, which was kept at a temperature of 30° C., by means of a water bath, and dry air passed over. The results were as follows:

Temperature.	Time of exposure.	Percent. lost.
18° C.	18 days=432 hrs.	6.23
30° C.	30 hrs.	7.65

This shows that an increase of temperature increases the amount of moisture lost and decreases the time. According to Knop, wheat, dried at 120°, loses 14.6% of water.

The air even in the interior is never fully saturated. According to Logan the average dew point of the Sacramento valley in summer is 50, the temperature being about 70° F. This shows that the air contains 39.39% of moisture. The annual average dew point is 48, the temperature being 61° F. This corresponds to 52% of moisture. Experiments were made with air of this degree of situation. This was done by means of a solution of chloride of calcium. According to Gay Lussac the tension of aqueous vapor formed by a solution of chloride of calcium of the specific gravity 1.343 at 10° C., has a tension of 50.5, the tension of aqueous vapor in a saturated atmosphere being taken at 100. In other words the air above such a solution is half saturated. Since a solution at 180° (the temperature used) is less dense than at 10°, a correction must be made. It was assumed to decrease in the same ratio as water, and, therefore, a solution of specific gravity 1.3418 was employed. Wheat was placed over this and surrounded by filter paper as before. The amount absorbed by wheat dried at 30° C., from a saturated atmosphere and from a half saturated one, is shown below.

Amount absorbed in 12 days, temperature + 18° C.:

Above solution of Chloride of Calcium	3.40%
" " " Water	22.9 %

This result shows that half saturated air acts almost like dried air, and, therefore, that wheat from the Sacramento valley may be considered as being almost absolutely dry, and hence capable of taking up 20% or more of moisture.

We can now see what an important factor this absorption of moisture is in the case of grains. The great bulk of our wheat may be considered as dry during the summer, and on transportation to a damper climate may possibly increase 25%, and a gain of 5% to 15% may be looked for with almost absolute certainty. This is clear profit, and might just as well be appropriated by our farmers as by the commission merchants or foreign dealers.

Further experiments are necessary to determine the amount of moisture in newly threshed grain, and the rapidity with which it is lost when stored in the field and warehouses during summer; the effect of one-quarter, three-quarters or other intermediate degrees of saturation; the influence of large and small piles; and whether the difference of absorption of different grains is not due to the chaff. The determination of these points and also the degree of saturation of the air of the warehouses of San Francisco and large grain regions, will enable us to estimate the amount of moisture absorbed by the cereal grains very accurately.

The Age of Wonders.

A recent English writer, reviewing the scientific and industrial achievements of the past half century, calls this "the age of wonders," and refers as follows to a few out of the many modern marvels that fully justify the appellation:

We have seen a substance which our ancestors proudly used to obliterate a pencil mark so molded to our use as to make man almost an amphibious animal; a noxious vapor, from which they would turn with disgust, made the means of a brilliant light, which enables the night almost to rival the day. We have seen the surgeon's knife, to them an instrument of necessary torture, divested of its horror by a discovery which gives a temporary insensibility to pain, which enables the suffering patient to wake from nothing more than a troubled dream, and find that over, under which, without this, his fortitude might have faltered, or his constitution sunk. We have seen a power which is inexhaustible so long as the elements of fire and water remain, the effects of which our grandmothers may have witnessed with a sigh, when terminating, by a sudden crash, the serene music of their tea-kettles; but which, by the combined efforts of modern science, has become the very hands and feet of the world, the great and almost universal manufacturer for man; the great propeller by which we rival the flight of the bird, and which so unites the human family that degrees of latitude and longitude are little more than milestones on the great highway of the world. And, lastly, we have seen that subtle power which our ancestors recognized only in the minute spark of the electric circle transformed into the faithful, untiring agent of the human mind, bearing its thoughts from one end of a vast continent to the other with an accuracy which would be in vain looked for in any other messenger, and with a speed which far outstrips the action of the mind which formed them. "Quick as thought" will not do now to express the greatest speed, and "quick as lightning" has become a practical, not merely a figurative expression.

FROM March 8th to July 7th, $25,231 in gold was received from a private gravel claim at Iowa Hill, Placer county. This claim is owned and worked by a retired merchant of San Francisco, and is only a single illustration of what a little capital, judiciously invested in gravel claims, will accomplish.

San Luis Park, Colorado.

From Gov. Gilpin's article in the *Colorado Miner* we learn that the San Luis park is an immense elliptical bowl, the bed of a primeval sea which has been drained; its bottom, smooth as a water surface and concave, is 9,400 square miles in area. It is watered by 35 mountain streams, which, descending from the encircling crest of snow, converge, 19 into the San Luis lake, the rest into the Rio del Norte. An extraordinary symmetry of configuration is its prominent feature. The scenery, everywhere sublime, has the ever-changing variety of the kaleidoscope. Entirely around the edge of the plain, and closing the junction of the plain with the mountain's foot, runs a smooth glasis, exactly resembling the sea beach, which accompanies the conjunction of the land with the ocean. From this beach rise continuously all around the horizon the great mountains, elevating their heads above the line of perpetual snow. On the eastern side the escarpment of the Cordilleras rises rapidly, and is abrupt; on the western side the crest of the Sierra Mimbres is more remote, having the interval filled with ridges, lessening in altitude as they descend to the plain of the park.

This continuous shelving flank of the Sierras completing a perfect amphitheater, has a superficial area equal to that of the plain which it envelops, and gives to the whole enclosure within the encircling band of snow an area of 18,000 square miles. At an elevation of 5,000 or 6,000 feet above the plain a level line upon the mountain wall marks the cessation of arborescence, and above which naked granite and snow alone are seen. To one who ascends to this elevation from any point, the whole interior of this prodigious amphitheater, displaying an elliptical arc of 11,520,000 acres, is scanned by the eye and swept in at a single glance. Aided by a glass, the smallest objects scattered over the immense elliptical area beneath are discernible through the limpid, brilliant and translucent atmosphere. Two facts impress themselves upon the senses; the perfect symmetry of configuration in nature, and the intense variety in the form and splendor of the landscape.

The average elevation of the plain above the sea level is 6,400 feet. The highest peaks have an altitude of 16,000 feet above the sea. In the serrated rim of the park, as seen from the plain projected against the canopy, are discernible 17 peaks, at very equal distances from one another. Each one differs from all the rest in some peculiarity of shape and position.

The park is an immense elliptical basin enveloping the sources of the Rio del Norte. It is isolated in the heart of the continent, 1,200 miles from any sea. It is mortised, as it were, in the midst of the vast mountain bulk, where, rising gradually from the oceans, the highest altitude and amplitude of the continent is attained. This park spreads its plain from 36° to 38° 30', and is bisected by the 106th meridian. Its greatest length is 210 miles; its greatest width is 100 miles; its aggregate approximate area is 10,000 square miles.

The comb of the Sierra, surrounding this immense bowl, presents the prodigious plates of primeval porphyry driven up, as the subsoil of a furrow, from the lowest terrestrial crust and protruding their vertical edges toward the sky.

The summit, yielding to the corroding forces, presents a wedge towards the canopy, is arranged in peaks resembling the teeth of a saw, is above all arborescence, and is either clad in perpetual snow or is bald rock.

Against this is lapped perpendicularly the second stratum, less by many thousand feet in altitude, its top forming a rim or bench. This bench, being the rended ridge of the erupted stratum, softer than the first and receiving the debris from above, has a deep fertile soil, a luxuriant alpine vegetation, forests of fir, and is the highest region of arborescence and vegetable growth.

This is the region of rocks, where the metals, especially gold and silver, abound in crevices charged and infused with the richest ores. It is from hence that the gold of the gulches is disintegrated and descends. Here are springs of water and the sources of rivers. The timber is excellent, and the pastures of various grasses luxuriant and inexhaustible. Swept by the ascending currents of vapor, irrigation is constant. This elevated bench is a permanent characteristic of the mountain flank, continuous as the continent itself; a colossal staircase, whose steps are themselves of mountain magnitude.

The enveloping Sierras, which hoop in the park in an unbroken circuit, have 1,000 miles of length. The cloud compelling crests, throughout and continuously, reaches and ascends into the region of perpetual snow. The veins of gold and silver-bearing rocks average all along 10,500 feet in altitude. They have a like continuous and undeviating length and circuit.

These veins are crossed and scored by 100 and more considerable streams, descending through them from the snows above. These all concentrate into the bowl of the park beneath. The channels, their confluent waters, and the sands from the full-veined mountains flanks, are here stopped and accumulate. The abrasions, going on during countless centuries, are here concentrated; they are gathered and remain upon the bedrock underlying the abraded debris.

The profound and subtile scrutiny given by Humboldt to the South American Andes is systemized in volume V. of *Cosmos* under the definition: "The reaction of the interior of the

earth upon its crust." He defines and often reiterates certain facts of generalization in their structure and contents. These illuminate and economize the intensely active fever now agitating our people in their search for the precious metals, and other precious contents of our North American Andes.

Two Cordilleras, imperfectly parallel, traverse South America from Cape Horn to Darien. These Cordilleras, are, comparatively, in quite close proximity. They seem at long intervals to cross, to intermingle their peaks, and to become mixed together. They are, nevertheless, distinct throughout. They contain between them a plateau depressed below the snow line. This is in Peru defined as the Puna.

Similar to our Northern Andes, the Eastern Cordillera, is the continuous crest that divides the drainage into the Atlantic ocean and into the Pacific ocean.

A special and peculiar characteristic of this dividing Cordillera, everywhere thus identifying it from all other mountain chains, is outflanking and parallel walls of trap dykes. These trap dykes issue from a depth more profound than the material of the Cordillera held between them. They are scrupulously parallel to one another, and are from 30 to 50 miles asunder.

The tops of the trap walls protrude through at an elevation of 10,500 feet above the sea. It is at this altitude, and packed against the four faces of the flanking trap walls, that the precious ores of gold and silver (chlorides and carbonates) are found to rest in nature as wall paper used in the parlors of ordinary dwellings. This is the altitude and outcrop of the mines of Copiapo in Chile, of Potosi in Bolivia, of Cerro Pasco in Peru, of El Doctor in Equador, and at Pachincha. All of these mines approach an uniform altitude of 10,500 feet.

The same law holds throughout the North American Andes from Darien to Behring's straits. The Cordillera is longitudinal in direction; uniform in structure, in rocks and in contents throughout its whole length of 12,000 miles from Cape Horn to Behring's straits.

It is from the above enumerated mines of the Southern Andes that the whole world has obtained its chief supply of silver for the past three centuries. This enormous production is now shifted into, and has its activity along, our counterpart North American Andes and within the territory of the American people.

The Sierra Mimbres, forming the western envelope of the park, is not dissimilar to the Cordillera in its origin, composition or configuration. Rising from the level of the great plateau, it is of inferior bulk and rank. It forms the backbone from whose contrasted hanks descend the waters of the Rio del Norte on the east and the Rio Colorado on the west.

Craters of extinct volcanoes are numerous; streams of lava, once liquid, abound; pedigrals of semi-crystalline basalt submerge and cover the valleys, into which they have flowed and over which they have hardened.

This Sierra, then, has a general deflection from north to south, corresponding with the 109th meridian. It has all the characteristics in miniature of the Cordillera, but is chequered and interrupted by the escape of subterranean fires, having areas overflowed and buried beneath the crupted current. Where the nascent springs of the Rio del Norte have their birth, the Sierra Mimbres culminate to stupendous peaks of perennial snow, locally named Sierra San Juan.

The middle region of the plain, longitudinally, displays a crater of the most perfect form. The interior pit has a diameter of 20 miles, from the center of which is seen the circumferent wall forming an exact circle, and in hight 500 feet. This wall is a barranca, composed of lava, pumice, calcined lime, metamorphosed sandstone, vitrified rocks and obsidian. This circumferent barranca is perforated through by the entrance and departure of the Rio del Norte, the Culebra and the Costilla rivers, which traverse the northern, western and southern edges of the interior. By this and other forces of corrosion this barranca is, on three sides, cut into isolated hills, called cerritos, of every fantastic form and of extraordinary beauty of shape and tints. The bottom of the crater has been filled with the soils resulting from the decay of this variety of material, introduced by the currents of the water and of the atmosphere. It is leveled by these forces to a perfect level, is of the fattest fertility, and drained through the porous formation which underlies it.

From this crater to its southern rim, a distance of 65 miles, the park expands over a prodigious pedigral, formed from it in the period of volcanic activity. The pedigral retains its level and is perforated by the Rio del Norte, whose longitudinal course is confined in a profound chasm or canyon of perpendicular walls of lava, increasing to the depth of 1,200 feet, where it debouches from the jaws of this gigantic flood of lava, near the village of La Joya, in New Mexico. Such are the extraordinary forms and stupendous dimensions with which nature here salutes the eye and astonishes the imagination. The expansion of the lava is all to the south, following the descent toward the sea. Toward the north, repelled by the ascent, are waves demonstrating the defeated effort to climb the mountain base.

THE *Nevada Herald* says: The Live Yankee mine, near the Thomas, is to be another prominent institution from present appearances. At a depth of 125 feet the ledge has increased until it is about five feet thick, and miners, who ought to know, think the rock will pay from $40 to $50 per ton.

USEFUL INFORMATION.

POISON FOR RATS AND MICE.—Carbonate of baryta has been found to be a most efficient poison for rats and similar vermin. Indeed, at a special series of trials by the Zootechnical Institute, in connection with the Royal Agricultural College, at Proskaw, this substance was found to be more efficacious than any other. It occurs as a heavy white powder, devoid of taste or smell. In the Proskaw experiments it was mixed with four times its weight of barley meal, and pellets of the paste were introduced into the holes of the rats, house mice, and field mice. A small quantity proves fatal. It appears to cause immediate and complete paralysis of the hind extremities, so that it may be assumed that mice eating of it in their holes will die within them, and so not prove destructive in their turn to domesticated animals that might otherwise devour the carcasses. It was found in practice that neither fowls nor pigeons would touch the paste, either in its soft state or when hardened by the sun; so that its employment is probably free from danger to the occupants of the poultry yards. Some rabbits, on the other hand, that got access to the paste ate heartily of it and paid the penalty with their lives. Next to the carbonate of baryta paste, the ordinary phosphorus paste proved most destructive, and this, it was found by experiment, is more attractive to the mice in a soft form than when hardened into pills. But it is considerably dearer than the baryta preparation, an important factor in the calculations of the farmer who has to wage war against rodents on an extensive scale.

GLUE.—Carpenters should remember that fresh glue dries much more readily than that which has been once or twice melted. Dry glue steeped in cold water absorbs different quantities of water according to the quality of the glue, while the proportion of the water so absorbed may be used as a test of the quality of the glue. From careful experiments with dry glue immersed for 24 hours in water at 60° Fah., and thereby transformed into a jelly, it was found that the finest ordinary glue, or that made from white bones, absorbs 12 times its weight of water in 24 hours; from dark bones, the glue absorbs 9 times its weight of water; while the ordinary glue, made from animal refuse, absorbs but 3 to 5 times its weight of water.—*Building News.*

FORMATION OF COAL.—E. Fremy holds that there are several kinds of isomeric cellulose, constituting the skeleton of plants. Coal is not an organized substance. The vegetal impressions presented by coal are produced as in shales or other mineral matters. The chief substances contained in the cells of plants under the double influence of heat and pressure produce bodies having a great analogy to coal. The pigments, the resins, and the fats of leaves, if submitted to heat and pressure, yield compounds which approximate to bitumens. The vegetable matter which gave rise to coal has undergone, first, the peaty fermentation, the coal being then formed by a secondary transformation.

FLUORESCENCE.—J. L. Soret has already pointed out the beautiful violet fluorescence of solutions of cerium sulphate and chloride elicited only by the extreme ultra-violet rays of the induction spark, the solar rays not being sufficiently refrangible for its production. He has since found that the solutions of many salts of the earthy metals possess analogous properties. He enumerates lanthanum chloride, didymium chloride and sulphate; terbium, yttrium, erbium, ytterbium chlorides; philippium chloride; thorium sulphate; zirconium sulphate and chloride; aluminum and glucinium chlorides.

STRAIN ON PIANOS.—The strain on 7⅓ octave large concert grand Steinway & Son's piano is 66,000 pounds. Parlor grands of the same make average 30,000 pounds strain each; and upright pianos, having also three strings to each note, from 20,000 to 25,000 pounds, according to size; the square grand pianos, 7⅓ octave, being partly three-stringed to each note, about 20,000 pounds; 7 octave square pianos, two strings to each note, about 16,000 pounds each.

BRASS CASTING FROM OLD METAL.—A white scum of oxide sometimes forms very rapidly, and going into the molds with the metal makes the castings porous and rotten, especially is this the case when old metal is used. To prevent, stir the molten metal well with a stick of green wood, and sprinkle with a little dry argol and sal ammoniac before pouring.

SOLID EMERY WHEELS.—Many of the best wheels are cemented with vulcanized rubber, borax or zinc chloride (or oxychloride) and barium carbonate; other materials, such as feldspar and clay, alkaline silicates, litharge and japan, shellac, and other resinous and gummy matters, albumen and lime, etc.

TARTAR EMETIC IN DYEING.—Dr. Reimann advises those engaged in cotton dyeing to discontinue the use of tartar emetic. It does not fix the aniline colors themselves, but merely fastens the tannin, and as antimony can be dispensed with there is no reason why health should be endangered.

TO INSULATE WIRE.—Shellac varnish makes a good insulator for wire, provided the wire is wound before the varnish becomes thoroughly dry.

TO PRESERVE NATURAL LEAVES.—The fresh leaves are spread and pressed into a suitable dish with alternate layers of fine, thoroughly dry sand, as hot as the hand can bear. When the sand has cooled they may be removed, smoothed, and dipped for a few moments in clear French spirit varnish, and allowed to dry in the air. By many melted white wax is preferred to varnish. This latter must not be too hot. The dried leaves are dipped in the melted wax, drawn several times over the edge of the vessel to remove excess, and hung up until the film of wax is thoroughly cooled and hardened.

PROTECTING VULCANIZED RUBBER.—To protect vulcanized rubber against the action of oils and fats, Herr C. Schwanitz, Jr., of Berlin, works in the rubber by rolling through heated rollers a mixture of 6 pounds of prepared chalk, 3.2 ounces of sulphur, 1.67 ounces of litharge and 1 pound of glycerine of 1.23 specific gravity. In order to vulcanize articles made and shaped from this material, they are placed in a bath of glycerine, and all exposed to a pressure of steam of two to three atmospheres.

GUTTA-PERCHA SOLVENTS.—Caoutchouc and gutta-percha are both quite soluble in naphtha, benzole and carbon disulphide. The latter, when mixed with about 6% of absolute alcohol, is one of the best solvents. The solution is performed in the cold (best in the open air), as it would not be safe or economical to heat these volatile and inflammable liquids. Exposed to the air the solutions soon evaporate, leaving the gums in their original condition.

INDELIBLE INK.—The *Apotheker Zeitung* gives the following formula: 1.75 grammes aniline black are ground up with 60 drops hydrochloric acid and 42 grammes alcohol, and the liquid is diluted with a hot solution of 2.5 grammes gum arabic in 170 grammes water. If the aniline black solution is diluted with a solution of 2.5 grammes shellac in 170 grammes spirit instead of gum water, the result is an ink suitable for writing on wood, brass or leather.

DYED COCOONS.—A Spanish silk spinner has hit upon the ingenious idea of adding dyes to the warm water which is used for detaching the silk fibers from the cocoon, and thus to dye the fiber as it is being formed into thread. His object is to obtain a dyed thread which is to contain all the natural gum and luster, and which, on that account, will retain the color more easily and readily.

LIME WATER.—Agitate an ounce of pure caustic lime in a pint bottle nearly filled with water, and after the lime has subsided decant the clear supernatant liquid. It must be kept in well stoppered bottles.

GOLD IN PETROLEUM.—According to the *Bergmann*, Mr. J. Turnbridge has extracted $34 worth of gold from a ton of the residues from petroleum stills. The source of the petroleum was not ascertained.

GOOD HEALTH.

Epidemics.

The limitation of epidemic pestilential diseases, as the yellow fever, typhus and typhoid, diphtheria, etc., is at all times a question of intense interest to every thoughtful person. The July number of the New York *Sanitarian* contains interesting and valuable matter upon the subject of epidemics, which we unhesitatingly appropriate:

The cholera is a product of the jungles of India and Burmah, and the yellow fever is as surely of West Indian origin. That it is an exotic as relates to the United States is the opinion of the last national commission; and that it never originates *de novo*, except in its primal birth-place, whatever elsewhere may be the excess of heat moisture, filth, and vegetable and animal decomposition, is almost demonstrated, perhaps established. As to communicability, it is certainly conveyed from individual to individual, not precisely by what we understand to be direct contagion, but through various media, especially by bed and body clothing, by articles of furniture, by apartments, cars and steam and sailing vessels, by baggage and by cargoes; and these propagators, deriving from the sick the pestilential material (intentionally not called germ), hold it with wonderful tenacity, and convey it to mankind with intense effect. Both may be held at bay by quarantine and literally "fenced out." In 1851 cholera prevailed in Southern Europe and in Algeria, but not one case occurred that year in Spain by reason of vigorous quarantine. Two years later, when the embargo was not strictly maintained, it ravaged the Spanish peninsula. It always followed the lines of travel and was always carried by mankind. The infectious germ might be long in germinating, but it could always be traced to individuals. Quarantine, to be effectual, however, must have a very wide applicability. It will not suffice to limit it to vessels from foreign ports. It must extend to all conveyances for the transportation of passengers and merchandise—must have relations with municipal, State and national authority. It is estimated that the cost of the late yellow fever epidemic in loss amounted to $200,000,000.

Typhoid fever is certainly communicated through a tainted water supply exposed to the taint of infected vaults. Poisoned springs have been traced to this infection, and in a celebrated English dairy case, where poisoned milk was claimed to have been sold, scientific examination disclosed the fact that the milk had been contaminated through the cows having lain upon ground manured from infected vaults. Another source is in the ice supply, often taken from shallow ponds in the neighborhood of large cities, freezing not destroying the germ as supposed. The air in localities becomes contaminated from sewage deposits; and Budd states, as early as 1859, that the germ of this disease never originates *de novo*, but proceeds from a special and specific poison, capable of great diffusion and preserving its noxious qualities for a long period, even if buried for many months. In England the preventability of typhoid fever is so thoroughly established that an innkeeper who has a guest ill with it, is held criminally responsible if any other case could be traced to the one under his roof. By this means infectious substances are destroyed and the spread of the disease prevented. Boiling water applied to the discharges is said to destroy the infection. But when the substance is allowed to escape as sewage it must be disinfected by prompt means.

Diphtheria is much more prevalent and much worse in localities supplied with bad water. The microscope can detect a few of the germs of epidemic diseases either in the water or in the system, and the only sure method is to watch the slightest approaches of disease and investigate the sources of our water supply, whether in city or country. Chlorine gas, from recent experiments, seems to be a disinfectant as well as a deodorizer. This greenish-colored gas effectually seizes upon and destroys any hidden germs existing in dwellings, ships, etc. This gas has been used successfully at Bellevue hospital and other places. We must purify and quarantine. Mediums of communication have been made available to epidemics as well as to mankind in his business affairs.

WRITER'S CRAMP.—Dr. George M. Beard, in a paper on "Writer's Cramp," published in a recent number of the *Medical Record*, concludes, from a study of 125 cases, that "this disease occurs mostly in those who are of strong—frequently of very strong—constitutions, and is quite rare in the nervous and delicate; and when it does occur in those who are nervous, is easier relieved and cured than when it occurs in the strong." That it "is far less likely to occur in those who do original work, as authors, journalists, composers, than in those who do routine work, as clerks, book-keepers, copyists, agents, etc. Like all nervous diseases in this country, it diminishes in frequency as we go South." It is no longer an incurable disease, electricity and massage being the best remedies. Hygienic measures consist of ring penholders, so as to relieve the thumb and fingers; large penholders, or fastening a piece of sponge to the penholder, so that the muscles may be less restricted; changing the hold of the pen between different fingers; the use of quill or other flexible pens, or pens with broad points, which run easily, like quill pens, and taking pains to avoid too long confinement in one position.

PRESENCE OF MIND.—Prof. Wilder gives these short rules for action in cases of accident: For dust in the eyes, avoid rubbing; dash water into them. Remove cinders, etc., with the round point of a lead pencil. Remove insects from the ear by tepid water; never put a hard instrument into the ear. If an artery is cut, compress above the wound; if a vein is cut, compress below. If choked, get upon all fours and cough. For light burns, dip the parts in cold water; if the skin is destroyed, cover with varnish. Smother a fire with blankets, etc.; water will often spread burning oil and increase the danger. Before passing through smoke take a full breath, and then stoop low, but if carbon is suspected, walk erect. Suck poison wounds, unless your mouth is sore; enlarge the wound, or, better still, cut out the wound without delay, holding the wounded part as long as can be borne to a hot coal, or end of a cigar. In case of poisoning, excite vomiting by tickling the throat or by water and mustard. In case of opium poison, give strong coffee and keep moving. If in water, float on the back, with the mouth and nose projecting. For apoplexy, raise the head and body: for fainting, lay the person flat.

THE FLUIDS OF THE BODY.—Prof. Jager, of Leipsic, has recently published a work in which he maintains that an increased proportion of water in the tissues and humors of the body is one of the most essential conditions of liability to disease. To guard against disease, therefore, it is necessary to make the body yield as much water as possible through skin and lungs, and to avoid all that favors the accumulation of water. To this end he recommends the wearing of close-fitting woolen clothing throughout the year; all bodily movements which promote perspiration; on outbreak of disease the use of vapor or sweating baths, of drinks that excite perspiration, and of foods that do the same; constant ventilation of sitting and bed rooms, so that the moisture of the air may not become great. Dr Jager asserts that the specific gravity of a living body is an accurate criterion of the strength of constitution of a man or a domestic animal—that is to say, for its capability of resistance to causes of diseases, such as chills, infection, etc., and its power of work, bodily and mental.

MINING AND SCIENTIFIC PRESS.

W. B. EWER.....SENIOR EDITOR.

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SAN FRANCISCO:
Saturday Morning, July 26, 1879.

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The Week.

Our weekly chronicles are without events calling for special notice. The mining interests of the coast are, as a whole, being well prospered. The Comstock mines are making less bullion than could be wished, but elsewhere the production is being well sustained. With the hydraulic miners of California, the water season, after being prolonged beyond expectation, is in most localities drawing toward a close. Clean-ups, now in order, promise to be satisfactory, and in some cases unusually large. The mining prospects of Alpine county, for many years obscured by reverses, are reported as having undergone marked improvement of late, considerable Eastern capital having come to their aid and some very encouraging ore developments having been made. The Robertson process, without having yet achieved anything determinate of its value, seems to have gained favor in some localities, where it has treated small lots of ore with apparent success. We await the results of larger workings and more crucial tests. The managers of the large mines at Eureka, Nevada, threaten, in the event of their being unable to obtain charcoal on satisfactory terms, to send their ores to California for reduction, a procedure which, while it might prove economical to them, would prove a great detriment to the town and wholly ruin the charcoal burners, who would be left without a market for their coal. After all the talk about the people of the East growing emotional over our mines, they seem to be taking matters coolly, their investments being made with caution and their enthusiasm being of a very subdued kind. It is hoped that when the torrid season is over they will warm up to the business, and evincing a more lively appreciation of the many opportunities offering for investment, lose no time in improving the same.

It is reported that Madame Elizabeth Patterson-Bonaparte is to have a $4,000-tomb at Greenwood cemetery,

Over-Exacting.

From the reports of parties lately returned from the Atlantic slope we judge there is in the larger towns there no lack of adventurers from the various mineral districts of the far West, all bound on errands connected with the sale of mines, the raising of capital for working purposes and similar objects. While this class has representatives in all the considerable towns and places of popular resort, the most of this army of vendors, negotiators and promoters make their headquarters in the city of New York, as being the most active center of business and capital. Contrary to the general impression it would appear that the schemes and properties so being presented for the consideration of Eastern investors, though very numerous, are hardly ever wholly devoid of merit. So much have the people abroad suffered through hasty and ill-advised mining investments on this coast that they have become exceedingly chary in their purchases, refusing to touch anything until doubly assured that it is in all respects legitimate and safe. To float there anything absolutely worthless is now impossible. A mining property will not even be noticed without something to recommend it in the first instance, and before any money will be put into it, it must, in the absence of a satisfactory public record, receive the endorsement of a competent mining expert, based on a personal examination recently made. Such approval, by even more than a single expert, is sometimes required, and that where the mine may have a good history to back it. Under these rigorous requirements it will be seen that the chances for disposing of a worthless or even a decidedly poor mine in the East are slim indeed.

In fact, we do not know but our Eastern neighbors are becoming a little more exacting in this respect than we on the Pacific coast. It is our custom to accept the report of one or two competent authorities on the character of a mining property, whether favorable or otherwise, as conclusive: not so the people or rather the press on the other side. The *Record*, published in New York, quoting an article from the *Fair Play Flume* on the over capitalization of the Little Pittsburg mine, condemns by implication such arrangement as not warranted by the prospective resources of the property, which, nevertheless, stands approved by such men as Rossiter W. Raymond, and other great lights of the profession. So, in like manner, that journal, taking for text something in disparagement of the Carrie Steel mine that appeared in a Silver Reef paper, proceeds to comment unfavorably upon that property, which, besides a good record reaching back through a number of years, was not long since bought on the recommendation of Prof. Clayton and other competent judges who had carefully examined it. It is true, the *Record*, finding that its criticism was uncalled for, hastened to correct the same in its next issue, yet the disposition on the part of these New York papers to guard the interests of their constituency from even the semblance of harm is noticeable. Nor do we complain of this vigilance, since, although not always required, but little evil can come from its over-exercise.

It may, however, be pertinent to remark in this connection that when Eastern investors have availed themselves of the services of such men as Raymond and Clayton, they have done about all they can do to obtain intelligent and reliable information in regard to this class of properties, and they may as well, as is the habit with us, conclude to accept their reports as final, disregarding thereafter all rumors and remarks, *pro* or *con*, whether issuing from the local press or uttered by private individuals. The successful placing of a mine often awakens jealousies which are apt to find expression in ill-natured remarks, or there will be the unrewarded and those who, through failure to reap satisfactory benefits from the transaction, will seek to discredit it. It is said that some of these adventurers now in the East, when they learn of negotiations pending for the sale of a mine, are not above seeking to obstruct the same unless bought off, continuing often to malign the property after it has been disposed of; in view of which buyers should not be surprised if they sometimes hear their purchases illy spoken of.

Touching the Carrie Steel mine, we know it has always enjoyed a good local reputation, and believe that it has been more than self-sustaining from the first, the original owners having from its net earnings defrayed the cost of all developments and improvements made upon it, besides disbursing a considerable amount in dividends. As to its present ore stock, whether extracted or held in reserves, whatever Prof. Clayton has reported the same may be safely accepted as the basis of any business transaction whatever. As a competent and conscientious mining expert he has no superior on the coast. Of the parties in this city who indirectly promoted the sale of this property in New York, we can also say their business standing is of the very best. Of their co-operators in New York we know less, but presume persons interested there have satisfied themselves of their trustworthy character. The principal promoter of the enterprise in New York is a banking house of excellent repute, and we understand that not less than three other institutions of a similar kind have been instrumental in securing the stock of this company for their clients, nearly all the shares disposed of having gone into the hands of rich and influential parties. That these banking houses would not be likely to imperil their good name by accepting the agency of any questionable business may safely be assumed. That they would expose their credit to suffer in consideration of commissions to be paid them is out of the question. If our Eastern friends purpose to engage in the business of mining they must not hope to incur less risk than is involved in cases of the kind here alluded to; nor can investments under such guarantees be considered at all hazardous.

A Half Century of Railroads.

On the 27th of October next, it will be just 50 years since the first locomotive solved the problem of railroad transportation. Unbelievers were many, and one critic, a member of the English committee, inquired of Stephenson, the engineer, whether his machine, running at the rate of nine or twelve miles per hour, would not cause a terrible accident if it should meet an obstacle, a cow for instance. "Yes, to the cow," quietly replied Stephenson. The application of steam to highways was the dawn of a new era in freedom of communication and transportation. Since the introduction of steam as a motor, wonderful improvements have been made, and if it was difficult for contemporaneous witnesses to grasp the immensity of the discovery, it is no less difficult for us now, after 50 years of use, to fully measure all of the direct and indirect consequences that flow from this marvelous means of communication.

George Stephenson declared his discovery to an assemblage of English engineers on the 27th of October, 1829, and on the 17th of September, 1830, the first English railroad was opened between Liverpool and Manchester. Belgium speedily followed the example of England, and in 1837, France inaugurated the Paris and Saint Germain railroad. In 1835, five years after the first railroad, 1,320 miles of road were in operation in the world. At the present time, or at least at the commencement of the year 1878, for our general statistics stop at that year, Europe possessed 94,128 miles of railroad while the United States had about 80,000 miles, and all other parts of the world about 22,000 miles.

These figures are taken from a valuable German work which appeared in the *Gazette d'Augsbourg*. The author states that the capital employed in the building of the railroads of the world amounts to $15,000,000,000, (60 milliards de marks.) An enormous capital for a single industry not yet much older than the average life of man. Here, continues the author, is a fact in political economy never seen since the world began. It has exercised a predominating influence over all human relations, sensible not only in the material domain, but in the intellectual and moral condition of civilized people. Journalism has notably become subject to this influence, since political wants and views, as well as social contiguity change in proportion as we have become cosmopolitan, or have increased our triumphs over the forces of nature in becoming independent of time and space.

Railroads have entirely changed the conditions of productions. They, with steamships, have enabled thinly settled localities of the world, to produce immense crops upon virgin soil, and compete with and triumph over the denser population but worn out soil of older Europe. If 50 years of steam communication have produced such an astonishing result, what may we not expect at the end of a second half-century?

Mining in Trinity County.

From Capt. Geo. H. Atkins, an experienced hydraulic miner and old resident of Trinity county, who called on us a few days since, we learn that the present is likely to prove a very good mining season in that section of country. Although the snowfall on the mountains was lighter last winter than usual, the water supply owing to an absence of any extremely hot spells of weather, has held out this summer better than was expected, most of the companies having still water enough to continue piping. The output of gold for the county will amount this year to a million and a half dollars, very nearly the yearly average of late. As the most of the mines here are held under many small proprietorships and the net profits realized are large, this production meets with wide distribution, almost the entire community participating in its benefits. There is not in the State a people better off, as regards physical comforts, than those of Trinity. If they have few millionaires they have at the same time but little destitution and no pauperism there; and what is a little singular in these latter days the pecuniary condition of the inhabitants is every year improving. This grows out of the fact that nearly everybody, as stated, is interested in the mines, and the additional fact that the mines pay with great steadiness and certainty. In no part of California is the income from this source better assured than in Trinity.

The facilities for carrying on hydraulic operations, the principal branch of mining here, are very superior, being hardly equaled elsewhere on the coast. They may not have as many deep-lying channels in Trinity as in Nevada county, but the gravel, as a general thing, is richer and water more abundant and easily supplied, while in the matter of outlet this section of country is wholly unrivaled, such a thing as trouble from accumulation of tailings never having occurred, as indeed it never can occur except it be in the Weaver Basin or at one or two other points where only operations upon a limited scale are being conducted. All the large mines dump directly into Trinity river or into steep canyons that debouche into that stream, which latter with its powerful current sweeps away everything emptied into it. As yet not a pound of debris has ever made permanent lodgment in the bed of this river. Where a hydraulic claim discharges its tailings directly into the Trinity, a fall of 50 feet is just as good as a fall of 500, as the freshets that annually occur here carry everything clean away. Besides this advantage, the hydraulic deposits in this country are for the most part free from overlying volcanic or other barren matter, a difficulty with which the hydraulic miner further south often has to contend. These favorable conditions of the Trinity gold-bearing gravel banks have begun to attract notice, causing some investments on both California and Eastern account to be made there of late. It is the case, however, that the field for investment is not very extensive in Trinity, and promises soon to be filled in so far as it invites money from abroad. What openings exist here for outside capital are first-class, but they are rather limited. The small claims that can be worked to advantage without the aid of capital are numerous, and will remain in present hands.

Bullion.

The amount of bullion received at San Francisco during the month of May, 1879, from 59 mines was $2,138,793, of which $893,700 was gold, the rest silver. The total amount received from the same mines for the five months ending May 31st, was $11,773,927, an average of $2,354,785.40 per month. Of the total, Nevada must be credited with $8,477,269 from 28 mines; Utah, $638,400 from 4 mines; Arizona, $342,189 from 3 mines, and Dakota, $131,000 from 4 mines; leaving a balance of $2,185,069 to the credit of California, the product of 20 mines. So far as known the bullion receipts for June amounted to $816,589.40 from 29 mines. So far as the State of California is concerned the monthly yield of bullion from the mines all over the State averages $1,700,000 gold and silver. There are numberless small mining claims which go to swell the total amount of bullion, and taking our local receipts and what is shipped through other channels, the annual product will not fall far short of $18,000,000 for the past year for California alone.

The total export of bullion from the port of New York since the 1st of last January amounts to $11,201,094 in gold and silver, silver predominating nearly 9 to 1—an excess over last year's exports of about $3,000,000. The imports are very small in proportion to the total imports for the same time, hardly exceeding the exports of the past week. The figures of the official report of coinage at the San Francisco mint for the year ending June 30th, 1879, are as follows:

Double Eagles	$27,680,000
Eagles	261,000
Half Eagles	834,500
Quarter Eagles	553,700
Total Gold	$29,329,200
Standard Silver Dollars	12,722,000
Grand total	$42,051,200

To make this coinage, the bullion supply was drawn almost exclusively from the Pacific coast mines, and excluding the silver, etc., from Utah, Colorado and Dakota, the most of which finds its way East in bars, as does also considerable of the silver product of Arizona, we can arrive at an estimate of the condition of the Pacific slope mines as bullion producers. Here gold predominates, as will be seen, over two to one. Most of the silver is exported, except what is needed for our own circulation, while the greater part of our gold is retained. The experimental solution of the silver problem in Germany, entailing a loss in the supply of that country amounting to about $25,000,000, has created a desire to increase the amount of silver in circulation. Sales of silver have ceased in Germany, and the deficiency of $25,000,000 must be made up. The astute statesman, Bismarck, was somewhat dismayed and puzzled to account for such an immense loss to the government through recoinage, and has undoubtedly influenced the suspension of sales until the exact amount on hand can be determined. The result of examination can only be a demand for silver which will be felt here in renewed energy to supply the market. China demands considerable silver, in fact out of $867,913, shipped from this port to that country during the month of June last, only $52,666 was gold coin and gold dust, and out of the total exports, viz., $1,193,559, only $126,786 was gold coin. China has a weakness for Mexican dollars, while Honolulu and Central America prefer gold coin and trade dollars.

EASTERN ARIZONA.—Paying placers have, it is reported, been discovered on the Francisco river, not far from Clifton. The Clifton copper mining company are going to have a railroad from their mines to Clifton,

The Mineral District of San Salvador.

[Written for the PRESS by G. K.]

San Salvador possesses many mineral ledges, principally silver and gold veins; also bituminous coal, sulphur, etc., but the most important mineral district is that of San Miguel, of which I send you a sketch. The climate, although warm, is nevertheless healthy, even in the rainy season, at which time the natives are principally the sufferers, having open miserable houses, of one or two rooms, or rather partitions, neither wind nor water-proof, and there is no wonder if a fellow, once sick, dies in consequence of exposure and misery. Sweating is permanent but wholesome. In the mining region it is somewhat cooler. The rainy season commences in the month of May, moderates the heat, and ends in October. The Salvadorians do not seem to take much interest as yet in mining, therefore, in this respect, the country is not developed. They cultivate coffee, indigo, rice, corn, etc., and leave the mining to foreigners. The living is not very cheap, unless one is satisfied with rice. The first-class hotel in La Union charges $1.50 per day; the second, 75 cents; the differences is only in the meals, other accomodations are alike. The import duties are 70% even on flour and wheat, while the neighboring Honduras takes only 30% on flour, and will permit free import of this article from August next.

The people here are good-natured, and there is no necessity of having always a revolver hanging on his side while he is travelling, as is indispensable in Mexico, nor are the foreigners hated here like in Mexico.

Politics are quiet here, except the very diligent drilling of troops from six in the morning to ten, and for two hours more in the evening, Sunday excepted. It looks as if a war was impending. The drilling is going on in La Union, San Miguel, La Libertad, and Salvador, it is said for the reason that the election of the President is approaching, and the present President don't like the short term of his office.

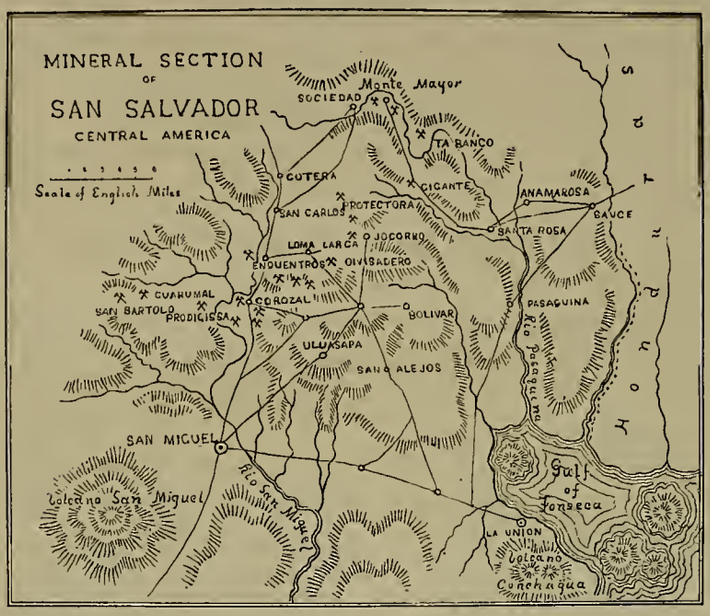
The roads are good in the dry season; machinery can be forwarded on wagons to all mines from La Union. There are many abandoned mines worked to a very limited extent, some of which have been denounced lately; others, like Loma Larga, Tabanco, Enquentros, etc., are in operation for 15 to 25 years. The facilities for working are favorable. Salt costs at the mines $27.50 per ton, wood $2 to $2.50 per cord, and native labor 50 to 75 cents per day. Several mills have water power. The principal pulverizing medium is the arastra. At present there are only two mills using batteries, one is Loma Larga. This mine is owned principally by Gen. Gonzales, residing in Nicaragua. The ore is excellent, contains native silver, silverglance, etc.; very little of base metals, yielding bullion over 900 fine from roasted ore. The mine is worked to a depth of about 150 feet, but considerably in the horizontal extent. There is a great deal of water in the mine, keeping two pumps at work, furnishing more water than ie required for mill purposes. Since the discovery a great deal of silver must have been taken out of this mine, which I could not ascertain, but during 21 months last past $173,000 worth of silver has been extracted, besides $54,300 in exported ore that was shipped to England. This would seem a modsrats production, but it must be taken in consideration that the ten stamps make not more than 50 to 60 drops per minute, with many interruptions, therefore doing no more work than one regular battery of five stamps. Then the improper amount of silver and gold left in the tailings and what goes through the chimney. There are four pans in the mill and two settlers; in these pane the ore was first amalgamated raw, but a better result was obtained after roasting. Although the ore containe gold, preference is given to barrel amalgation, of which there are eight, because the barrels give a better result. The blame is wrongfully given to the pane, instead of to the so-called panman, who knows how to charge and discharge a pan, but not how to amalgamate. The roasting is done in two reverberatory furnaces, one has three hearths with fluee several feet high between, the other has likewise three hearths, but nearly on same level. The roasting itself is not executed systematically, and neither the loss in roasting nor the percentage of chlorination is known, two facts on the proper knowledge of which alone a proper roasting can be based. A Dr. Gaertner tried to improve the manipulation by using sulphate of copper in pans on roasted ore, up to six pounds per charge of one ton. There is another mine, San Pedro, belonging to the same company, not far from Loma Larga, the ore of which is reduced at Loma Larga.

The other mill, having one battery with five stamps, is at Tocorro, a few miles east of Loma Larga. It is a gold-bearing ledge called the Flamingo; was lately denounced by Mr. Miller, and a substantial five-stamp mill with engine, two pans and a settler, procured from San Francisco, and started a few days ago. This concern belongs to Miller & Auerbach.

Tabanco is another important mining place, owned by a French company (credit mobilier). This company has spent a great deal of money in building excellent roads; dam, with a long, very substantial ditch, but only uses water-power, which ceases in the dry season. The pulverizing apparatus is an arastra, driven by a turbine. The pulp is then dried, sifted and roasted with salt in reverberatory furnaces, and finally amalgamated in barrels, after the Freiberg pattern. This company have worked their mines in Tabanco for over 15 years.

Northwest of Tabanco is the reputed Monte Mayor mine, owned by Manning & Co., Liverpool, England. This company purchased Monte Mayor, with four or five other mines, twelve years ago, for $245,000, and these mines are going to change owners now. There is a good water-power here, abundant wood and all facilities for successful working.

Corezal, southwest of Loma Larga, is a valuable mining property, belonging to Mr. Macay. Besides Corozal he owns the mines Barroz, Miguelito, Guarumal, Prodigioso, and Divisiadero. The latter is near Loma Larga, but the ors is transported to Corozal. The Divisadero ore shows native silver and sulphurets and very rich specimens are taken from this mine. The Corozal mine is very wide, but carries a good deal of base metals, principally zincblende, besides copper pyrites, galena and antimony. The mill is very interesting on account of the machinery it contains. At present there is an arastra at work to grind the ore, driven by an engine of 12-horse-power, grinding from four to five tons per day (24 hours). The pulverized ore is discharged on the periphery through screens and deposited in a vat, wherefrom it is taken out, dried, sifted through a rotating cylindrical sieve, 64 meshes to the square inch, roasted in a reverberatory, and amalgamated by the patio process. At least so at present, but



there is a Stetefeldt furnace that cost $6,000, and gave, according to Macay, excellent results, although without a feeding apparatus, so that the ore had to be introduced irregularly. There are also six amalgamating barrels, the amalgamation of which was satisfactory in regard to silver, but only 10% of the gold was obtained. There are also three stamps, two in one battery and one in the other, prepared for wet crushing, a singular English construction, the stems being without tappets, short, and connected with a crank shaft. These three stamps should pulverize about 15 tons in 24 hours, and supply three jiggers of the best pattern made in England, and three eight-feet wide Rittinger percussion tables, also imported from England, all of iron and of excellent workmanship. Having all this machinery and a Stetefeldt furnace Mr. Macay prefers the more simple handling by an arastra and patio amalgamation. Of course a good battery is indispensable to keep the Stetefeldt furnace going and pans, or the lixiviation process likewise. Mr. Macay is willing to make an arrangement with some party profitable for both.

At Enquentros are several ledges, belonging to the same French company which owns Tabanco. The ore of these mines shows very little of base metals, carries native silver and silver sulphurets. At the mill is water-power all the year round. A turbine keeps an arastra in motion, making 15 to 20 revolutions per minute, pulverizing four to five tons per day. Here also the pulp must be dried, pulverized, sifted and roasted with salt before subjected to amalgamation in barrels. These are moved by an iron overshot wheel. The floor below the barrels, which receives the discharge of pulp and quicksilver, is made of tiles, very solid, so that no quicksilver can be lost. The floor is inclined from two sides. At the end of the channel is a round hole, deep enough to receive all quicksilver. The pulp runs over this and two more cavities of same size into a large basin of masonry, from whence it goes into the river without passing an agitator. This property, it is said, can also be bought.

There are in this district many other gold and silver-bearing ledges, worked by individuals, some showing very rich gold quartz specimens, but the beneficiation is somewhat behind time.

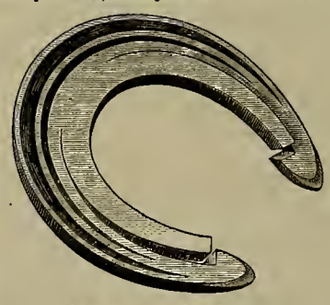
La Union, June 4th, 1879.

A Spring Horse Shoe.

This progressive age suggests another valuable invention in the form of a steel spring horse shoe, that has been thoroughly tested on a number of valuable horses, having various shaped hoofs, in good as well as sore condition, and found to have had a very beneficial effect in every instance. Horse shoeing in general must be regarded as a necessary evil to enable the horse to perform his duty on the artificial, hard, stony roads and streets, and the art of successful horse shoeing consists in surmounting the obstacles nature has thrown in the way. Very little attention has, as a general thing, been paid to the peculiar growth of the hoof. The gradual transformation from the normal to the abnormal form caused through domestication and violation of the laws of nature, such as confinement in stables, lack of moisture in hoofs, owing to the dryness of climate and inattention, as well as wrongly calculated proportions of metal improperly distributed over the foot in the form of shoes, is the main cause of so many hoof evils, which ruin many horses.

The new spring heel shoe, here with illustrated, was recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency, by Mr. H. G. Yates of this city. Such is its peculiar construction that with every step it gives a yielding resistance, and arrests the vibration caused by jarring or pounding on hard roads, this vibration usually having a very destructive effect on the nervous system and muscular action of the animal. The severe concussion following the blow of every step upon the old style of horse shoe is entirely obviated. The new shoe gives an equal bearing around the wall of the hoof. After the yielding resistance of the downward blow, there follows a lifting power, estimated by Mr. Yates at over 200 pounds, at every step of each front foot. The increased weight in the toe of the shoe gives a firm knee action to reach out further, calculated to materially improve the gait of the horse.

This shoe is made by hand of a good tough quality of steel, and by skilled mechanics. It



YATES' HORSE SHOE.

must be put on cold, as it is tempered in oil, and a man without experience could not retemper it with any certainty of success. In ordering these shoes therefore, parties at a distance should send a paper pattern made from an old shoe.

A shoe of this kind is a cheap remedy to apply to horses' feet. The inventor states that by its use he expects to see horses trot a mile in two minutes on a hard track. He informs us that Mr. Soloman, of the Grand Central market, declares that his horse has been benefited $75 in a month by using these shoes. And also that a three-minute horse has gained 28 seconds on spring shoes, with a decidedly improved action, increasing his value some $200. Mr. H. G. Yates, the inventor, may be addressed at No. 263 Clementina street, in this city.

The Iron Mine Case.

The charge of Justice Miller in the case of Stevens & Leiter vs. James Williams, in which the plaintiffs obtained a second victory by the verdict of the jury in their favor, presents indications of the importance of common sense applications to the theoretical distinctions of geologists. The courts have always made it a rule to apply common sense to the law, while admitting expert testimony for information only. The workings of the Iron mine include about 4,500 feet of shafts, drifts and levels. The main incline working-shaft is situated about 300 feet from the south end-line of the Iron claim, and extends in an easterly direction on the dip of the vein, which dips at an angle of 50° from the horizontal. The drifts and levels connecting with this main incline constitute the workings of the mine.

The defendants sank a perpendicular shaft on what they claimed as the Grand View claim, at a distance of some 450 feet east of the mouth of the main incline of the Iron mine to a depth of 200 feet, where they struck the plaintiffs vein on the main incline, on the 28th of September last. They dispossessed the plaintiffs by force, and were in their turn ousted and restrained by an injunction issued out of the United States Circuit Court. The case was tried at the last term of the court, and resulted in a similar verdict. The defendents, however, took advantage of the statute, paid the costs, and by so doing obtained a new trial which resulted again in a verdict for plaintiffs. Justice Miller in charging the jury paid a high tribute to the character of the witnesses who were miners, and treated any differences in their testimony as an error of sight or opinion only.

Attention was called to the meaning of "rock in place," and explained by the court as not meaning hard rock—mere quartz rock, but any combination of rock, broken up, once rock, mixed up with sand and other things, is rock within the meaning of the statute; and that any rocky substance containing mineral matter would also constitute rock in place. It appeared from the evidence that the strike or outcrop of this vein lies longitudinally along the claim of the plaintiffs, and such being the case they have the right to follow the vein on its dip within their projected vertical end lines. The top, apex, or outcrop of a vein is clearly, within the meaning of the statute, the end of the vein which approaches nearest the surface, although the same may be covered by debris or loose rock.

The court refused to charge the jury as instructed by defendants "that if the vein he discontinuous for a considerable distance it constitutes a break in the vein," for two reasons: "First. The words 'considerable distance' may mean nothing, or may mean a mile, half a mile, or, in a case of life or death, even half an inch might be a 'considerable distance.' Secondly. For the reason that in all veins the miner follow their lode through comparatively barren or entirely barren places; but as long as the lode, lead, or contact which the miner follows is distinct, the vein has always been regarded as one continuous vein."

The witnesses on both sides testified that the contact, which in this instance is the lode or lead, is clearly discernible throughout the mine. The plaintiffs asserted that the lime rolls and waves to the west, instead of breaking off, which the defendant denied but only theoretically. He could have easily proved his theory by obtaining an order from the court to make the necessary developments, which they should have done if the amount in controversy was as great as alleged. Section 2329 of the United States Revised Statutes defines the word "placere" clearly and unmistakably, and other deposits consequently come under the only other distinction of the law, namely, that of lodes, leads, or ledges.

The gist of the charge, as will be perceived from the abstract, is:

1. That broken rock, mixed with sand, etc., ie "rock in place," within the meaning of the statute.

2. That the top, apex, or outcrop of a vein is "the end of the vein which approaches nearest to the surface."

3. That barren spaces, breaking the continuity of the paying ore bodies in a vein, do not constitute a break in the vein, if the latter (in this case, the contact) continues uninterrupted; and it would be regarded as uninterrupted although barren places existed.

The opinion of the Court as expressed in the charge goes to the point that a broken condition of rock merely does not fix it as "out of place." The statute plainly intends that the discovery of an *ore deposit*, not of a fraction of such deposit, or of a mass that has drifted away from it, shall decide or carry the privilege acquired by location. While it would in many cases be theoretically difficult to distinguish between veins of rock in place and placers, the court may have intended to make the distinction. The cemented conglomerates of many deep hydraulic claims are as truly rock in place as the sandstones and conglomerates of the carboniferous formations. Courts never hesitate to apply a common sense meaning to abstract and theoretical distinctions, most of which are hardly precise enough as definitions to be made available as criteria. There may be more litigation at Leadville, indeed it is a general rule that in some localities a law suit is a sort of badge of distinction.

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We invite the acquaintance of all parties connected with inventions and patent right business, believing that the mutual conference of legitimate business and professional men is mutual gain. Parties in doubt in regard to their rights as assignees of patents or purchasers of patented articles, can often receive advice of importance to them from a short call at our office.

Remittances of money, made by individual inventors to the Government, sometimes miscarry, and it has repeatedly happened that applicants have not only lost their money, but their inventions also, from this cause and consequent delay. We hold ourselves responsible for all fees entrusted to our agency.

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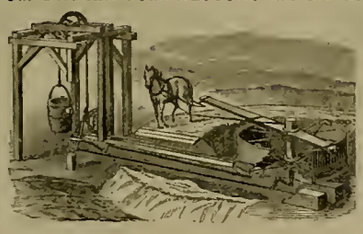

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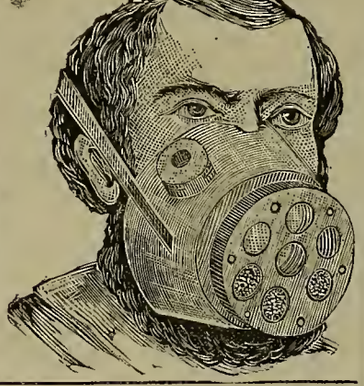

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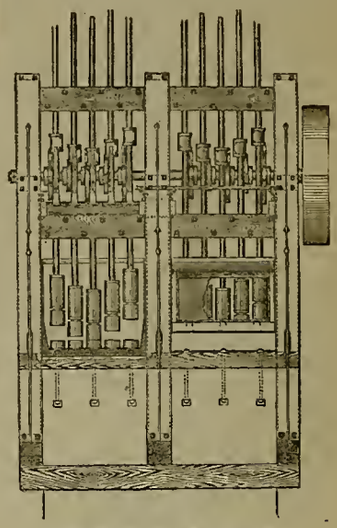

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[CONTINUED FROM PAGE 53.]

whole of last year. The entire section of country wears a promising aspect. A new creek called Proserpine creek has been discovered, with dirt yielding from $4 to $6 to the pan.

COLORADO.

ITEMS.—*Prospector*, July 11: The Powhattan, South Powhattan and Little Annie lodes, about six miles from Silver Cliff, Custer county, have developed good mineral. A true fissure vein showing hard carbonates was discovered on the Powhattan about three weeks since, that st grass-roots assayed from $30 to $51 in silver and gold per ton. A tunnel has been run 65 ft into the mountain, that with 40 ft more of dead work will strike this vein at a depth of 78 ft from the surface and permit the shipping of ore at once. A rich deposit of mineral, at a depth of 25 ft, has been struck, that showed good silver, arsenical iron, galena, gray copper, zinc and other minerals.

IDAHO.

SQUAW CREEK.—*Statesman*, July 17: Mr. G. A. Warner showed us an assay yesterday from some ore which he brought in from Squaw creek, that went $35.20 in gold, and $172.45 in silver to the ton. Warner, Lee Moher, Hank Harvey and Dave Teichner were out on Squaw creek prospecting, and found a very well-defined lode, some four ft wide, which resembles the Bell Peck ore, in Owyhee, though no gold or silver could be seen in the rock, and most of the party pronounced it barren rock. Mr. Warner, however, brought a piece of the rock home with him, and had it assayed by Mr. Wolters, with the result given above, which proves it to be wonderfuly rich in silver. They found several other leads and plenty of float quartz.

MONTANA.

ITEMS.—Butte *Miner*, July 15: Thomas Sarvey pounded out $3 from one pound of rock at William Shield's mine, at the head of Spring gulch, near Summit. The miners at the head of Mill creek are taking out rich ore from the quartz lodes. Another smelter is to be erected at Glendale for reducing ore from the Elm Orlu and other mines in the Burnt Pine district. Prospecting on the river bars in the Big Horn canyon realizes from $1.50 to $6 per day to the hand with a rocker. The ground can only be worked during low water, as the bars are mostly covered during the spring freshets. Butte brick No. 345 was shipped last week from the Alice mine at Walkerville, weight 130 pounds. Total amount of bullion produced by this mine, in one and one-half years, 22½ tons. A new shaft 200 ft east of the old one has been started in the Stevens claim. The main shaft of the Alice has been driven down through the hard syenite to the full depth of 500 ft. The force is now busy deepening the sump, which is to be sunk 20 ft below the 500 station.

NEW MEXICO.

ITEMS.—*Grant County Herald*, July 12: Seven silver bricks, brought in by H. M. Meredith, last Monday, aggregated 966 pounds in weight and nearly $16,000 in value. Something over $1,500 in gold received from Pinos Altos, during the past 10 days. The amount of silver bullion produced by the M. M. & R. W. Co. mill, during May and June, foots up 19,398 ounces avoirdupois—all from Georgetown ore. Since last published statement, I. N. Cohen has received 108,571 pounds of copper from Clinton, and shipped 118,619 pounds to the end of the railroad. Weisl & Lesinsky's shipments of Longfellow copper during the past month, amount to 86,485 pounds. During the same time, they have received 19,340 pounds.

OREGON.

ITEMS.—*Sentinel*, July 16: The miners on Foot's creek have about completed work for the season. All who have been able to uncover bedrock have realized good pay for their labor. This camp is rich and extensive, and though it has been worked for many years there are extensive fields of rich ground on the creek that have never been moved. Wm. Crow reports a nugget just found on Silver creek, as large as a man's hand, and worth over $1,000. Gin Len cleaned up $1,200 after a two weeks' run. Mr. Helms has a specimen of quartz taken from his claim, on Foot's creek, which weighs $600.

ITEMS.—*Times*, July 18: Kretzer & Otten, mining on Farmers' flat, recently picked up a nugget of gold valued at $120, as also other smaller pieces, one of which weighed almost an ounce. Egan & Co. are down 38 ft upon their ledge near Willow Springs, and find the vein four ft in width and still widening. The ore is of an excellent quality. Wm. Nickell, who has returned from Brigg's creek, does not give a flattering account of that section. He says the diggings are deep, hard to work, and not particularly rich in gold. Towne & Reynolds, in the Sterling district, have completed ground sluicing and are now engaged in cleaning up, which will occupy some time. Mr. Reynolds informs us that the spring proved an average one, the results of which have been quite favorable.

WASHINGTON TERRITORY.

COLUMBIA MINING.—Walla Walla *Union*, July 12: There are from 500 to 700 Chinamen mining on the Columbia river at various points from the mouth of the Wenatchie as high up as the mouth of the Spokane river. These Chinamen have been greatly interrupted and annoyed by the Indians for several years past. So great has been the devilment commited by the savages, that many have been driven from their work and out of the country. We have been informed that there were nearly 200 left in one squad, during the troubles, two years ago. Walla Walla has been their supply point in a great measure. We saw one party shipping at one time 15 cases of gum boots, mostly for the use of the Chinese miners on the upper Columbia. They make from $1.50 to $2.50 a day to the hand.

New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's office at San Francisco:

MOUNTAIN TUNNEL GRAVEL M. CO.—Capital, $1,000,000. Directors—H. S. S. McCullough, Charles H. Fish, C. F. McDermott, Everard Stede and Edward Ruhling.

EUREKA G. & S. M. CO.—Capital, $5,000,000. Directors—W. Meeks, John Henderson, J. H. Mayhew and William J. Gray.

FALL RIVER troubles continue; 1,000 rioters attacked a woman and her son who worked without consulting the Union. One woman and a boy won't be allowed to interfere with the rights of the downtrodden workingmen at Fall River.

THERE is some excitement in Beaver county, Utah, over the discovery of placer gold mines on Clear creek, a tributary of the Sevier, about 40 miles from the town of Beaver.

THE *Manufacturer and Builder* says a revolution in practical metallurgy is pending, and that we must prepare for startling changes and developments.

COLORADO editors, who a short time ago stated that Leadville would this year produce $100,000,000, have put their figures down to $11,000,000.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS TO DEWEY & CO.'S MINING AND SCIENTIFIC PRESS PATENT AGENCY.]

By Special Dispatch from Washington. D. C.

FOR THE WEEK ENDING JULY 15TH, 1879.

217,510.—FRUIT DRIER—Wm. Butts, Petaluma, Cal.

217,514.—BAND SAWMILL—S. G. Crawford and B. C. Jackson, Oakland, Cal.

217,518.—QUICKSILVER FURNACE—J. W. Epley, Pope Valley, Cal.

217,474.—MACHINE FOR CRUSHING ROCKS—W. C. Morison, S. F.

217,547.—TOE-WEIGHT FOR HORSE-SHOES—A. J. Packard and C. P. Harris, Hill's Ferry, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

PORTABLE MINING FLUME.—T. Howe and N. Waite, Shasta, Cal. This invention relates to an improved method of constructing mining flumes intended for working new ground, or carrying off tailings; and it consists in the employment of a framework which is so constructed as to support the side-boards of a flume without the necessity of any bottom or the use of the bracing usually employed upon flumes, thus enabling the building of a flume by simply setting it upon ths ground, and when working new ground it will gradually settle down, the earth caving into it and being washed down, until the flume has reached the bedrock; side boards being added as fast as may be necessary. The flume may be built of any width and without the necessity and expense of first excavating to the bedrock, as is now the case. The whole flume is portable and may be easily transported from one place to another by taking out the lagging screw or bolt which is used to unite the parts. The expense is very little increased by making a wide flume over a narrow one, which is one of the most important advantages of this construction.

"HOTEL AND RESTAURANT WAITER."—L. Garrigan, S. F. Dated June 17th. This is a novel device intended to facilitate the delivery of dishes in restaurants and hotel dining-rooms; and it consists of a series of shelves mounted upon a set of wheels, the whole forming a car which is easily moved about. The front wheels are small enough so that they may turn under the lower shelf, thus allowing the car to be turned in a small space. In connection with this car is used a bulletin or card made of any suitable material, on which are placed small checks or cards, each bearing the name of some dish. When an order is given ths waiter puts the cards bearing the dishes ordered upon the bulletin and carries it with other orders to the kitchen, when the order is filled by the cook. The waiter has no trouble in readily delivering it to the right person who ordered, as on the bulletin is placed a series of numbers corresponding with similar numbers on the chairs at the tables, and the cards are placed opposite these numbers. This arrangement will be found very convenient in large dining-rooms, and will avoid annoying mistakes which are common with overburdened waiters.

BUTTON-HOLE MACHINE.—Justin J. Graff, S. F. Dated June 17th. This invention relates to certain improvements in machines for sewing button holes, and is more especially adapted to be used upon a machine previously patented by the same inventor. It consists in so constructing the movable cloth plate and an attached arm together with a supplementary adjustable holding plate, that the button-hole may be finished by hemming it, so that the stitching at the point shall be in line with the hotton-hole instead of across it.

TOE-WEIGHT FOR HORSE SHOES.—A. J. Packard and C. P. Harris, Hill's Ferry, Stanislaus county, Cal. Dated July 15th, 1879. The object of this invention is to produce a toe-weight which will adapt itself to any form of hoof and not necessitate cutting the hoof to secure it. The construction is simple, and the parts are self-binding so that they may be easily attached or removed. Weights of different sizes may be used with the same clamps if desired, thus making a very convenient and practical article.

PROPELLER PUMP.—Geo. Norton, Stockton. Dated May 20th. The peculiar construction of this propeller pump consists in the construction of a single straight cylinder having a shaft extending longitudinally through the center, and provided with propeller blades at intervals along its length. In order to avoid the employment of more than one set of screw propellers, the inventor conceived the idea of employing a longitudinal diaphragm or series of diaphragms which shall prevent any rotation and twisting in the stream.

News in Brief.

THE Nihilists have applied the torch to Nijni Novgorod.

SPAIN will be requested by England to abolish slavery in Cuba.

A FIRE at Merced on the 21st inst. destroyed $15,000 of property.

THE Zulus seem to be desirous of peace, and many have surrendered.

THE utmost alarm prevails at the prospect of a bad harvest in France.

THE attempt to get cheap marble into the new City Hall was a failure.

A NAPOLEON V. and a Henri V. will make it interesting in France shortly.

AFFAIRS in Peru since the death of Harry Meiggs have been topsy-turvy.

SITTING BULL meditates an attack upon the army with 4,000 hostile Indians.

THE entire capital of the Panama Canal Company will be 600,000,000 francs.

A RAILROAD strike is progressing in East St. Louis among the freight handlers.

PRINCE JEROME NAPOLEON has been declared to be the head of the Bonaparte family.

ALL must register by the 9th of August or become like unto Chinamen, without a vote.

ARIZONA points with pride to its climate, it is a way-up climate—up to 120° in the shade.

FRIENDS of the dumb brutes in San Francisco investigated 720 cases of cruelty during the year.

SUFFERING Memphis is again afflicted with the yellow fever. The disease is spreading alarmingly.

THREE men were drowned in S. F. bay last Sunday, while attempting to manage a small, leaky boat.

STUDENTS in the Canadian military college are to be allowed to compete for appointment in the English army.

RUSSIA has made the Caucasus a military basis for Central Asia, and is expelling the mountaineers.

THE Sultan of Turkey is being coerced by England and France to extend the rights of Tewfik, Khedive of Egypt.

THE Porte refuses to allow the United States steamer *Quinnebaug* to enter the Black sea because her tonnage exceeds 800.

THE criminals of Chicago have resolved to emigrate, the Chief of Police having issued an order to run them in on sight.

SERIOUS agitation exists in Westmeath and Mayo against the payments of rents, and intimidation and lawlessness are increasing.

LARGE quantities of fruits and vegetables, particularly potatoes, are being shipped at a profit from San Francisco to Denver, Colorado.

THE Piutes, says the Virginia *Enterprise*, are used as bait for leeches at Pyramid lake. Leeches were never very particular about their diet.

LORD BEACONSFIELD has declared that it is generally unwise to press foreign governments too strongly on the carrying out of treaties; it must be left to moral influence.

A CYCLONE at Tucson, July 17th, struck the office of the *Weekly Star*, completely demolishing the outside of the paper and giving the inside a verticose twist of 180°.

BONNER'S trotter, "Edwin Forrest," made 2:15¼ to wagon on a three-quarter-mile track at Tarrytown the other day; carrying Bonner himself, who weighs 180 pounds.

THE first train crossed the Colorado river and entered Arizona, on the morning of September 30th, 1877, drawn by the Engine 31, John L. Fitzpatrick, engineer.

GEO. H. PENDLETON is said to be scheming for the Presidency in 1884, by killing Thurman or putting in Tilden who will not outlive the term. This is too dreadful to be true.

THE disturbances in the Rumpa district, Madras Presidency, against the tax of palm trees, have assumed the form of an open rebellion. Of four companies of Sepoys sent there, only four men remain faithful.

THE wheat clique in Chicago has sold all of its wheat, clearing four cents a bushel profit on the corner. The same cliques are now running a bull movement in western railroad stocks, with a view to control the coming crop.

THERE is considerable *obiter dicta* in the Chinese queue business, and the opinion seems to obtain credence that if the Pocasset murderer is to be punished, the queue of a Chinaman should be cut off to restore the equilibrium.

INDIA pays annually to England 15,000,000 sovereigns for interest on debt, pensions, salaries and other charges. But she has no sovereigns. The coin she possesses, provided by her government, is in silver rupees. To pay these sovereigns she must buy them in London with her silver rupees. She does this at an annual loss of 3,000,000 sovereigns.

THE century plant, better known in Arizona as *magua* or mescal, is just now decked out in its finest suit. An abundance can be found in the hills surrounding Prescott, and the blossom which only comes once in a century, killing the plant for that period, is no curiosity to Arizonians. The nectar distilled from the above plant has an electrical effect on the human system.

IN MEMORIAM.—We have received an obituary circular announcing that Jacques Antonie Moerenhout, Vice-Consul of France at Los Angeles, died at Los Angeles July 11th, 1879.

THE coinage at the United States mints during the fiscal year, ending June 30th, was as follows: Gold, $40,986,812; silver, $27,227,432.50; minor coins, $97,798; total, $68,312,042.50.

SPECIES OF EUCALYPTUS.—A New Zealand writer sends the London *Journal of Horticulture* some notes on species of eucalyptus which he prefers to the *E. globulus*. He says: "You will find that as your *E. globulus* trees increase in age they will loose much of their present beauty, and assume a very dark green instead of the blue, and cause a good deal of labor in sweeping, as the bark and the leaves are continually falling, and look very untidy where they abound. Some of the other varieties of eucalypti are far more ornamental, in my estimation, than *E. globulus*, some of them having light and graceful foliage, and looking very feathery, more resembling the weeping willow in their habit. They are quick growers, and more hardy than *globulus*. If they were seen and found to suit your climate in England they would become general favorites for ornamental planting."

Back Numbers Wanted.

The following volumes and single copies of the MINING AND SCIENTIFIC PRESS are wanted at this office, for which a reasonable price is offered:

Year.	Volume.	
1870	20	2 Complete volumes, 1st half (of year).
1870	20	2 Copies of No. 2, Jan. 1st.
1870	20	1 Copy each of No. 1, Jan 1st, 3 of Jan 14th, 7 Feb. 11th, 6 Feb. 4th.
1870	21	1 Copy of No. 7, August 13th.
1871	22	5 Copies of No. 1, Jan. 7th.
1871	22	3 Copies of No. 5, Feb. 4th.
1871	22	1 Copy of No. 3, Jan. 21st, 6 of Feb. 2d, and 1 of May 1st.
1871	23	1 Copy of No. 2, July 15th, and 9 Sept. 2d.
1872	24	2 Copies of No. 4, Jan. 27th.
1872	24	3 Copies of No. 7, Feb. 17th.
1872	24	3 Copies of No. 17, April 27th.
1872	25	2 Complete volumes, last half (of year).
1873	26	4 Copies of No. 8, Feb. 22d.
1873	26	3 Copies of No. 9, March 1st.
1873	26	4 Copies of No. 10, March 8th.
1873	26	2 Copies of No. 7, Feb. 15th.
1873	26	1 Copy of No. 0, Feb. 8th.
1873	27	4 Copies of No. 20, Nov. 15th.
1873	27	5 Copies of No. 21, Nov. 22d.
1873	27	4 Copies of No. 24, Dec. 13th.
1875	30	2 Copies of No. 4, Jan. 23rd.
1875	30	2 Copies of No. 5, Jan. 30th.
1875	30	1 Copy of No. 6, Feb. 6th.
1875	30	2 Copies of No. 8, Feb. 20th.

EVERY new subscriber who does not receive the paper, and every old subscriber not credited on the label, within two weeks after paying for this paper, should write personally to the publishers without delay, to secure proper credit. This is necessary to protect ourselves and subscribers against the acts and mistakes of others.

Quicksilver Mining Publication.

Memoir on the Mines and Works of Almaden, by M. H Kuss, M. E. Translated from the "Annales des Mines" for the MINING AND SCIENTIFIC PRESS, by S. B. CHRISTY.

CONTENTS.—PART I.—Geological Description of the Deposits at Almaden: 1. Introduction; 2. Geological Situation and Constitution; Silurian System; Devonian System; Eruptive Rocks; 3. Deposits of Mercury; Description of the Mine; Mineralogical Constitution of the Vein Matter; Age of the Veins; Abandoned Mines. PART II.—Exploitation of the Mines of Almaden: 1. Method of Exploitation; 2. Organization of Labor; 3. Mechanical Preparation. PART III.—Metallurgy of Mercury at Almaden: 1. Description of the Works; 2. Treatment of the Ore; 3. Losses of Treatment. PART IV.—Administration and History; 2. History; 48 large pamphlet pages, post-paid, 50 cents. DEWEY & CO., Publishers, S. F., 1879.

SOUTH PACIFIC COAST RAILROAD.—This popular line has made a reduction in rates between San Francisco and San Jose and Santa Clara, to take effect April 1st, 1879, viz: Regular local tickets between San Francisco and San Jose, $1.75; Santa Clara, $1.65. Round trip tickets (good until used) between San Francisco and San Jose, $3.25; Santa Clara, $3.05. Excursion tickets sold Saturday afternoons and Sunday mornings from San Francisco and Park street, Alameda, to Santa Clara or San Jose and return, $2.50; good only until Monday evening following date of purchase. Commutation tickets good for one round trip daily during calendar month, between San Francisco and San Jose, $20; Santa Clara, $19. Family tickets for 10 rides and 30 rides, also six months and yearly commutation tickets on sale at corresponding reduction in rates.

GEO. H. WAGGONER, Gen'l Pass. Agent.
THOS. CARTER, Superintendent.

FRESH attractions are constantly added to **Woodward's Gardens**, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

SETTLERS and others wishing good farming lands for sure crops, are referred to Mr. Edward Frisbie, of Anderson, Shasta County, Cal., who has some 15,000 acres for sale in the Upper Sacramento valley. His advertisement appears from time to time in this paper.

REDDING, July 12th, 1879.

MESSRS. DEWEY & CO.—*Gentlemen:*—Have received my letters patent for the bar roller to-day. I am very much obliged to you for your prompt service, and will recommend you to all who may want your assistance.

I remain yours, etc., GEO. MEDING.

HOW TO STOP THIS PAPER.—It is not a herculean task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

EXTRA COPIES can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

PRINTER'S PROOF PRESS, complete and in good working order, for sale at this office, at the low price of $30. Call and see it.

EXPERIMENTAL MACHINERY, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. See ad. F. W. FULLER, 415 Market St., second floor, S. F.

Chew JACKSON'S BEST Sweet Navy Tobacco

GENERAL MERCHANDISE.

[WHOLESALE.]

WEDNESDAY M., July 23, 1879.

CANDLES.

Crystal Wax	17 @—
Eagle	12 @—
Sperm	30@—

CANNED GOODS.

Assorted Pie Fruits, 2½ lb cans	7 25 @ —
Table do	3 50 @ —
Jams and Jellies	3 75 @ —
Pickles, hf gal	3 25 @ —
Sardines, qr box	1 67½@1 90
Hf Boxes	2 50 @2 75
Merry, Faull & Co's. Preserved Beef, 2 lb. doz	3 75 @4 00
do Beef, 4 lb. doz	5 50 @ —
Preserved Mutton, 2 lb. doz	3 75 @ —
Beef Tongue	5 50 @ —
Preserved Ham, 2 lb. doz	5 50 @ —
Deviled Ham, 1 lb. doz	5 50 @ —
do Ham, ½lb doz	3 00 @ —
Boneless Pigs Feet, 3 lbs	4 50 @ —
2 lbs	3 75 @ —
Spiced Fillets, 2 lbs	4 25 @ —
Head Cheese, 3 lbs	4 25 @ —

COAL—Jobbing.

Australian, ton	6 00 @ 6 50
Coos Bay	— @ 5 50
Bellingham Bay	— @— —
Seattle	5 50 @ 5 00
Cumberland	12 00 @15 00
Mt Diablo	4 75 @ 6 00
Lehigh	11 50 @12 50
Liverpool	8 00 @ 6 50
West Hartley	— @ 8 00
Scotch	— @ 8 00
Scranton	— @— —
Vancouver Id	6 00 @— —
Charcoal, sack	75 @— —
Coke, bush	60 @— —

COFFEE.

Sandwich Id, lb	— @— —
Costa Rica	16 @ 16½
Guatemala	15 @ 16½
Java	25 @— 26
Manila	17 @— —
Ground, in cs	25 @— —

FISH.

Sac'to Dry Cod	— @ 4
do In cases	5 @ 6
Eastern Cod	7 @— 7½
Salmon, bbls	8 00 @ 9 00
Hf bbls	5 00 @ 5 50
1 lb cans	1 10 @ 1 12½
Pkld Cod, bbls	22 00 @— —
Hf bbls	11 00 @— —
Mackerel, No. 1	
Hf Bbls	9 50 @10 00
In Kits	1 85 @ 2 10
Ex Mess	3 25 @— —
Pkld Herring, bx	3 00 @ 3 50
Boston Smkd Hg	70 @— —

LIME, Etc.

Plaster, Golden Gate Mills	3 00 @ 3 25
Land Plaster, tn	10 00 @12 50
Lime, Sta Cruz, bbl	1 25 @ 1 50
Cement, Rosendale	2 00 @ 2 25
Portland	4 00 @ 4 50

NAILS.

Ass'ted sizes, keg	2 70 @ 2 75

OILS.

Pacific Glue Co's Neatsfoot, No 1	1 00 @ 90
Castor, No 1	1 35 @ —
do, No. 2	1 30 @ —
Baker's A A	1 25 @1 30
Olive, Plagniol	5 25 @5 75
Possel	4 75 @5 25
Palm, lb	9 @ —
Linseed, Raw, bbl	78 @ —
Boiled	80 @ —
Cocoanut	65 @ —
China nut, cs	— @ 65
Sperm	1 40 @ —
Coast Whales	— @ 32½
Polar	— @ 35
Lard	— @ 70
Oleophine	22 @ 22
Devoe's Brl't	17½@ 18½
Photolite	— @ —
Noonan'el	31 @ 32½
Eureka	18 @ 42½
Barrel kerosene	20 @ —
Downer Ker	35 @ —
Elaine	37½@ —

PAINTS.

Pure White Lead	8 @ 8½
Whiting	1½@ —
Putty	4 @ 5
Chalk	1½@ —
Paris White	2½@ —
Ochre	3½@ —
Venetian Red	3½@ —
Averill Mixed Paint, gal. White & tints	2 00 @2 40
Green, Blue & Ch Yellow	3 00 @3 50
Light Red	3 00 @3 50
Metallic Roof	1 30 @1 50

RICE.

China, Mixed, lb	4½@ 5
Hawaiian	6 @ —

SALT.

Cal. Bay, ton	15 00 @22 50
Common	10 00 @12 00
Carmen Id	12 00 @14 00
Liverpool fine	19 00 @— —

SOAP.

Castile, lb	8 @ 15
Common brands	4½@ 6
Fancy brands	7 @ 8

SPICES.

Cloves, lb	— @ 45
Cassia	19 @ 20
Nutmegs	85 @ 87½
Pepper Grain	— @ 12
Pimento	19 @ 20
Mustard, Cal., ½ lb glass	— @1 25

SUGAR, ETC.

Cal. Cube, lb	— @ 10½
Powdered	— @ 10½
Fine crushed	— @ 10½
Granulated	— @ 10
Golden C	— @ 8½
Cal. Syrup, kgs	70 @ —
Hawaiian Mol'sses	26 @ 30

TEA.

Young Hyson, Moyune, etc	— @ 50
Country pckd Gunpowder & Imperial	— @ 42½
Hyson	30 @ 35
Fooo-Chow O	35 @ —
Japan, 1st quality	40 @ —
2d quality	20 @ 25

METALS.

[WHOLESALE.

WEDNESDAY M., July 23, 1879.

IRON.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2¾@ 3½
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 7
Norway, according to thickness	6½@ 7
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @
TIN PLATES.—	
10x14 I O Charcoal	8½@ 9
10x14 I O Coke	7 @ 7½
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Oask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb, less than cask	9½@— 10
NAILS.—	
Assorted sizes	2 90@3 00

LUMBER.

WEDNESDAY M., July 23, 1879.

CARGO PRICES OF REDWOOD.

Rough, M	13 00
Refuse	9 00
Clear	23 00
Clear Refuse	13 00
Rustic	23 50
Refuse	18 00
Surfaced	20 00
Refuse	14 00
Flooring	20 00
Refuse	12 00
Beaded Flooring	23 00
Refuse	13 00
Half-inch Siding	16 00
Refuse	14 00
Half-inch Surfaced	20 00
Refuse	14 00
Half-inch Battens	16 00
Pickets, Rough	11 00
Rough, Pointed	12 50
Fancy, Pointed	18 00
Shingles	1 75

PUGET SOUND PINE

RETAIL PRICE.

Rough, M	18 00
Fencing	18 00
Flooring and Stop	28 00
Narrow	30 00
2d quality	25 00
Laths	3 50
Furring, lineal ft	

REDWOOD.

RETAIL PRICE.

Rough, M	18 00
Refuse	14 00
Pickets, Rough	15 00
Pointed	16 00
Fancy	22 50
Siding	20 50
Surfaced & Long Beaded	30 00
Flooring	30 00
Refuse	22 50
Half-inch Surfaced	30 00
Rustic, No. 1	30 00
Hatteus, lineal ft	
Shingles M	2 00

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending July 22, 1879.

	July 16	July 17	July 18	July 19	July 20	July 21	July 22
HIGHEST AND LOWEST BAROMETER.							
	29.973	29.945	29.960	29.950	29.950	29.953	29.969
	29.909	29.898	29.923	29.909	29.925	29.933	29.897
MAXIMUM AND MINIMUM THERMOMETER.							
	63	67	62.5	61.5	64	63	67.5
	53.5	54	54	53	52	53	54
MEAN DAILY HUMIDITY.							
	62.3	66.3	73	81.7	75.7	80	78
PREVAILING WIND.							
	W	W	W	W	W	W	W
WIND—MILES TRAVELED.							
	264	277	363	318	471	392	299
STATE OF WEATHER.							
	Clear.	Clear.	Fair.	Fair.	Clear.	Clear.	Fair.
RAINFALL IN TWENTY-FOUR HOURS.							

Total rain during the season, from July 1, 1878, 0.01 in

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, July 23, 3 P. M.

SILVER 37½@12½. GOLD BARS, 8A@910. SILVER BARS, 8@19 ⅌ cent. discount.

EXCHANGE ON New York, 20, on London bankers, 49½@ 49¾ Commercial, 50; Paris, five francs ⅌ dollar; Mexican dollars, 90½@92½.

LONDON CONSOLS, 97 15-16; Bonds (4%), 105¼.

QUICKSILVER in S. F., by the flask, ⅌ lb. 33½c.

The Mechanics' Fair Daily.

By authority of the BOARD OF MANAGERS OF THE MECHANICS' INSTITUTE FAIR the publishers of the MINING AND SCIENTIFIC PRESS will issue a large editiou of the TENTH VOLUME of the MECHANICS' FAIR DAILY during the FOURTEENTH INDUSTRIAL EXHIBITION, which opens in San Francisco, Tuesday, August 5th, 1879.

It will bo of handy size, printed and circulated FREE in the Pavilion, and contain the day and evening programme, a list of exhibits, and official bulletin of the Iustitute.

Its columns will embrace a large variety of important industrial and scientific information, illustrations and well written descriptions of the general features and most deserving and novel exhibits in the Fair, a record of the Fair and incidents of its daily progress—gay, serious and comic—as they occur.

The best of editorial, reportorial and corresponding talent will be employed, with a view to make the paper of live interest in all its departments and of standard value as a full record of the great exhibition, the wonderful inventions, rich resources and rapid progress of our great Western community.

More than ONE HUNDRED THOUSAND different individuals will read copies of our paper during the Fair. The novel character of the journal—the specially attractive features of its free issue in the Pavilion, and its absorbing interest to visitors at the Fair, the attention its columns command when brought into the shop and family circle by those who receive it gratuitous at the Fair, make the paper a powerful advertising medium.

The Managers have granted us the exclusive advertising and printing privileges of the exhibition.

Our nine previous volumes have met with unrivaled success and gratifying results to advertisers, nearly all of whom were leading and first-class business firms.

Many thousands of marked copies were sent by mail and otherwise to friends near and distant, giving the FAIR DAILY a more broadcast and universal circulation than any other newspaper published.

Its columns are more closely examined throughout than those of any ordinary publication.

By past experience, ample facilities, and a fair reputation of doing business in our line, we expect, with the reasonable support of all naturally interested in the success of our enterprise, to make the coming volume superior to its predecessors, and eminently satisfactory to the Institute, to our patrons and to the general public, who are more or less benefited by such an advocate of the substantial advancement of the grand and worthy industries of our Coast.

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Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Numa Mining Company.—Location of Works, Humboldt County, Nevada.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 1) levied on the 13th day of June, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. of Cert.	No. Shares	Amount
Blasdel, E W, Trustee	27	500	$ 15 00
Blasdel, E W, Trustee	28	500	15 00
Blasdel, E W, Trustee	31	500	15 00
Blasdel, E W, Trustee	47	500	15 00
Blasdel, E W, Trustee	48	107	balance 5 00
Brown, George A	42	500	15 00
McKusick, H J	44	4000	120 00
Pierson, Wm M, Trustee	53	2500	balance 75 00

And in accordance with law, and an order of the Board of Trustees, made on the 13th day of June, 1879, so many shares of each parcel of said stock as may be necessary will be sold at public auction at the office of the Company, 328 Montgomery street, room 21, San Francisco, Cal., on the 11th day of August, 1879, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale. DAVID WILDER, Secretary.

Office, 328 Montgomery Street, room 21, San Francisco, California.

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BARTON HILL.....Acting Manager.

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J. P. CHAPMAN.....Assistant Treasurer.

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EDWARD EVANS.....Manager.

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Having complete arrangements with competent and reliable parties in Washington City, by which we are able to secure prompt and careful attention to law business there, we are prepared to assist Mill and Mine, Canal and Ditch owners in securing patents for their lands, mines and claims, in addition to our general line of patent business.

Many who are acquainted with the manner in which this business has heretofore been conducted, (with or without assistance by local attorneys), will see at once the great advantage of patronizing an establishment that is thoroughly organized and has its representatives in Washington to look after and prosecute their applications before the Commissioner of the General Land Office. The business on this Coast will be attended to personally by a member of our firm, and satisfaction will be given in all respects.

Correspondence from persons desirous of securing patents for Lands, Mines, Mill Sites, Canal and Ditch property, promptly attended to.

Applicants for patents for mining and farming land, whose claims have been delayed for any reason, will find it to their advantage to consult with us and in case of necessity secure the services of our home and Washington branch agency.

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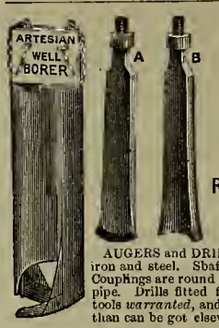

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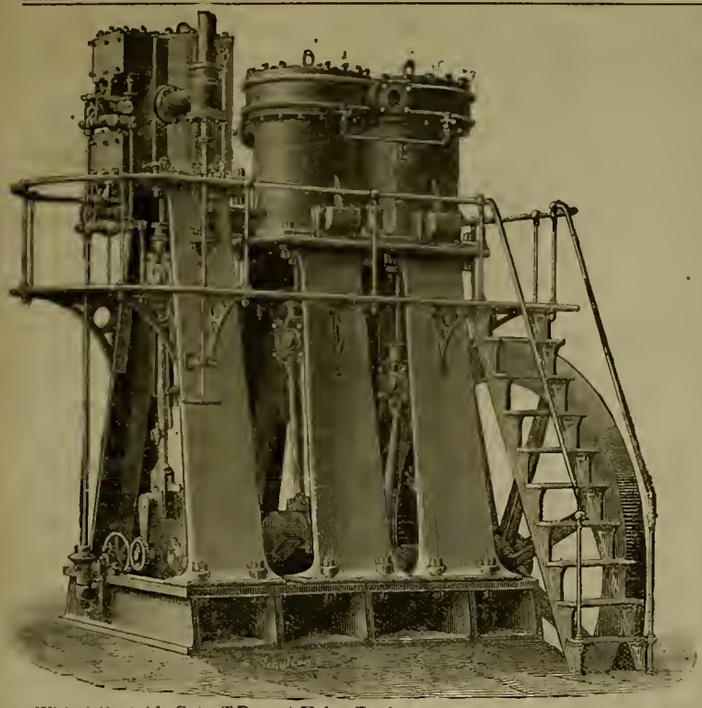

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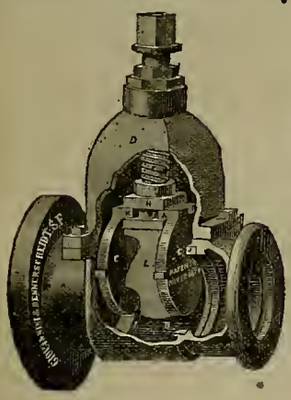

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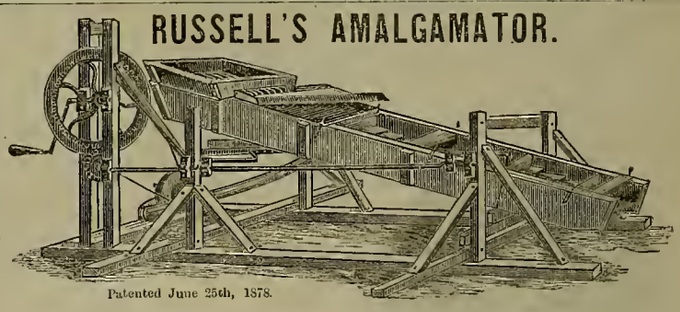
RUSSELL'S AMALGAMATOR.



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The entire Lining, Hanging Plates, Riffles and Boxes Amalgamated

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Iron Cut, Punched, and Formed for making Pipe on ground, where required. All kinds of Tools supplied for making Pipes. Estimates given when required. Are prepared for coating all size of Pipes with a composition of Coal Tar and Asphaltum.

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SILVER PLATED AMALGAMATING PLATES.

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Iron, Steel and Galvanized Wire

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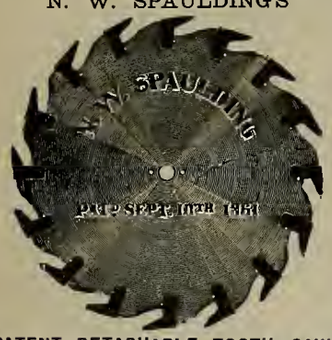

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It breaks more ground, pulverizes it better, saves time and money, and is superseding the ordinary powder wherever it is tried. Triple Force Caps and all Grades of Fuse.

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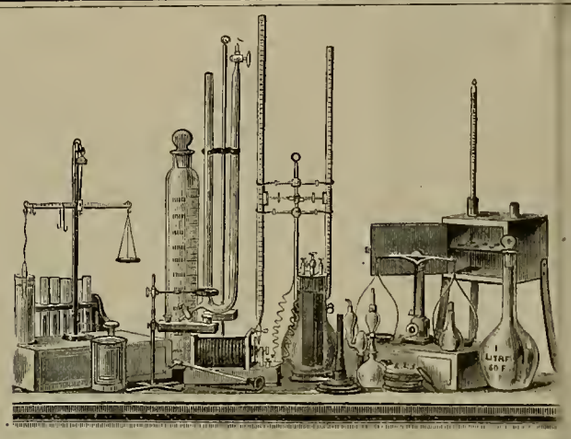

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The Strongest, Safest, Most Uniform and Reliable "HIGH EXPLOSIVE" Manufactured on the Coast

MINERS TESTIFY THAT IT IS FREE FROM OBJECTIONABLE FUMES.

We call the attention of all desiring such a Powder to our various grades, which we are prepared to sell at LOWEST RATES.

No. 1.—Equalling Liquid Nitro-Glycerine in Strength. We recommend this Grade in extremely hard rock, boulders, iron, etc.

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No. 3.—For bench work, pipe-clay, soft and shelly rock, outside work and quarrying.

Single and Triple Force Caps, Fuse of all Grade Vulcan Powder Thawing Boxes, Batteries and Exploders, For Sale at the Lowest Rates.

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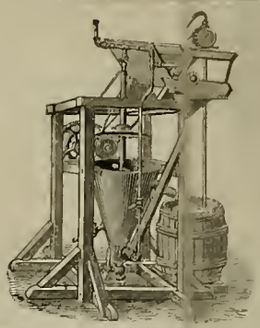
Is the Best, Simplest and Cheapest Amalgamator in Use.

Nothing about it to get out of order or wear out. Weighs only 500 lbs—heaviest piece weighs 160 lbs. Is automatic in its working. Measures, feeds, screens and passes all material through a large body of quicksilver; then washes and cleans without care or attention. Requires no more power than a large grindstone. Uses water over and over again where water is scarce. All water required can pass through a 3-inch pipe. Capacity, two to four tons per hour. Saves 90% of precious metals. Price, $250. Pump $25 extra. Send for circular.



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DIVIDEND NOTICE.

The German Savings and Loan Society.

For the half year ending this date, the Board of Directors of the GERMAN SAVINGS AND LOAN SOCIETY has declared a Dividend on Term Deposits at the rate of seven and one-fifth (7 1-5) per cent. per annum, and on Ordinary Deposits at the rate of six (6) per cent. per annum, free from Federal Taxes, and payable on and after the 15th day of July, 1870. By order.

GEO. LETTE, Secretary.

San Francisco, June 30th, 1870.

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AS FOLLOWS:

LEAVE SAN FRANCISCO—Monday, Wednesday and Friday at 4 P. M. for Stockton; leave Stockton at 8 A. M. on Tuesday, Thursday and Saturday, connecting with stage at MILTON at 9:30 A. M., arriving at BODIE at 4 P. M. next day.

LEAVE BODIE Sunday, Tuesday and Thursday at 6 A. M. and connecting with train at MILTON at 10:40 A. M. next day, arriving in SAN FRANCISCO at 5:15 P. M.

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CAUTION!

To Section Chimney Builders.

All chimneys on which joint bands with cement, or its equivalent, are used to make the joint smoke and fire-proof, with rods, clamps, or their substitutes, to brace the chimneys to the buildings, are INFRINGEMENTS on my patents. My patents for sectional chimneys have been sustained in every instance.

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400 ft PROFESSIONAL FILM 36 EXPOSURES TMY 135-3

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. | SAN FRANCISCO, SATURDAY, AUGUST 2, 1879. | VOLUME XXXIX Number 5.

An Ingenious Automatic Ventilator.

We illustrate herewith an ingeniously devise and curious automatic ventilator, recently pa ented through the MINING AND SCIENTIF PRESS Patent Agency by Frank J. Crouch, Eugene City, Oregon. Mr. Crouch is a you man of great ingenuity, and has invented number of useful appliances of different kin This ventilator is his latest device. It is i tended as an attachment to windows, transon, etc., by means of which the opening or clo ing of the window or transom is automatica accomplished, in accordance with the tempe ture of the room.

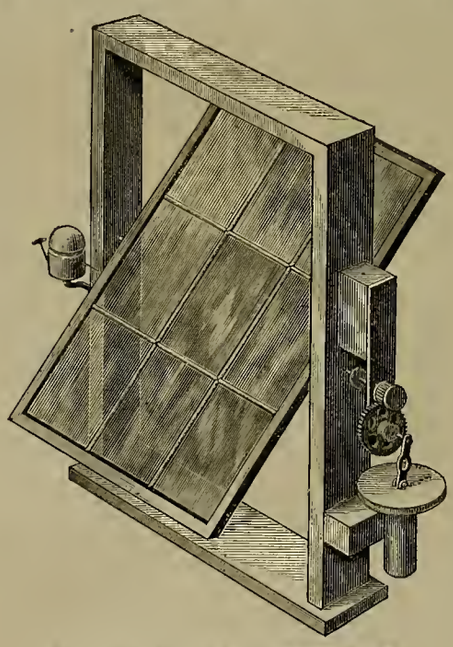
The sash or transom is hinged or swiveled the frame, so as to swing in a circle on a cent l axis, and thus be opened or closed. This sh t or axis is continued through the window fra e on one side. On its outer end is a pinion, wh n nnites with a small spur wheel, as shown.

On the lower part of the frame is secured a pipe-cylinder or chamber, on top of which i a thin metallic plate. On top of this plate is a other of the same size and shape, the two pla s being secured together at their edges, and e space between them being filled with sulphu c ether, turpentine, alcohol or similar sensit e substance. The tube or cylinder opens into e chamber formed by these two plates throu h the lower plate, and also contains the ether r other substance. To the top plate of the ck is secured an arm, the upper end of which is fastened to a crank on the spur wheel.

Now, when the liquid in the cylinder ad between the plates or disks expands, the pla s are expanded as they admit of a sensible spr g apart at the centers. As they are expanded or forced apart by the expanding substance, e arm attached to the upper plate operates e crank and gear wheel, thus rotating the pin n on the shaft or trunnion carrying the sash or transom, and the sash or transom is thus sw g open. As the liquid cools, th reverse is e case, and the sash is closed.

The plates and cylinders are made prefer y of glass, as it absorbs heat readily, and non of the chemicals used will corrode it. No dan r-ous effects are produced should leakage occ r.

The plate and cylinder are placed inside e the room so as to be affected only by the t perature inside. When the room is heated e resultant expansion of the plates acting on e gearing will open the transom, and as the li id cools, the plates come together, and close e transom, thus regulating the size of the open g through the transom or window in proporti to the temperature of the air. This durable d self-acting ventilator is adapted to hotels, e aters, halls and private dwellings, where g d ventilation is desirable. On one side of he window frame may be attached a gong, sc r-ranged that in case of fire or when there is y unusual heat, the movement of the sash ill ring the bell to attract attention.



CROUCH'S AUTOMATIC VENTILATOR

EBONIZING WOOD.—W. E. D. desire to know "the details of making the so-c ed ebonized wood for furniture and cabinet w k. What kinds of woods can be used and how he finish is put on." 1. The wood may be ed black by copperas and nutgalls, or by japan g with two coats of black japan, after which r-nish or polish, or use size and lamphlack, p vious to laying on japan. 2. Collect lamp k from a lamp or candle on a piece of slate, an ordinary China dinner plate. Scrape of he deposit, mix with French polish and app to the object in the ordinary way. Any kin of wood can be used.

DEPARTURE.—We notice the departu of Mr. Henry Woodcroft Hammond from Vir nia City for England. Mr. Hammond has for n y years had large transactione in the wire ope business, both with San Francisco and ew York, and has been visiting his agencies o his coast, and as we understand, taking large c ers from here. He is a nephew of the late of. Bennett Woodcroft, who was for 25 ye at the head of the British Patent Office in Lo n.

Quicksilver Production of California.

It is a sorrowful but acknowledged fact that when an important enterprise of any kind is inaugurated and begins to establish itself upon a paying basis, the bright anticipations of the originators are sat down upon by the ubiquitous tax collector. There is neither rhyme nor reason in any indirect crushing or smothering of any business to satisfy the ever increasing and never ending demands of taxes. The goose that lays the golden egg is killed to satisfy the rapacity of tax requirements. It seems sometimes that we need more tea thrown overbeard by caricature Indians in order to stop the inequality of our burdens. Our remarks are, to a certain extent, applicable to the assessments npen the quicksilver production of California.

Five counties in this State contain quicksilver mines, and, with their production for the past three years, are as follows: Napa county, Redington mine, 25,494 flasks, assessed value per flask $15.89; Lake county, Sulphur Banks, 30,849 flasks, assessed value per flask $10.08; Lake county, Great Western, 14,266 flasks, assessed value each $9.84; Sonoma county, Oakland, 4,687 flasks, assessed value per flask $7.11; Fresno county, New Idria, 17,846 flasks, assessed value per flask $10.74; Santa Clara county, Guadalupe, 18,952 flasks, assessed value per flask $13.36; Santa Clara county, New Almaden, 56,488 flasks, assessed value per flask $17.66.

It would not be true to say that the stoppage of work on some of these mines is due wholly to the tax upon an enhanced valuation. But it is one of the reasons. Quicksilver has commercial value capable of being definitely ascertained, yet, in the valuation put upon the flasks, there are differences amounting to $10.55. New Almaden having an assessed value per flask of $10.55 more than the Oakland of Sonoma county.

The New Almaden has its entire property assessed upon a valuation of $997,645, while all the other mines combined are valued at only $1,334,894; and besides assessed per flask at $17.66. The total production of all of the quicksilver mines amounts, for the last three years, to 168,582 flasks. A large industry, and one productive of considerable income to the State. Mining property should bear its just proportion of taxes; but there is no property in the world so difficult to assess correctly. An immense capital may be sunk in mining property, and yet would be valued at a high figure, too high to be compatible with justice perhaps, and, in the case of our quicksilver mines, very far from the constitutional spirit of equal taxation. Our quicksilver mines deserve to be fostered, since their past has proved to be of so much importance to our general mining interests.

Footprints of Inventors.

If we could drop out of mind the mechanical world of the present and have the world of 100 years ago revealed to us, a vast and comparatively trackless plain would represent the industrial condition of the time. The only footprints visible are the shadowy ones of the geniuses of the day, searching for the connecting link between mind and matter. Coping with the material difficulties and laying aside all personal considerations, these footprints in the sand become more distinct as time approaches the present, until they become the footholds of progress, the beaten track which has led modern inventors to the apotheosis of mechanical ingenuity. The world would have existed without the inventor, a weakly, sickly world, Hamlet, with the part of Hamlet omitted. The elements of nature held in abeyance, awaiting the inventor's wand, would have rusted in oblivion, if poverty, toil and persecution had driven the inventive genius of man from the field. The element of light latent in a multitude of substances came forth obedient to the command of an inventor, and found a foothold towards progress in the lucifer match. The means of creating light called forth the inventor who could find a use for the application of that element, and illuminating facilities have developed into the brilliancy of the sun through the medium of that fearful power, electricity. And this is only a small portion of the inventive progress of man. Through all of the various gradations of progress, from the faint footsteps of the early inventor to the steady, heavy tread of the modern inventor, each one has established a foothold for the progressive discoveries of him who came next in the order of time, until it would seem as if perfection had been attained, but still the dim outline of future possibilities point the inventor incessantly to renewed exertions in solving the mysteries of the elements and in gratifying the never-ending demands of progressive humanity.

Mineral Exhibit at the Mechanics' Fair.

That the mineral products of this coast should be as fully represented as possible at the approaching exposition of the Mechanics' Institute is a proposition too obviously true to require argument. Of all our material products none more deserve to find a place in a grand display of this kind than these, none others being so generally interesting or thoroughly typical of our natural resources. What is being done officially to meet this necessity we are not fully advised. Dr. J. I. Bleasdale, who has for some time past been engaged in making a collection of minerals on this coast, will, we understand, place the same on exhibition at the Fair. This gentleman's collection, which is quite large and considerably varied, contains some specimens unique and rare, and will, so far as it goes, constitute an attractive feature in this line. This is a matter, however, that should not be left solely to private hands to be looked after, but should receive attention from the management itself.

There is in this city the material for making a creditable display in this department if only proper measures are taken for obtaining and preparing it for the use of the Institute. The Geological Society of this State has been working quietly for several years gathering ores, fossils and metals of every description. They have now on hand an immense quantity of these mineral treasures, boxed up and stored in a fire-proof building for safety. For the purpose designated the entire fruit of their labors would be placed at the disposal of the Institute, the Society being assured, of course, that they would be properly cared for and safely returned. These specimens to fit them for exhibition would require to be labeled and placed in cases, a work that could be safely committed to none but professional hands. To command the services of a proper person for this duty a suitable compensation would have to be paid; and here is where we suspect a trouble would come in, defeating the end here suggested. The management of these and similar expositions have been in the habit of getting this sort of service performed gratuitously, and looking for its continuance may be therein disappointed, for the self-sacrificing spirit of even the most enterprising becomes after a time exhausted. But this should not suffice to keep this valuable collection shut out from the public eye. Its presence would no doubt increase the receipts of the Institute beyond the cost of securing it.

In addition to this collection of the State Geological Society, or, in its absence, the splendid collection of Henry G. Hanks, might at a small outlay be secured for the uses of the Fair. This collection is very valuable and extensive, having been selected with care, and filling 40 large show cases. The Institute could hardly do less than procure this, engaging the owner to look after it while being displayed, and also give his attention, if need be, to other minerals on exhibition.

In our minerals repose the sources of our peculiar wealth, and to have them omitted or inadequately represented in a display of this kind, would evince a want of appreciation of their importance as well as a lack of State pride. We require these mineral products to be presented for inspection on these public occasions not so much as curiosities as for their economic and commercial values. Many of them are becoming important in our manufactures and useful arts and should therefore be studied and made widely known. In a large and utilitarian sense iron may be more valuable than gold, and a paving-stone of more importance than a diamond.

BIDS for supplying the U. S. mints with silver bullion were opened on the 24th inst., 600,000 ounces were offered. San Francisco bids were declined, being in excess of market rates. The largest proportion of silver coinage during the month of August will be done at the Philadelphia mint, owing to the inability to procure silver at market rates for the Western mints.

AN international exhibition of fishes and fisheries is contemplated at Berlin next year. The Pacific coast fishes should be represented.

A. S. HALLIDIE.

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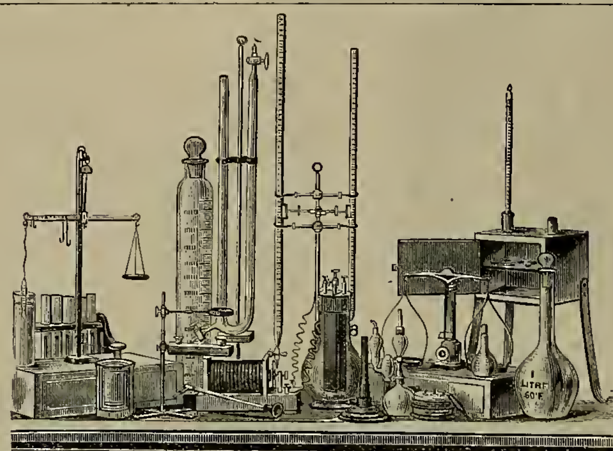

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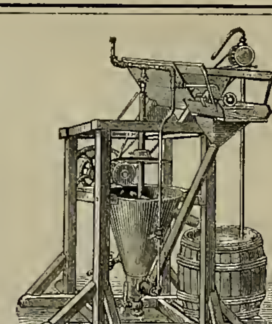

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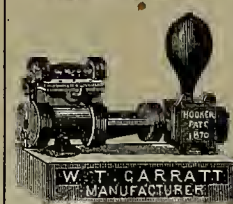

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, AUGUST 2, 1879.

VOLUME XXXIX Number 5.

An Ingenious Automatic Ventilator.

We illustrate herewith an ingeniously devised and curious automatic ventilator, recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency by Frank J. Crouch, of Eugene City, Oregon. Mr. Crouch is a young man of great ingenuity, and has invented a number of useful appliances of different kinds. This ventilator is his latest device. It is intended as an attachment to windows, transoms, etc., by means of which the opening or closing of the window or transom is automatically accomplished, in accordance with the temperature of the room.

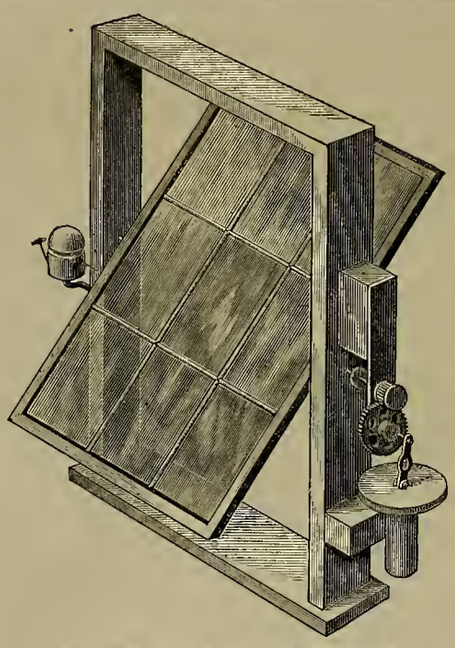
The sash or transom is hinged or swivseled to the frame, so as to swing in a circle on a central axis, and thus be opened or closed. This shaft or axis is continued through the window frame on one side. On its outer end is a pinion, which unites with a small spur wheel, as shown.

On the lower part of the frame is secured a pipe-cylinder or chamber, on top of which is a thin metallic plate. On top of this plate is another of the same size and shape, the two plates being secured together at their edges, and the space between them being filled with sulphuric ether, turpentine, alcohol or similar sensitive substance. The tube or cylinder opens into the chamber formed by these two plates through the lower plate, and also contains the ether or other substance. To the top plate of the disk is secured an arm, the upper end of which is fastened to a crank on the spur wheel.

Now, when the liquid in the cylinder and between the plates or disks expands, the plates are expanded as they admit of a sensible spring apart at the centers. As they are expanded or forced apart by the expanding substance, the arm attached to the upper plate operates the crank and gear wheel, thus rotating the pinion on the shaft or trunnion carrying the sash or transom, and the sash or transom is thus swung open. As the liquid cools, the reverse is the case, and the sash is closed.

The plates and cylinders are made preferably of glass, as it absorbs heat readily, and none of the chemicals used will corrode it. No dangerous effects are produced should leakage occur.

The plate and cylinder are placed inside the the room so as to be affected only by the temperature inside. When the room is heated the resultant expansion of the plates acting on the gearing will open the transom, and as the liquid cools, the plates come together, and close the transom, thus regulating the size of the opening through the transom or window in proportion to the temperature of the air. This durable and self-acting ventilator is adapted to hotels, theatere, halls and private dwellings, where good ventilation is desirable. On one side of the window frame may be attached a gong, so arranged that in case of fire or when there is any unusual heat, the movement of the sash will ring the bell to attract attention.



CROUCH'S AUTOMATIC VENTILATOR.

EBONIZING WOOD.—W. E. D. desires to know "the details of making the so-called ebonized wood for furniture and cabinet work. What kinds of woods can be used and how the finish is put on." 1. The wood may be dyed black by copperas and nutgalls, or by japanning with two coats of black japan, after which varnish or polish, or use size and lamphlack, previous to laying on japan. 2. Collect lamphlack from a lamp or candle on a piece of slate, or an ordinary China dinner plate. Scrape off the deposit, mix with French polish and apply to the object in the ordinary way. Any kind of wood can be used.

DEPARTURE.—We notice the departure of Mr. Henry Woodcroft Hammond from Virginia City for England. Mr. Hammond has for many years had large transactions in the wire-rope business, both with San Francisco and New York, and has been visiting his agencies on this coast, and as we understand, taking large orders from here. He is a nephew of the late Prof. Bennett Woodcroft, who was for 25 years at the head of the British Patent Office in London.

Quicksilver Production of California.

It is a sorrowful but acknowledged fact that when an important enterprise of any kind is inaugurated and begins to establish itself upon a paying basis, the bright anticipations of the originators are sat down upon by the ubiquitous tax collector. There is neither rhyme nor reason in any indirect crushing or smothering of any business to satisfy the ever increasing and never ending demands of taxes. The goose that lays the golden egg is killed to satisfy the rapacity of tax requirements. It seems sometimes that we need more tea thrown overboard by caricature Indians in order to stop the inequality of our burdens. Our remarks are, to a certain extent, applicable to the assessments upon the quicksilver production of California.

Five counties in this State contain quicksilver mines, and, with their production for the past three years, are as follows: Napa county, Redington mine, 25,494 flasks, assessed value per flask $15.89; Lake county, Sulphur Banks, 30,849 flasks, assessed value per flask $10.08; Lake county, Great Western, 14,266 flasks, assessed value each $9.84; Sonoma county, Oakland, 4,687 flasks, assessed value per flask $7.11; Fresno county, New Idria, 17,846 flasks, assessed value per flask $10.74; Santa Clara county, Guadalupe, 18,952 flasks, assessed value per flask $13.36; Santa Clara county, New Almaden, 56,488 flasks, assessed value per flask $17.66.

It would not be true to say that the stoppage of work on some of these mines is due wholly to the tax upon an enhanced valuation. But it is one of the reasons. Quicksilver has commercial value capable of being definitely ascertained, yet, in the valuation put upon the flasks, there are differences amounting to $10.55. New Almaden having an assessed value per flask of $10.55 more than the Oakland of Sonoma county.

The New Almaden has its entire property assessed upon a valuation of $997,645, while all the other mines combined are valued at only $1,334,894; and besides assessed per flask at $17.66. The total production of all of the quicksilver mines amounts, for the last three years, to 168,582 flasks. A large industry, and one productive of considerable income to the State. Mining property should bear its just proportion of taxes; but there is no property in the world so difficult to assess correctly. An immense capital may be sunk in mining property, and yet would be valued at a high figure, too high to be compatible with justice perhaps, and, in the case of our quicksilver mines, very far from the constitutional spirit of equal taxation. Our quicksilver mines deserve to be fostered, since their past has proved to be of so much importance to our general mining interests.

Footprints of Inventors.

If we could drop out of mind the mechanical world of the present and have the world of 100 years ago revealed to us, a vast and comparatively trackless plain would represent the industrial condition of the time. The only footprints visible are the shadowy ones of the geniuses of the day, searching for the connecting link between mind and matter. Coping with the material difficulties and laying aside all personal considerations, these footprints in the sand become more distinct as time approaches the present, until they become the footholds of progress, the beaten track which has led modern inventors to the apotheosis of mechanical ingenuity. The world would have existed without the inventor, a weakly, sickly world, Hamlet, with the part of Hamlet omitted. The elements of nature held in abeyance, awaiting the inventor's wand, would have rusted in oblivion, if poverty, toil and persecution had driven the inventive genius of man from the field. The element of light latent in a multitude of substances came forth obedient to the command of an inventor, and found a foothold towards progress in the lucifer match. The means of creating light called forth the inventor who could find a use for the application of that element, and illuminating facilities have developed into the brilliancy of the sun through the medium of that fearful power, electricity. And this is only a small portion of the inventive progress of man. Through all of the various gradations of progress, from the faint footsteps of the early inventor to the steady, heavy tread of the modern inventor, each one has established a foothold for the progressive discoveries of him who came next in the order of time, until it would seem as if perfection had been attained, but still the dim outline of future possibilities point the inventor incessantly to renewed exertions in solving the mysteries of the elements and in gratifying the never-ending demands of progressive humanity.

Mineral Exhibit at the Mechanics' Fair.

That the mineral products of this coast should be as fully represented as possible at the approaching exposition of the Mechanics' Institute is a proposition too obviously true to require argument. Of all our material products none more deserve to find a place in a grand display of this kind than these, none others being so generally interesting or thoroughly typical of our natural resources. What is being done officially to meet this necessity we are not fully advised. Dr. J. I. Bleasdale, who has for some time past been engaged in making a collection of minerals on this coast, will, we understand, place the same on exhibition at the Fair. This gentleman's collection, which is quite large and considerably varied, contains some specimens unique and rare, and will, so far as it goes, constitute an attractive feature in this line. This is a matter, however, that should not be left solely to private hands to be looked after, but should receive attention from the management itself.

There is in this city the material for making a creditable display in this department if only proper measures are taken for obtaining and preparing it for the use of the Institute. The Geological Society of this State has been working quietly for several years gathering ores, fossils and metals of every description. They have now on hand an immense quantity of these mineral treasures, boxed up and stored in a fire-proof building for safety. For the purpose designated the entire fruit of their labors would be placed at the disposal of the Institute, the Society being assured, of course, that they would be properly cared for and safely returned. These specimens to fit them for exhibition would require to be labeled and placed in cases, a work that could be safely committed to none but professional hands. To command the services of a proper person for this duty a suitable compensation would have to be paid; and here is where we suspect a trouble would come in, defeating the end here suggested. The management of these and similar expositions have been in the habit of getting this sort of service performed gratuitously, and looking for its continuance may be therein disappointed, for the self-sacrificing spirit of even the most enterprising becomes after a time exhausted. But this should not suffice to keep this valuable collection shut out from the public eye. Its presence would no doubt increase the receipts of the Institute beyond the cost of securing it.

In addition to this collection of the State Geological Society, or, in its absence, the splendid collection of Henry G. Hanks, might at a small outlay be secured for the uses of the Fair. This collection is very valuable and extensive, having been selected with care, and filling 40 large show cases. The Institute could hardly do less than procure this, engaging the owner to look after it while being displayed, and also give his attention, if need be, to other minerals on exhibition.

In our minerals repose the sources of our peculiar wealth, and to have them omitted or inadequately represented in a display of this kind, would evince a want of appreciation of their importance as well as a lack of State pride. We require these mineral products to be presented for inspection on these public occasions not so much as curiosities as for their economic and commercial values. Many of them are becoming important in our manufactures and useful arts and should therefore be studied and made widely known. In a large and utilitarian sense iron may be more valuable than gold, and a paving-stone of more importance than a diamond.

BIDS for supplying the U. S. mints with silver bullion were opened on the 24th inst., 600,000 ounces were offered. San Francisco bids were declined, being in excess of market rates. The largest proportion of silver coinage during the month of August will be done at the Philadelphia mint, owing to the inability to procure silver at market rates for the Western mints.

AN international exhibition of fishes and fisheries is contemplated at Berlin next year. The Pacific coast fishes should be represented.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS

Mining and Prospecting in Fresno Co.

EDITORS PRESS:—Disastrous to the farming intsrests of most of San Joaquin valloy as is the present dry year, following so soon the dry year of 1877, it is not an unmitigated evil, because it has tended to develop the mining rsources of our southern counties. The necessity for sheep raisers to take their stock for feed to the higher mountain regions summer after summer, bas not only called attention to the inexhaustible belts of the fiuest timber in tbe Sierras, but is occasionally leading to the discovery of valuable mineral ledges. In years of usual prosperity to stock and grain raisers but little thought is given to the ore veins found by sbeepmen in tbeir mountain wanderings, but a year like tbis makes many a farmer desert his unprofitable grain fields, and with necessary outfit of supplies and prospecting tools, follow our mountain streams to their sources in quest of gold and silver-bearing quartz ledges; some perhaps formerly found but almost forgotten, others to be discovered for the first time by white men. The year 1879 will long be remembered for the large amount of prospecting done hy former minsrs and others who have been following the plow of late years. This rush for tbe mountains and eager search for fissure veins, charged with tbe precious metals, began to some sxtent last year, and are already producing promising results, of which this and one or two succeeding letters will aim to give your readers some account. In Fresno county it is especially true, not only that some fiue ledges ars heing discovered, hut that several old mines are being more thoroughly and successfully worked. Former failures in some mining projects in this county bad, until recent development, generally destroyed confidencs in Fresno as a mining region. But now, in a quict way, Fresno prospectors and miners are putting in some good work, and results are likely to surprise the mining world.

The Two Centers

Tbat are especially attractiug attentiou iu mining circles here just now are the regions around Fresno Flats, and the North Fork and Minaret districts, along tbe beadwaters and tributaries of tbe Fresno and San Joaquiu rivers. The former district is from 30 to 45 miles northeast of the railroad stations of Borden, Madera and Berenda; the other two districts about 50 miles farther east and northeast, near points of location to be kuown bersafter as Highland City and Miuaret City. The latter points are withiu from six to ten miles of Mammoth City, Mono county, in the now noted Lake district, and tbeir interests will form tbe subject of a separate letter.

By common consent tbe

Enterprise Mine

Is the richest yet developed in the mountains around Fresno Flats. It is located on the south sids of Fresno river, about six miles hclow or southwest of the town of Fresno Flats. It was discovered in October, 1877, by E. B. Lovelace, a young man without experience in mining, who concluded to try his fortune at prospectiug. He and his partners, Chivell and Carrol, put up a simple arastra run by an overshot water-wheel 28 feet in diameter. By it they saved an average of about $40 per ton, aud continued working the miue until August, 1878, when they sold it to John Haley, the present Superintendent, a well-kuown mining engineer, who bonded and took charge of it in behalf of the present company. A tunnel, that had beeu ruu in 25 feet, has been extended by Mr. Haley to 150 feet in length, or 90 feet under ground. Tbe ledge, whose gangue rock is talcose slate, is from 3 to 12 feet wide and its dip is 70°. It is an interesting fact, that the celebrated Hite mine of Mariposa county is only some 14 miles distant in a direct line northeast, aud that the ore ot the Enterprise and Hite minos are very similar. The arastra and office are located about 2,900 feet above sea level, but a short distance above bed of river. The ledge runs diagonally across the hill to an altitude of some 4,100 feet, the hill facing northward with an inclination of about 45°.

From north to soutb the following

Openings Have Been Made

Under Mr. Haley's directions, some 18 meu being employed about the mine at prcseut:

1. There is a winze down on tbe vein 50 feet. Theuce a level is run north 48 feet. Here tbe ledge is six feet wide. This develops the richest free-milling ore yet fouud iu this mine, averaging some $400 per ton.

2. The ledge has been opened by cuts every 15 feet from that winze to center of claim.

3. At the center a winze is down 90 feet, intersecting the north end of tunnel already described. From the hottom of tbe tunnel the winze is extended 48 feet.

4. From center all along the line of ledge, openings are made at different intervals to the extreme south end of claim, where a shaft bas been sunk at au angle of 70° to depth of 36 feet. The ontire extent of the claim is tbe usual 1,500 feet, but Mr. Fairhanks, President of a hank in Petaluma, and a sharebolder iu the Enterprise, bas lately hought tbs nortbern extensiou of the ledge, 1,500 feet more, which also prospects very favorably.

5. A tunnel is heing run to strike tbe center of the Enterprise at a depth of 500 feet. It was commenced last March, aud 300 feet are already completed. Another tunnel will he run near the north end to strike the ledge at a depth of 1,000 feet.

Yonr readers will see that these various openings will command a large body of ore. The ledge is already proved to be a true fissure vein. Ore from most parts of the ledge has been tested in the arastra to the amount of several hundred tons, and none has produced less than $41 per ton. No ore has as yet heeu worked by any means hut the arastra, whose capacity is a ton and a half per day. But ore from tbe deepest part of ledge reacbed hy tunnel, and which contains sulphurets from which the surface ore is clear, bas been assayed, and yields from $500 to $900 per ton. It is proposed to put up a stamp mill, so soon as ore is struck by the tunnel now in course of construction, and is found to be valuable. It will be located near the mouth of central tunnel. It is safe to say that, if the ore at 500 or 1,000 feet proves to be half or a fourth as good as the surface ore, the Enterprise will be one of the most valuable mines in California. The gold from tbis mine is remarkably fine, its value beiug $19.16 per ounce. Ths surface quartz, containing it in large flakes and grains, is glossy, and very mucb reddened by oxide of iron. In short, it is just sucb quartz in appearance, as most miners would pass by as unworthy of notice. At greater depths the quartz becomes whiter. It and the gangue rock enclosing it are very similar in general appearance to tbat from A. O. Bell's mine near Auburn, Placer county, which I described in your columns two years ago.

The Confidence Mine

Is located about 12 miles, by road, below Fresno Flats. It is owned by Messrs. Carroll, Morton and other parties, near Merced City. No work is going on tbere at present, but Mr. Morton informs me that the company proposes to renew operations soon. A 10-stamp mill has been erected there. Part of tbeir ore has produced as much as $200 per ton, and the ledge is generally considered a good one.

The Texas Flat Mine

Is located in Coarse Gold gulch, some six miles southwest of Confidence mine. A sbaft 185 feet deep bas been sunk tbere but no work is going on at present, except to keep the shaft from filliog with water.

Spangled-Gold Mine,

On a gulcb of the same name, is nine miles west of the Confidence. It is owned by Messrs. Hogue & Wagner. Its ledge is from two to five feet wide. A tunnel and cut along tbe ledge have heen completsd some 250 feet, and part of the ore milled has averaged $55 per too. A two-stamp and two arastras are now in operation tbere.

In and near

Fine Gold Gulch,

About 15 miles southeast of Fresno Flats, several mining enterprises are heing pushed ahead steadily. Near Quartzburg are the shafts, tunnel and 5-stamp mill of the Fresno gold mining company. Their mill was erected over a year ago, and is run hy water power. Tbey think of doubling the number of stamps soon. Eleven sbafts have already beeu suuk from 50 to 100 feet. A tunnel bas heen completed 100 feet, following a quartz lode in granite walls, and has developed some of the best ore yet found. In the latter silver bas heen discovered for the first time iu this locality, the ore yielding about $57 in gold and $21 in silver. Since March last a considerable amount of decomposed quartz bas heen found in all the sbafts, aod this contains some free gold. The average of such ore as has heen worked is about $30, some going as bigh as $400 per ton. Altogetber the mine is yielding satisfactorily. In widtb the vein in tbe tunnel varies from six incbes to four feet; in the shafts from eight inches to four feet. It is believed that all ore yet found here is merely from surface ledges, aud the owners are still searcbing for the mother veiu. Messrs. De Frees & Hazeltine, tbe principal owners, are now East. On their return it is proposed to run a tunnel for the purpose of cutting the main lode at the deptb of 400 feet.

About a half a mile above tbis company's mill Messrs. Hampton & Galt are working the "Wbite Rock Vein." A tunnel for drainage is already in 260 feet. Tbeir's is free milling ore containing some sulpburets and oxide of iron; also some decomposed quartz. Five or six men have been employed on this work since April. An assay in May gave $283.77 gold and $13 silver, as I am informed hy Mr. John Galt. Part of their ore is crushed in their own arastra, though some of it is crushed by the Fresno company's mill. Mr. W. P. Litten, foreman at the mill, also has charge of tbe

Quartz Mountain Works.

Quartz mountain is about three miles west of Quartzburg. Mr. Litten informs me that some 20 acres of gold-bearing quartz are exposed on this mountaiu, tbat it is generally low grade ore on the surface, averaging from $6 to $18 per ton. The vein is from 2 to 14 feet wide, has a general dip of 40° northward, and sbows no signs of silver as yet. The right to 3,000 inches of water has just heen located to run a large stamp mill soon to be erected at Quartz mountain. By aid of pipe and flume this water will be conveyed over 14 miles from a tributary of the San Joaquin. Another company has commenced a tunnel opposite Quartzburg to reach the Indicator ledge, and the Harlow, Lewis and Baker ledges, not far from the same locality, are said to prospect favorably.

You see then tbat the mining interests of tbis part of Fresno county are no longer slumberiug, hut that a renewed activity prevails, and results are obtained wbich augur well for the future.

J. W. A. W.

Fresno Flats, July 3d.

How to Explore for Minerals.

Mr. J. E. Clayton, mining engineer, contributes to tbe Salt Lake (Utab) *Tribune*, tbe following items on prospecting for minerals:

1st. Examine the gravel and boulders of tbe mountaiu streams, and note carefully the structure and cbaracter of the gravel wasb. This will reveal the geological formations tbat are intersected by tbe stream. Try the sands at the head of tbe gravel bars for free gold, or for any crystallized minerals, etc. If the structure of the qnartz houlders or otber vein stones are favorable, go up tbe stream until the geological zone is found that bas produced tbe quartz or otber metal-bearing minerals. Tben follow the supposed metal-bearing zone on its line of strike and make especially careful examinations wherever eruptive dikes are found intersecting the formation.

2d. Wben a lode or vein is found, note carefully its relation to the country rock, especially any differences in the opposite walls of the vein. Tbeu follow it on the line of outcrop, and note carefully those points where the best ores are seen, so as to determine the position of tbe best ore-chutes before making any location on tbe lode.

3d. Tbe first work should consist of sballow cuts across tbe lode at intervals of 50 to 100 feet, or, if the vein is small aud partially covered by soil and debris, a trench aloug tbe line of outcrop is preferable. If the surface tracing is satisfactory and the trne line of strike bas been determined, then survey your claim and stake off tho boundaries according to tbe requirements of tho United States laws.

4tb. The work of exploring the vein underground is tbe next thing in order. To do this intelligently, you must select that point on the line of outcrop where the best ore is found, then sink a shaft on the lode following tbe angle of dip, keeping hoth foot wall and hanging wall exposed if possible. If the lode is too wide for this to be done, then follow tbe best ore streak of the vein itself, and at every 50 feet in depth make crosscuts to the walls of the vein. After 100 feet has been reached, run lovels each way from tbe sbaft on the line of the veiu, in order to determine the extent or spread of the ore chute or chimney on the horizontal line. When the limit of tbs ore body on the horizontal line has been ascertained, then sink 100 feet more, and drift right and left as before. If more than one chimney of ore is found on the line of ths vein, a shaft should be sunk on it and drifts run as above stated, being careful to confiue all the exploring work within the walls of the vein itself. When enough has heen done to prove the character, size, and quality of the vein, it will tben he time to determine the position, character, and extent of the "dead work" necessary to work the mine to the deep. These questions should he settled hy careful surveys, made in the light of all the local facts and surroundings, such as the geological structure of the country rock, tbe probable amount of water to be raised, the lowest point of drainage by adit, or level, and the most convenient point for delivery of tbe ores to the surface, etc.

Tbe last part of the preliminary exploration of any mine is to determine, by actual tests, what are the hest metbods of reduction, and the extent and kind of reduction works needed, etc.

5th. After all these preliminary facts have been thoroughly ascertained and clearly defined, tbe unavoidable risks of mining will have heen fully met and overcome. All subsequent operations are simply matters of skill aud business management, and the capitaliziug of the mine becomes a mere matter of business detail.

The requirements are as follows:

1st. The preliminary exploration must have ore enough cut and underrun, or otherwise exposed, to give at least two years' work for reduction works of an extent sufficient for tbe average annual output of ore.

2d. The reduction works must he suited for the hest treatment of the ore.

3d. The exploration of tbe mine must be pushed ahead of extraction of ore, so as to expose at least one ton of ore in new ground, for every ton extracted from the previously explored ground.

4tb. Before erecting reduction works, the ore exposed in the mine should be so thoroughly tested as to guarantee a net profit sufficient to pay the whole cost of sucb works.

5th. The miue heing well opened, and tbe reduction works, or plant, estahlisbed, the general success of the enterprise must depend upon tbe efficiency of tbe general business management.

SNAKE RIVER MINING.—The claims are located in 20-acre lots, principally owned hy San Francisco and Salt Lake capitalists. The country is said not to be desirable for prospectors. Tbe gold, however, is very fine, hut can only be saved by using tbe electro-plate.

Rights of Ditch and Canal Owners.

In 1873, S. Jennison, the testator of R. B. Titcomh, constructed a ditch in Placer county, California, to convey tbe waters of a canyon to a mining locality known as Georgia hill, 17 miles distant, for mining, milling and agricultural purposes, and for sale. The intention of the testator wben he appropriated the water rigbt was to divert 2,000 incbes of the water of the canyon by means of a flume and ditch. In its course, the ditch crossed Fulweiler's gulch, tbe waters of which had been already appropriated by J. T. Kirk, who bad constructed ditches, one of whicb was intersected by tbo testator's ditch, which diverted the waters from it. Kirk thereupon repaired and reopened bis own ditch, turning into it the waters which had previously flowed in it, and in so doing eut and washed away a portion of the ditch of the testator, so as to let out tbe waters brought down from tbe canyon above and the intermediate streams. Tbe testator hrought suit against Kirk for damages and to restrain the continuance of the injury to his ditcb. Tbe case was carried to the Supreme Court of tbe United States and is the case entitled S. Jennison, executor of R. R. Titcomh, vs. J. T. Kirk.

It appears from tbe answer of Kirk, which the court finds to bo correct in tbis particular, that he and bis predecessors in interest had been in possession of a portion of Fulweiler's gulch for many years prior to this suit, and the ground was continuously held and worked for mining purposes, and as a mining claim, according to the usages, customs and laws of miners in force in tbe district; that the "hydraulic process" was used in working tbe claim and extracting the gold, for wbicb a large volume of water was necessary; and that the plaintiff's ditcb rendered the gold-bearing earth and gravel inaccessible, and practically destroyed the working of the mining ground.

It was admitted that defendant's right of way for his ditch was superior to that of plaintiff; and it was also admitted that the extension of plaintiff's ditch across tbe defendant's claim prevented tbe successful working of the mining claim. But it was contended that as the land over which the ditcb passed and on whicb the claim is situated was a portion of the public domain of the United States, that the right of way for the ditcb was superior to the right to work the claim, such superior right being conferred by the uintb section of the act of Congress of July 26tb, 1866. That section enacts:

Tbat whenever, by priority of possession, rigbts to the use of water for mining, agricultural, manufacturing, or other purposes, have vested and accrued, and the same ars recognized and acknowledged by the local customs, laws, and the decisions of courts, the possessors and owners of such vested rights shall be maintained and protected in the same; aud tho right of way for the construction of ditches and canals for tbe purposes aforesaid, is hereby acknowledged aud confirmed: Provided, however, that whenever, after the passage of this act, any person or persons sball, in the construction of any ditch or canal, injure or damage the possession of any settler on tbe public domain, the party committing such injury or damage shall be liable to the party injured for such injury or damage.

The court pronounced the plaintiff's position untenable and held: 1. That tbis section only confirms to tbe owners of water rights and of ditches and canals on the public lands of tbs United States the same rigbts which they held under tbe local customs, laws, and decisions of the courts, prior to its passage; and, 2. That tbe proviso confers no additional rights upon tbo owners of ditcbes subsequently constructed; hut simply renders tbem liable to the parties on the public domain whose possessions may be injured hy sucb construction.

The section is to be read in connection witb other provisions of the act of which it is a part, and in the light of matters of public history relating to tho mineral lands of the United States. The law of miners recognized discovery, followed by appropriation, as the foundation of the possessor's title, and development by working as the condition of its retention. By tbat law the owner of a mining claim and tbe owner of a water right in California hold their respective properties from the dates of their appropriation, the first in time heing the first in right; hut whose hoth rights can be enjoyed without interference with or material impairment of each other, the enjoyment of hoth is allowed.

By that law a person cannot construct a ditcb to convey water across tbe mining claim of another, taken up and worked according to that law before the right of way was acquired by the ditch owner, so as to preveut the further working of the claim in the usual manner in wbicb such claims are worked, nor so as to cut off the use of water previously appropriated hy the miner for working the claim, or for otber beneficial purposes.

Accordingly, where the owner of a mining claim worked by the method kuown as "the hydraulic process," cut and washed away a portion of a ditch so as to let out the water flowing in it, the ditcb having heen so constructed across the claim previously acquired as to prevent it from being further worked by that method, aud to prevent the use of water previously appropriated by him. Held, that tbe cutting and washing away of the ditch, it having been done in order that the claim might he worked and tbe water used as before, was not an injury for which damages could he recovered. And judgment in favor of defendant was affirmed.

MECHANICAL PROGRESS.

The Electric Light in Photography.

The idea of photographing by the electric light has long been entertained, but the light emanating from a single point renders the shadows too abrupt, and the contrasts too great, to admit of using it in making photographic portraits. Recently, however, the invention of our countryman, Mr. Vander Weyde, for some time in practical use in London, has been introduced in Paris by Mr. Liebert, which diffuses the light, renders it soft and mellow, and imparts to it the particular quality required in making photographic portraits. Not long since we alluded to the fact that it had become quite the fashion in Paris for parties of ladies and gentlemen to resort to photographic studios, after dinner or before the opera, for the purpose of sitting for photographs.

The light used for the purpose is that of the voltaic arc, the lamp being placed in the huge concave reflector suspended by a system of pulleys, levers and counter-weights, so that it may be readily adjusted or moved about. The reflector is made of opaque porcelain, lined with paper stucco, which is tinted blue. The carbon pencils between which the voltaic arc is formed are placed almost at a right angle to each other. The light has normally a power equal to about 300 or 400 Carcel lamps, but it can be made more powerful by increasing the speed of the Gramms machine.

The light of the voltaic arc is twice reflected. A small reflector placed in front of the lamp throws the light upon the interior surface of the large reflector, whence it is thrown in any required direction according to the will of the operator. The carbons are adjusted by means of screws, so that the maximum effect of the current may be realized, and flickering and variations in the light avoided. The Gramme machine used in connection with this apparatus is driven by a five horse-power gas motor.

A photographer provided with this apparatus is not at the mercy of the weather, neither is he controlled by the time of day, as he has the absolute management of the light. This arrangement of the electric light might be used to advantage in illuminating public places, railway stations, theaters, etc., as the light is very powerful, and yet so diffused that it does not pain the eye.—*Scientific American.*

ELECTRO ENGRAVING MACHINE.—It has baffled the skill of inventive genius for ages, to produce a machine that would compete with the skillful hand engraver. Guerrant, after much study in trying to perfect such a machine, has, by the aid of electricity, succeeded in producing a practical machine, which it is claimed has no rival. The construction of the machine is not complicated, but simple and durable. It is easily operated—any person of ordinary mechanical skill can learn to work it in a short time. There is nothing to do but turn a crank forward and back, after the work is fixed in the machine. The variety of work that may be accomplished by it is said to be unlimited. It copies from the regular press type of *any* style of letter or design that is made of type; from the plainest to the finest German text letter, or fancy design; and at the same time, it will reduce the letter or design from the original size to ten different sizes, or so small that it cannot be seen by the natural eye. It will shorten the letters or elongate them; also, will lean them forward or backward; will either make a raised or sunken letter; will engrave on any surface, either plain, concave or convex—for instance, such things as watch-cases, either in or outside, finger rings, either in or outside, bracelets, napkin rings, goblets, pitchers, mugs, waiters, spoons, forks, and all kinds of jewelry; or, in fact, any article susceptible of being engraved or ornamented with scroll-work and fancy designs, etc., either on gold, silver, copper, brass, iron, hardened steel, glass, stone, pearl, ivory, bone, gutta-percha, etc. The machine is capable of doing the most difficult kinds of engraving, and on the most difficult metals and substances to be engraved.

A NOVELTY IN LAMPS.—The Committee of Science and the Arts of the Franklin Institute lately passed a very favorable judgment upon a mechanical lamp of peculiar construction, known as the Hitchcock lamp, and designed to burn heavy fat or greasy oils without a chimney. Mechanical lamps are not altogether new. The well-known Carcel lamp, the oldest, and perhaps the best known of its class, which is also designed to burn fat oils, is provided with a mechanical movement which pumps the oil up to the wick from the lamp body, while the air-supply is obtained by the use of a chimney of glass. An American lamp (the immediate predecessor of the Hitchcock), known as the Jones & Hitchcock lamp, is designed to burn kerosene without a chimney, and effects its object by means of a mechanical movement, which (unlike the Carcel) furnishes the air-supply to the flame, the oil being supplied to the wick by capillary action. The Hitchcock lamp presents the novelty that the mechanical movement performs both these functions—supplying the air and feeding the oil simultaneously. The committee's report makes special reference to the mechanical excellence displayed in its construction, and places its illuminating power, when consuming 922.4 grains of lard oil per hour, at 16.9, or nearly 17 candles. The form of lamp examined by the committee was designed especially for railway cars.

IMPROVEMENT IN ELEVATED RAILROADS.—Peter Cooper, of New York, makes the subject of a long letter, addressed to the press, the improved methods of rapid transit. To obviate the annoyances attendant on the present system of elevated railroads, he advocates the adoption of a plan of which the salient feature is the use of an endless chain. After considering the advantages of this method of propelling the cars, he recommends a plan for the noiseless running of the cars over the rails. The constant pounding of the wheels in passing from one rail to another is to be avoided by the use of a chair which will give support to the wheel. The wheels themselves are to be made with a groove over the whole face, which is filled with hard gutta-percha. "An elevated railroad so constructed," Mr. Cooper says, "with the propelling power under the ground, and the rails so arranged as to take up the momentum in stopping and hold it ready to be given out in starting, with the wheels of the cars covered with gutta-percha, working on gutta-percha coverings, and the rail held in a firm grasp in an India rubber chair, so that it would not touch iron in any of its parts, would have nothing to convey sound except the mere rubbing of the flange against the side of the rail. This rubbing could be avoided mainly by the shape of flangs." The advantages claimed for this method of rapid transit are the small cost of operating, absolute safety, and the perfect freedom from noise, sparks, dust and gases.

A LARGE SUGAR MILL.—One of the largest sugar mills in the world is soon to be erected in St. Charles parish, Louisiana. The total weight of this mill, including engine, will be 300,000 pounds. The latter will be of about 300 horse-power. The rollers are to be seven feet long and 40 inches in diameter, weighing each 18,000 pounds, or all 54,000 pounds. The shafts are of wrought-iron, 18½ inches in diameter and 20 inches long. The housings, made of the best gun-metal, are each 14 feet long, with 18-inch face, and will weigh 54,000 pounds. The mill will be double-geared—that is, run with two sets of pinions and spur-wheels of enormous size and weight. The shafts of all these wheels, with that of the fly-wheel, will be of the best wrought-iron, while the journal bearings of the roller shafts in the housings will be manufactured of the purest Babbitt metal. It is estimated that with this machinery there will be a gain of more than 30% on the work of the ordinary mills. A number of single or three-roller mills and a few five-roller mills have been erected in the State recently.

WRITING TELEGRAPH.—The writing telegraph which reproduces the messages sent, in almost perfect *fac simile* of the sender, has been fitted up between Waterloo and Woking, a distance of some 26 miles, and according to the *Echo* has been working very well. The instrument itself is too recent an invention to have yet reached even an approach to perfection, but the defects made evident in practical working have so far been remedied, and it is clear that a useful improvement will shortly be available. One great advantage is that the instrument is quite automatic at the receiving end, and does not require the constant attendance of a clerk. It writes in messages on a roll of paper, and they can be cut off and sent to their destinations as opportunity offers. That is an important point, because it is well known that the time wasted in calling and in obtaining the attention of the receiver far exceeds that required for the actual sending of the messages.

EDISON'S ELECTRIC-CHEMICAL TELEPHONE.—This new invention of Mr. Edison dispenses with the necessity of holding the telephonic receiver to the ear, and besides furnishing a greater volume of sound, renders distinct the slightest peculiarities of the voice. It has been found to work perfectly at a distance of 50 miles. The improvement consists in causing the current to pass through a spool of chalk containing crystallized caustic soda, and having a thin tongue of steel resting upon. The chalk is mounted on a shaft turned by a crank, thus creating friction, and when so operated, the current passing through the spool, polarizes the chemical agent, and is thence transmitted through the steel tongue to a thin metallic diaphragm. The current only flows so long as the crank is turned. It is Mr. Edison's intention to furnish clock-work for the mechanical movement, so that it may be stopped and started by electricity at the will of the operator.

INVENTIONS.—F. M. Wilson, of Tekamah, Nebraska, has invented an improvement in windmills, consisting of an arrangement of an eccentric and double-crank shaft, by which it is claimed a much larger percentage of power is realized than in the ordinary mills. An improved wharf for rivers, harbors and lakes is a new invention of Mr. S. Howell, of New Orleans. It consists in the combination of metal straps with the mortised cross pieces and stringers of a wharf, and other novel features of construction, which render it possible to build wharfs of any desired length and size in a shop or enclosure and afterward to put them up very quickly. An improved oscillating pump has been devised by Daniel Palacios, of New York city. The pump cylinder is connected at its lower end with a hollow rock shaft or pipe, which communicates with the pump valves. The piston rod is connected with a crank on the pump-driving shaft.

SCIENTIFIC PROGRESS.

Heat and Electricity.

Mons. Clamond, a French electrician, has succeeded in producing valuable lighting effects from his thermo-electric pile. This is a confirmation of the fundamental laws of energy, viz., that all forms of energy are convertible.

In every electro-dynamic machine now in use considerable loss occurs at every conversion and re-conversion of energy or motion. There is a loss of 90% of the source of energy in the dynamo-electric plant. No machine in the market realizes more than from 25% to 30% in electrical energy units, of the mechanical energy units required to drive it. The balance is lost in the friction and resistance of the high speed at which the machine must be driven, and in the loss by leakage, and in the opposition of the electric currents generated.

Hence, the deplorable result, that in the usual dynamo-electric plants there is not more than 2½% or 3% of the original heat energy realized as electricity.

Thermo-electricity is the branch of electricity in which least is known, and in which hardly any data have been given to the world. It had been discovered long ago that when two diverse metals were united and subjected to heat at their junction, a current of electricity was generated from one metal to the other, and this was called thermo-electricity. The amount and character of this electric current is found to vary with every variation in the particular metals used, and also with their shape and area. Although the principal metals have been arranged in an order as to their relative so-called plus and minus qualities, and it has also been defined that the current of electricity is better, as the pair have most opposite characters to one another, we believe that there have never been any published definitions as to what constitutes the plus or minus character of the metals, or in what way the current may be affected by the shape, area, thickness or method of connection of the pairs, constituting a pile or battery when in combination.

There is thus an enormous field of research open in this direction, and we believe an excellent reward for those who may discover the above laws. By the use of a thermo-electric battery, one very large source of loss will be eliminated altogether, compared with a dynamo-electric machine. The 90% loss due to the use of a boiler and steam engine may thus perhaps, in a considerable degree, be saved. The economy of the arrangement would depend upon whether the fuel or heat could be retained in contact with the metal pairs, so that the largest possible proportion should be absorbed, and that the electricity should be generated of the particular character required, and without leakage or polarization of the couples.

Electro-dynamic machinery is only the commencement of a succeeful grappling with the problem of electric lighting.—*Universal Engineer.*

UTILIZATION OF CAOUTCHOUC OIL.—Danckwerth & Koebler, of Petersburg, prepare this oil by submitting waste India rubber to dry distillation over an open fire, with the aid of superheated steam. A product is thus obtained which, when inspissated and galvanized, possesses in the highest degree the properties of good natural caoutchouc. The lighter oils, which serve for the preparation of varnish, are separated from the heavier ones, which are mixed with hemp or linseed oil, and boiled down. Dupuis, of Paris, proposes to improve goods, dyed in the vat by the application of a dry stove heat, or of steam, or superheated steam. The shade, and sometimes the intensity of the colors is often decidedly modified, though it does not appear in what direction. He prefers hot air for wool, and steam for cotton and other vegetable fibers. The temperature of the air or steam may be from 212° Fahr. to 302° Fahr., and the time of exposure is from half an hour to two hours, or upwards. J. Natbansohn, of Berlin, has patented the following process for coating silk yarns with metals: The yarns, when dyed in the usual manner, are steeped in a cold solution obtained by dissolving half a pound of gelatine in 10 gallons of boiling water. They are next steeped in a similar solution, to which bronze powder of any desired color has been added. After being wrung and dried they are taken through a solution of wax in benzine and dried again.—*Chemical Review.*

TESTS FOR BUTTER BY LIGHT.—A writer in the *Hannoversche Monatsschrift* is even more sanguine than Mylius, who first proposed the examination of butter by polarized light, of the value of his method of testing the purity of butter. Under such light the peculiar crystals come out very distinctly. He has discovered that different fats, like the minerals, produce characteristic marks whereby they can be determined in the polarization colors, and he intends soon to publish plates showing the peculiar forms and colors of each fat, whether raw or melted, or crystallized from glycerine. Mutton tallow gives a blue tone; ox fat, green and white; hog's lard, red and blue, with other colors not so intense; cacao butter, a play of color from the deepest red to the brightest green. Besides being useful as tests of the genuine nature of butter, these optical reactions are said to be available for the detection of foreign fats that may be fraudulently added to chocolate or cocoa.

FOSSIL FOOTPRINTS IN COAL.—At the last meeting of the New York Academy of Natural Sciences, Dr. Joseph Leidy read a letter from Mr. W. Lorenz, chief engineer of the Philadelphia and Reading Railroad Company, referring to a fossil specimen presented to the academy by Mr. William D. H. Mason, of Williamstown, Pa. The specimen is a mass of coal shale with footprints, and was discovered by the donor at the Ellengowan colliery, in the Mahanoy coal field. Mr. Lorenz remarks that it is of special interest as having been the first specimen of the kind found in the anthracite coal field. The specimen is an irregular slab, upwards of a foot long, and less than half the breadth. The upper surface is obscurely ripple marked longitudinally, and is crossed in a slant by seven tracks, which are in pairs, except one, in advance on the right. The four tracks on the right occupy a line of six inches, and are about an inch and a half apart from those on the left. The more perfect impressions exhibit four widely divergent toes, successively increasing in length from within outwardly, excepting that the fourth toe is slightly shorter than the third. The expanse of the tracks is about one inch. The impressions probably portain to some salamandroid animal; and as it had been found useful to refer to fossil foot tracks as the representatives of the animal by which they were made under distinct names, he would in accordance with a suggestion from Mr. Lorenz, name the form represented by the Ellengowan anthracis.

ESTIMATING METALS IN ORES.—At the late meeting of the Philadelphia Academy of Sciences, Prof. G. A. Kœnig exhibited his recently invented "chronometer," an instrument designed for the purpose of making delicate determinations of the presence of certain metals in ores. It is based upon the optical fact that complementary colors extinguish each other if mingled in proper proportions; for instance, if to a green solution a red solution be added, the liquid, if the proper conditions be complied with, will become colorless. Prof. Kœnig has applied this principle to the colors which certain metals, as iron, manganese, copper, etc., produce when fused with borax, which is the only chemical used in this method of analysis. He prepares glass or beads containing known quantities of a metal in 100 parts, and observes how thick a glass of one complementary color must be to produce extinction. To accomplish this the instrument is furnished with a glass wedge of a green or red color, cut at an angle of about one degree. By moving this wedge before the glass bead, with the help of a suitable rack movement, a scale moves at the same time, and when the point of the extinction of color is arrived at the reading of the scale refers to a table showing the percentage of metal contained in the examined substance. By this method of analysis a correct determination of manganese in an iron ore can be made in 15 minutes, or copper estimation in 30 minutes.

STEEL IN THE BOILER OF THE FUTURE.—Steel can now be produced by either the "Bessemer" or the "Siemens" process, surpassing in tensile strength and in the power of bending and twisting, for flanging, any best brand iron known, the metal produced by either of these two processes being of a purer and more homogeneous nature than can be made by any of the older methods. The best American boiler plate is said to have a rupturing strain of 70,000 pounds, or 31 tons per square inch of section. The ordinary plate for locomotive boilers is stated to be capable of bearing a strain of 60,000 pounds, or 27 tons per square inch. Steel boiler plates, having very great cohesive properties, have been made in England and in South Wales. It is stated to have a tensile strength of 45 tons per square inch, and to be capable of producing the highest class of steam boilers. As a rule, English boiler plates are of two classes—Yorkshire and Staffordshire; these, however, include the make of other districts. The maximum strength for locomotive boiler plates are as follow: Best Yorkshire iron plates, 25 tons per square inch; best Staffordshire iron plates, 20 tons per square inch; best American iron plates, 31 tone per square inch; ordinary American iron plates, 27 tons per square inch; English steel plates, 40 to 45 tons per square inch.—*Universal Engineer.*

PETROLEUM FUEL FOR STEAMBOATS.—On July 15th, the first known attempt to use petroleum as fuel on board a steamer was tried at Pittsburg, and the result was very satisfactory. The *Telegraph* says: "The little steamer *Billy Collins*, lay in the Allegheny river this morning with 80 pounds of steam in her boilers, and not a bit of smoke in her stacks, ashes in her pans or clinkers in her fire-box. A few gallons of 63 cent crude oil had run out of a barrel on her guards, and was converted into a waving flame 10 feet long under her boiler, by a little device recently patented." The trip was made a few days ago, and everything passed off satisfactorily. The patent is the invention of a Pittsburg man.

NEW USE FOR OLD CLOTHES.—A manufactory in Germany turns out 1,000 pounds of grape sugar a day, made from old linen. The old linen, which is pure vegetable fibrine, is treated with sulphuric acid, and converted into dextrine. This is washed with lime water, and then treated with more acid, and almost immediately changes and crystallizes into glucose or grape sugar—which is highly valued in the making of rich preserves and jellies.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending July 10		Week Ending July 17.		Week Ending July 24		Week Ending July 31	
Alpha	28	25½	26⅞	25½	25½	21	25¼	19
Alta	12½	9	11	8¾	8½	6¼	7⅞	6½
Andes	1¼	1.15	1.20	1	1.05	60c	1	80c
Alps	....	....	....	....	....	....	....	....
Argenta	1	85c	1.05	90c	1.65	1.30	1¼	1
Atlantic	40c	....	35c	....	....	....	....	....
Aurora Tunnel	60c	50c	50c	20c	50c	40c	50c	....
Baltimore Con	....	....	....	....	....	....	....	....
Belcher	6¼	4.95	5⅞	4.90	5	3.80	4.30	3.95
Belmont	40c	....	50c	40c	40c	....	40c	30c
Best & Belcher	20	18	18	16¾	17¾	15¼	17⅜	16
Bullion	7⅞	6	6⅞	6⅜	6¼	4.80	5⅝	3.95
Bechtel	2½	2	1.95	1.60	1.80	1¼	1.60	1¼
Belle Isle	2½	1.65	2.90	2½	4.80	3¼	4.40	3¼
Bodie	22	20¾	20½	18½	17¾	11¾	14	11
Benton	8⅞	6½	7¼	6⅜	5¼	4	4½	3⅞
Bulwer	9	....	8½	8	9	6⅞	9	8¼
Boyle	....	....	....	....	....	....	....	....
Black Hawk	2	1⅜	1.70	1	1½	1	95c	75c
Belvidere	1½	1	2¼	1.10	1.10	90c	1	95c
Booker	1¼	1.10	1⅛	85c	1.10	95c	90c	50c
Caledonia	2.60	2¼	2.40	2.05	2.35	2.05	2.20	2
California	5	4¾	4.90	4¾	4.95	4.60	4.95	4⅞
Challenge	2¾	2½	2.60	2	2.40	2.10	2½	2.15
Chollar	8	6¾	7¼	6	7	6	6⅝	5⅞
Confidence	12½	12	11½	10¼	11	10¼	11	10
Con Imperial	1.95	1.60	1⅞	1½	1.65	1¼	1.40	1.15
Con Virginia	5	4½	4.85	4.65	4.60	4.60	4.70	4.60
Crown Point	5⅜	5	5¼	4.90	5	4	4.40	4
Con Washoe	....	....	....	....	....	....	....	....
Champion	75c	55c	80c	55c	90c	50c	70c	50c
Concordia	....	....	....	....	15c	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	25c	....	20c	15c	20c	15c	15c	....
Daney	....	....	....	....	....	....	....	....
Day	35c	30c	30c	20c	20c	....	20c	15c
Eureka Con	16½	15¾	16½	15½	16	15	15	14⅝
Exchequer	7⅞	6⅝	7	6¼	6	5	5⅞	5
Endowment	35c	....	45c	35c	45c	40c	....	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	3.90	3.80	4	3½	3.90	3⅝	3¾	3.60
Gila	1	1.15	1.10	1	1¼	1.05	1⅞	1⅛
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	13½	12	13⅞	....	13⅞	....	14	13
Goodshaw	80c	45c	50c	40c	50c	40c	40c	25c
Gould & Curry	12¾	11¼	10⅞	10¼	10	8	9¼	8¼
Hale & Norcross	17¼	14½	16⅛	12½	14¾	11⅞	13	10⅞
Hillside	1¼	....	1⅞	1½	1¼	....	....	....
Highbridge	25c	....	25c	20c	20c	....	20c	....
Homestake	....	....	....	....	....	....	....	....
Hussey	25c	20c	25c	15c	20c	15c	15c	....
Independence	2¼	2¼	2.55	2.30	2.45	1.80	2.15	1.10
Julia	4¼	3¼	3⅞	3½	3.60	3.05	2.95	2.55
Justice	5¼	4½	5½	4½	5¼	4.15	4.20	3.60
Jackson	5	....	4¼	4	4	....	3¾	....
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	4½	4	4.60	4.10	4.30	4	4½	3.90
Kossuth	....	....	....	....	15c	....	20c	10c
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	1.40	1	1.20	90c	1	75c	1.30	95c
Lady Wash	2.80	1⅞	2	1⅞	1.70	1¼	1.40	1.15
Leopard	1.20	90c	1.60	1	1.60	1.20	1.40	1
Leviathan	75c	65c	65c	55c	55c	40c	40c	30c
Leeds	1	....	80c	70c	75c	....	75c	....
Lee	....	....	....	....	....	....	....	....
May Belle	50c	....	40c	30c	40c	....	30c	....
Modoc	....	....	....	....	1	....	1	....
Manhattan	3	2¼	3.10	2⅞	2⅞	2½	2¼	2
Martin White	6	5⅞	6	5⅝	6	5¼	6	5¼
McClinton	1.40	1¼	1½	1¼	1.30	1	1½	1
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	25⅞	24	26⅞	23	25⅞	21	24⅞	20¼
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	....	....
North Con Virginia	9⅛	9	9¼	9	9¼	9	9⅞	9
New York	1.15	70c	75c	60c	60c	40c	50c	40c
Northern Belle	5¼	5	5	4	4.95	4⅞	1.40	4.15
New Coso	....	....	....	....	....	....	....	....
Navajo	40c	30c	45c	40c	50c	40c	40c	35c
Occidental	1	90c	1	85c	1	90c	90c	80c
Ophir	31½	29	37	31	36½	30¼	32½	29½
Oriental	25c	....	25c	20c	15c	10c	45c	10c
Overman	11	9	10¼	9	9¼	6¼	9¼	6
Panther	....	....	....	....	....	....	....	....
Phenix	3	....	....	....	....	....	....	....
Phil Sheridan	70c	....	....	....	....	....	45c	....
Potosi	5⅞	4½	5	4¾	4.95	4.15	4½	4.05
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	4	3.90	4.10	3.90	4	3	4	3.90
Richer	1¼	40c	90c	60c	75c	50c	55c	50c
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	15⅞	13½	14⅝	12½	14	11¼	12	10¼
Seg Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	41¼	37	42½	38¼	42	31½	40½	31½
Silver Hill	2½	1⅞	1.70	1½	1.60	1¼	1¼	1¼
Silver King	8	7	7½	7	7¼	6⅞	6¾	6½
Silver Prize	....	....	15c	....	25c	20c	20c	....
Succor	15	10	15c	10c	15c	10c	15c	....
Summit	3	2.65	2¼	2.10	2.35	1.40	2.05	1⅞
Scorpion	2.10	2	2.10	1.70	1.80	1½	1.90	1½
Solid Silver	40c	25c	35c	20c	30c	20c	25c	....
South Bodie	40c	35c	40c	30c	30c	15c	25c	15c
South Standard	25c	20c	25c	20c	20c	15c	20c	15c
Star	50c	....	75c	50c	60c	45c	....	....
St. Louis	....	....	....	....	....	....	....	....
Syndicate	8¾	7½	8	7½	7	5	6	5½
Tioga Con	6⅝	4.90	5⅞	4.60	4⅛	3¼	4	3.10
Tiptop	1.10	1	80c	75c	90c	75c	1	75c
Trojan	25c	....	....	....	10c	5c	10c	5c
Union Con	39	32	38	36¼	37	29	35	26¼
Utah	19	15¾	18¼	17¼	17½	13½	16⅞	14
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.45	1⅛	1.40	1¼	1.40	1⅛	1.40	1.05
Wells-Fargo	....	....	....	....	....	....	....	....
Woodville	50c	30c	50c	40c	50c	40c	50c	35c
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	16⅞	14⅛	15½	14⅞	15	12¼	16⅛	14¼

Sales at S. F. Stock Exchange.

Friday A. M., July 25.
455 Alta...6¾@7
340 Alpha...20@19½
280 Andes...80@85c
85 Belcher...4
915 Bullion...5¼@5
230 Best & Belcher...16½@16¼
995 Benton...3.90@4.10
585 California...4.90@4.95
90 Con Virginia...4.65@4.60
140 Chollar...6
250 Caledonia...2
385 Crown Point...4.15@4¼
1320 Con Imperial...1.30@1⅜
80 Confidence...10½@10¼
175 Challenge...2.15
380 C Dorado...1⅞
655 Exchequer...5¼@5
100 Flowery...60c
280 Gould & Curry...8⅝@8½
115 Hale & Nor...12@11⅞
705 Julia...2.90@2.80
550 Justice...4@4.05
200 Kentuck...4
430 Lady Wash...1.20@1¼
100 Leviathan...40c
600 Lady Bryan...95c
685 Mexican...21@21½
150 Mackey...1¼
10 North Con Vir...9
600 New York...45c
50 N Bonanza...1½
150 Overman...8¼@8
775 Ophir...30⅞@31
355 Potosi...4¼@4.15
100 Solid Silver...25c
225 Silver Hill...1.15@1¼
485 Scorpion...1½
250 Savage...11
900 S Utah...5c
425 Sierra Nevada...34
35 Utah...14½
425 Union Con...26½@27¼
1040 Ward...1.15
515 Yellow Jacket...14¼
AFTERNOON SESSION.
1150 Argenta...1.20@1¼
250 Albion...30c
300 Aurora...50c
150 Adenda...40c
1480 Black Hawk...75c
925 Booker...80@85c
150 Belvidere...1
50 Bulwer...8⅞@9
330 Bodie...13⅞@14
265 Bechtel...1½@1.60
1980 Belle Isle...3.80@4
150 Belmont...30c
350 Champion...55@65c
100 Caledonia (B H)...2⅝
200 Crœsus...20c
15 D Standard...90c
50 Defiance...1.30
600 Day...20c
200 Dudley...1½
20 Eureka Con...14¾
30 Golden Terra...14
150 Goodshaw...40c
40 Glory...1.10
245 Grand Prize...3.70@3⅝
825 Gila...1¼@1½
100 Highbridge...20c
315 Independence...2
105 Jackson...3⅜
1110 Jupiter...2@2¼
1250 Leopard...1¼@1.40
10 Mammoth...11½
40 Mono...7¼
1000 May Belle...30c
100 Martin White...6@5⅞
240 McClinton...1
45 Mt Diablo...5
30 Manhattan...2½
240 Northern Belle...4¼@4.15
3400 N Belle Is...55c
250 Navajo...40c
1150 Orient...50@60c
200 Oriental...10@15c
100 Paradise...1.70
250 Queen Bee...65@70c
100 Raymond & Ely...4
350 Rustler...55c
240 Red Cloud...50c
145 Summit...1⅞
175 Silver King...6¾@6½
300 Syndicate...5¾@6
400 S Bulwer...70c
200 S Standard...20c
300 Silver Prize...20c
100 Tuscarora...10c
150 Tiptop...75c
1405 Tioga Con...3.90@3.80
200 University...50c
150 Vortex...75c
50 Wales...4⅞

Saturday A.M., July 26.
150 Adenda...40c
720 Andes...90c@1
110 Alpha...21½@22
545 Alta...7¼@7⅞
300 Albion...30c
250 Argenta...1½
140 Best & Belcher...17⅜@17¼
320 Belcher...4.30
1195 Benton...4.15@4½
450 Belmont...40c
20 Bullion...5⅝
1280 Belle Isle...4@3.90
3320 Bodie...13@11½
50 Bulwer...8⅞
240 Bechtel...1½
295 Booker...85@90c
125 Belvidere...1@95c
300 Black Hawk...80@90c
950 Champion...70@60c
115 Con Virginia...4.65
315 California...4.90@4.85
150 Chollar...6½@6⅝
1370 Con Imperial...1.40@1.35
385 Crown Point...4½@4.15
495 Caledonia...2.20
200 Challenge...2.15
300 C Dorado...1.80
180 C Pacific...7½@7¼
400 Caledonia (BH)...2½
100 DeFrees...15c
600 Day...20c
250 Dudley...1½
500 D Standard...1
70 Defiance...1.30
260 Exchequer...5¼@5⅝
325 Gould & Curry...9@9¼
350 Gila...1¼
350 Grand Prize...3.70
50 Glory...1.05
20 Golden Terra...14
500 H & Norcross...12⅞@13
100 Hussey...15c
100 Highbridge...20c
1270 Independence...1.90@1.95
285 Justice...4.20@4
185 Julia...2.95@2.90
1450 Jupiter...2
90 Kentuck...4½@4.10
460 L Bryan...1.30
95 L Wash...1.40
380 Leviathan...40@35c
895 Mexican...24@24¾
870 Mackey...1.30@1.35
100 Mt View...2.40@2½
500 Manhattan...2¼
720 Mt Diablo...5
160 Modoc...1
270 Mono...7@7¼
80 M White...5⅞@5½
800 N Belle Is...55@50c
625 N Bonanza...1.40@1.35
500 New York...50c
95 Ophir...32½@32¼
110 Overman...8¾@9
450 Oriental...40c
250 Orient...50@55c
234 Potosi...4.40
40 Phil Sheridan...45c
1110 Paradise...1.60@1.65
850 Queen Bee...75@70c
100 Real del Monte...3
100 Rustler...55c
440 Savage...11⅞@12
605 Sierra Nevada...37@36¾
100 Succor...15c
710 Silver Hill...1.30@1½
200 Solid Silver...25c
750 S Utah...10@5c
205 Scorpion...1.80@1.85
285 Syndicate...6
200 South Bodie...15c
250 Summit...1.80@2
400 S Standard...15c
50 S Bulwer...70c
895 Tioga Con...3.90@4
100 Trojan...10c
100 Tuscarora...10c
200 Utah...16@15⅞
905 Union Con...31@33
50 University...50@45c
200 Vortex...75c
165 Ward...1.15@1.20
385 Woodville...45@40c
810 Yellow Jacket...15⅞@16½

Monday A. M., July 28.
15 Alpha...20½
440 Alta...6¼@6⅜
420 Andes...1
740 Belcher...4.10
315 Best & Belcher...16½@16¼
375 Benton...3.90@3.85
340 Bullion...5@5¼
385 California...4.90@4.80
260 Con Virginia...4.70@4.65
760 Chollar...6¼@6⅝
1080 Con Imperial...1.30
410 Crown Point...4.30@4¼
350 C Dorado...1.80
155 Challenge...2¼@2.20
205 Exchequer...5¼@5
50 Flowery...45c
430 Gould & Curry...9@8⅞
60 Hale & Nor...12½
580 Julia...2⅞@2.80
130 Kentuck...4½
100 Lady Bryan...1
100 Leviathan...35c
255 Lady Wash...1.40@1.35
560 Mexican...22@22¼
650 Mackey...1.35@1.30
80 New York...45@40c
185 N Con Virginia...9
400 N Bonanza...1½@1.45
20 Overman...8⅝
600 Ophir...30¼@31
260 Potosi...4.40@4.35
20 Savage...11
315 Sierra Nevada...34½
200 Scorpion...1.80@1½
600 S Utah...5c
60 Silver Hill...1.40@1.30
200 Trojan...5c
1100 Union Con...30@28
200 Ward...1.10
165 Woodville...35@45c
740 Yellow Jacket...16@15¼
AFTERNOON SESSION.
950 Argenta...1.20@1¼
500 Adenda...35@30c
100 Albion...20c
615 Belle Isle...4.40@4.35
100 Belmont...30c
640 Booker...80@75c
155 Belvidere...95c@1
185 Bulwer...9@8⅝
1120 Black Hawk...95@90c
425 Bodie...11¼@11
210 Bechtel...1.55@1½
450 Champion...50@60c
100 Caledonia (B H)...2½
95 C Pacific...7@7¼
300 Crœsus...25c
200 Day...20c
250 Defiance...1.30@1.20
65 Eureka Con...15
1195 Gila...1.60@1¼
600 Grand Prize...3.70@3⅞
110 Goodshaw...40@35c
40 Glory...1.05
100 Hussey...15c
700 Highbridge...20c
1000 Independence...1.70@1.80
1080 Jupiter...2¼@2½
550 Leopard...1.30@1⅛
300 Leeds...75c
180 M White...5¼@5½
360 Mono...6¾
100 McClinton...1.05@1¼
20 Manhattan...2¼
10 Modoc...1
365 Mt Diablo...5
1350 N Belle Is...55@50c
30 Northern Belle...4¼
600 Oriental...40@45c
1250 Orient...50@40c
480 Paradise...1½@1.55
880 Queen Bee...75@65c
150 Richer...55c
100 Raymond & Ely...4
200 Real del Monte...3
190 Rustler...55@60c
250 S Bodie...25c
200 South Standard...15c
150 S Bulwer...70c
100 Silver King...6¼@6½
770 Syndicate...6@5¾
400 Summit...2.05@2
770 Tioga Con...3¼@3.55
300 Vortex...75c

Tuesday A. M., July 29.
150 Alpha...19½@19
330 Alta...6¼
225 Andes...95c@1
65 Best & Belcher...16
425 Bullion...4.90
590 Belcher...4@3.95
245 Benton...3.90@3.95
200 Con Dorado...1⅞
35 Confidence...10½@10¼
1070 California...4.85@4½
850 Con Virginia...4.60@4.65
310 Chollar...5⅞
50 Challenge...2.20
600 Con Imperial...1¼@1.15
530 Crown Point...4.05@4
145 Exchequer...5¼@5
100 Fairfax...1
500 Flowery...50c
320 Gould & Curry...8¼@8½
325 H & Norcross...10⅞
445 Justice...3.70@3.60
865 Julia...2⅞@2.65
210 Kentuck...4
250 L Bryan...1@1.05
500 Leviathan...30c
450 Lady Wash...1.20@1.35
345 Mexican...20¼@20⅞
150 Mackey...1.15@1.20
330 N Bonanza...1⅜@1.45
750 New York...40@45c
145 North Con Vir...9
630 Ophir...29½@30¼
90 Overman...8@8¼
100 Occidental...80c
10 Potosi...4.05
370 Silver Hill...1.20@1.15
175 Savage...10⅛@10¼
150 Scorpion...1.80@1¼
620 Sierra Nevada...31½@32¼
10 S Potosi...85c
300 S Utah...5@10c
50 Utah...14¼@14
610 Union Con...26½@27½
250 Woodville...40@45c
1950 Ward...1.05
630 Yellow Jacket...14¼@14⅞
AFTERNOON SESSION.
1495 Argenta...1.20@1.05
100 Albion...20c
525 Addenda...30@40c
295 Bodie...12@12½
290 Bechtel...1½@1.40
200 Belmont...30@35c
2125 Belle Isle...4@3.90
935 Booker...75@70c
230 Black Hawk...95c
125 Bulwer...8⅝@8½
10 Belvidere...95c
290 Champion...60@55c
190 C Pacific...7¼@7½
850 Caledonia (B H)...2½@3
650 Day...15c
315 Eureka Con...15@14⅞
555 Gila...1.30@1¼
230 Grand Prize...3.60@3¾
40 Glory...1.15
205 Goodshaw...25c
910 Golden Terra...13@13⅞
500 Highbridge...20c
655 Independence...1.10@2.15
620 Jupiter...2.40@2¼
50 Jackson...3⅞
500 Leopard...1.10@1
50 Manhattan...2
80 Martin White...5¼
150 McClinton...1.10@1
400 Modoc...1
255 Mono...6⅞
90 Mammoth...11½@11¼
25 Northern Belle...4.40
2200 N Belle Is...45@50c
400 Navajo...35c
200 Oriental...40c
2550 Orient...40@25c
150 Paradise...1.60
120 Raymond & Ely...4@3.90
100 Red Cloud...50c
250 S Bulwer...70@65c
270 Summit...2@1.90
300 S Bodie...15c
125 Syndicate...5½@5⅞
30 Silver King...6⅞
910 Tioga...3.40@3¾
400 University...40c
300 Vortex...70@75c
100 Wales...4¼

Wed'sday A.M., July 30.
40 Alpha...19¼
215 Alta...6¼@6⅜
250 Andes...85c@1
755 Benton...3.90@3⅞
245 Bullion...5
35 Belcher...3.95
205 Best & Belcher...16
1515 California...4.90@4.80
85 Confidence...10@10¼
760 Con Imperial...1.20@1.15
370 Crown Point...4.20@4½
835 Con Virginia...4.70@4.65
175 Chollar...6@5⅞
300 Con Dorado...1½
100 Challenge...2¼
270 Caledonia...2.10@2
435 Exchequer...5¼@5
60 Gould & Curry...8⅞@8½
750 Hale & Nor...11@11¼
535 Julia...2.55
155 Justice...3.90@3.85
300 Kossuth...10c
700 Leviathan...30@35c
805 Lady Wash...1.15@1.20
545 Lady Bryan...1
400 Mackey...1.15@1.20
100 Mountain View...2.40
285 Mexican...21½@21⅞
440 N Bonanza...1.40@1¼
110 North Con Vir...9⅛
450 New York...40c
405 Ophir...30½
50 Overman...8¼
100 Potosi...4.20
410 Savage...10⅞@10½
100 Solid Silver...25c
430 Silver Hill...1.15
425 Scorpion...1⅞@1.70
1625 Sierra Nevada...34@36
300 S Utah...5@10c
185 Utah...14¾@15
1230 Union Con...30@29
1520 Ward...1.05
460 Woodville...45c
205 Yellow Jacket...14¼@14⅞
AFTERNOON SESSION.
2110 Addenda...30@25c
2000 Argenta...1.10@1
200 Albion...25c
200 Belmont...30c
1025 Booker...60@50c
250 Black Hawk...95@85c
150 Bulwer...8½
10 Bodie...12
90 Bechtel...1¼@1.35
1475 Belle Isle...3⅞@3.85
615 Belvidere...1
410 Champion...50c
200 Caledonia (B H)...2½
200 Crœsus...20c
260 C Pacific...7¼@6⅞
20 D Standard...90c
400 Dudley...1.30
100 Defiance...1
30 Eureka Con...14⅝
520 Gila...1½
100 Grand Prize...3¾
400 Goodshaw...30c
100 Golden Terra...13
2265 Independence...2.10@2
765 Jupiter...2
200 Leopard...1
100 Leeds...75c
10 Martin White...5¼
230 Mono...7@6¾
200 McClinton...1
95 Manhattan...2
245 Mt Diablo...5
770 N Belle Is...35@30c
200 Oriental...35c
375 Orient...30@35c
20 Paradise...1.60
200 Queen Bee...65c
1000 Richer...50c
75 Raymond & E...4@3.90
50 Rustler...60c
100 S Bodie...20c
100 Summit...2
20 Syndicate...5⅞
700 S Bulwer...70c
200 Silver Prize...20c
25 Tuscarora...15c
300 Tiptop...1
540 Tioga Con...3.10@3¼
200 University...40c
70 Wales...4

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alta S M Co	Nevada	15	1 00	June 12	July 17	Aug 4	W H Watson	302 Montgomery st
Amazon Con M Co	Nevada	6	10	Mar 24	June 11	Aug 29	Jno Crockett	12 Cosmopolitan Hotel
Belcher S M Co	Nevada	19	1 00	July 21	Aug 26	Sept 16	Jno Crockett	203 Bush st
Belmont M Co	Nevada	21	30	July 1	Aug 7	Sept 2	J W Pew	310 Pine st
Belvidere M Co	California	4	25	July 9	Aug 11	Sept 6	C V Hubbard	203 Bush st
Booker Con G M Co	California	3	50	June 30	Aug 4	Aug 25	W H Lent	309 Montgomery st
Bullion M Co	Nevada	10	1 50	July 9	Aug 13	Sept 3	J Gruss	418 California st
Champion M Co	Nevada		25	July 26	Aug 31	Sep 30	G C Hurlhut	525 Commercial st
Commonwealth Con M Co	Nevada	1	25	June 27	July 11	Aug 30	C A Morse	217 Sansome st
Exchequer M Co	Nevada	14	1 50	July 9	Aug 15	Sept 5	J Gruss	418 California st
Gold Deposit G & S M Co	California	1	25	July 25	Aug 28	Sept 16	J M Buffington	209 California st
Goodshaw M Co	California	4	25	July 9	Aug 23	Sept 30	V Fernhach	327 Pine st
Gould & Curry S M Co	Nevada	36	1 00	July 10	Aug 14	Sept 3	Alfred K Durbrow	309 Montg'y st
Julia Con M Co	Nevada	9	1 25	July 8	Aug 13	Sept 4	H A Charles	419 California st
Jupiter M Co	California	4	25	July 5	Aug 11	Sept 4	E C Masten	22 Nevada Block
Leopard M Co	Nevada	11	50	June 11	July 15	Aug 5	J E Dixon	20 S F Stock Ex
Manhattan S M Co	Nevada	13	1 00	July 16	Aug 21	Sept 12	Jno Crockett	203 Bush st
McCrackin Con M Co	Arizona	3	25	July 29	Aug 29	Sept 17	H Aug Whiting	211 Sansome st
Mexican G & S M Co	Nevada	7	2 00	July 11	Aug 14	Sept 4	C L McCoy	203 Bush st
N Noonday M Co	California	2	25	June 5	July 14	Aug 18	G A Holden	310 Pine st
New York M Co	Nevada	19	40	July 8	Aug 9	Aug 29	D L Thomas	203 Bush st
Original Keystone S M Co	Nevada	2	25	July 28	Sept 1	Sept 28	F E Luty	330 Pine st
Real Del Monte M Co	Nevada	7	1 00	June 10	July 19	Aug 11	C V D Hubbard	203 Bush st
Savage M Co	Nevada	38	1 00	July 8	Aug 11	Aug 30	E B Holmes	309 Montgomery st
Sierra Nevada S M Co	Nevada	58	3 00	June 12	July 16	Aug 5	W W Stetson	309 Montgomery st
Silver Hill M Co	Nevada	7	50	July 10	Aug 14	Sept 4	W E Dean	203 Bush st
South Bodie G M Co	California	1	25	July 18	Aug 25	Sept 17	H Deas	309 Montgomery st
South Bulwer	California	4	15	July 16	Aug 20	Sept 12	Wm Stuart	320 Sansome st
Star M Co	Nevada	2	20	June 3	July 15	Aug 11	———	320 Sansome st
Tioga Con M Co	California	6	25	June 19	July 21	Aug 6	W H Lent	309 Montgomery st
Trojan M Co	Nevada	11	25	July 14	Aug 18	Sept 8	David Wilder	328 Montgomery st
University G M Co	California	2	10	June 9	July 14	Aug 4	W Letts Oliver	328 Montgomery st
Ward G & S M Co	Nevada	4	50	July 2	Aug 7	Aug 27	J Stadtfeldt, Jr	26 Haywards Build
William Penn	Nevada	5	05	July 12	Aug 13	Aug 30	O J Humphrey	328 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Addenda G & S M Co	California	1	20	July 2	Aug 7	Aug 28	T H Dixon	238 Montgomery st
Allison Ranch Ford G M Co	Cal	—	01	June 16	July 18	Aug 4	J E Carr	Grass Valley
Armand G & S M Co	California	1	10	June 9	July 28	Aug 25	J L Fields	240 Montgomery st
Black Hawk G M Co	California	6	50	July 1	Aug 4	Aug 25	H A Charles	21 Haywards Build
Crœsus G & S M Co	California	1	05	June 16	July 21	Aug 14	E Hestres	328 Montgomery st
Curtis Con M Co	Nevada	1	10	July 11	Aug 11	Aug 30	H S Stone	419 California st
Dudley M Co	California	4	25	June 12	July 16	Aug 11	E C Masten	22 Nevada Block
Emigrant S M Co	California	4	50	May 10	July 3	Aug 4	B W Mudge	309 Montgomery st
Fall Creek M Co	California	3	40	June 11	July 22	Aug 14	C Robinson	310 Pine st
Giant and Old Abe M Co	California	1	50	June 4	July 15	Aug 14	———	49 Nevada Block
Gover M & M Co	California	38	50	May 21	July 1	Aug 11	W O Wilson	402 Front st
Hartford S M Co	California	1	50	June 18	July 21	Aug 13	S Heringhi	422 Montgomery st
Ida M Co	——	1	25	June 19	July 21	Aug 6	———	324 Pine st
Leo M Co	Nevada	5	50	June 14	July 18	Aug 8	J J Scoville	59 Nevada Block
Mayflower Grav M Co	California	5	10	June 17	July 22	Aug 8	J Morizio	328 Montgomery st
Mono G M Co	California	4	50	June 21	July 28	Aug 18	W H Lent	309 Montgomery st
Numa M Co	Nevada	1	03	June 13	July 24	Aug 11	D Wilder	328 Montgomery st
Oriental Con G & S M Co	California	3	25	June 25	July 25	Aug 11	H C Hinman	411 California st
Queen Bee M Co	California	4	10	July 10	Aug 30	Sept 2	T A White	113 Leidesdorff st
Rustler G M Co	California	1	10	June 30	Aug 4	Aug 18	A F Main	309 California st
Seg Europa M Co	Nevada	1	25	Apr 4	July 31	Aug 18	R B Noyes	240 Montgomery st
Sherwood Con M Co	Nevada	1	25	July 12	Aug 12	Aug 30	H S Stone	419 California st
Swansea M Co	California	1	10	June 14	Aug 4	Aug 25	F N Delaney	315 California st
Wide Awake M & P Co	Arizona	7	02	June 23	Aug 1	Sept 1	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Calabasas L & M Co	Arizona	F A McGee	Merchants' Exchange	Annual	Aug 12
Comstock G & S M Co	Nevada	J M Buffington	309 California st	Annual	Aug 18
Crœsus G & S M Co		E Hestris	328 Montgomery st	Annual	Aug 18
DeHaro M Co	——	W W Bausman	409 California st	Annual	Aug 13
Europa M Co	Nevada	J L Fields	240 Montgomery st	Annual	Aug 14
George Douglass M Co		W W Bausman	409 California st	Annual	Aug 14
Independence M Co	Nevada	Jno E Dixon	327 Pine st	Annual	Aug 18
Julia Con M Co	Nevada	H A Charles	419 California st	Annual	Aug 13
Keystone S M Co	California	F E Luty	330 Pine st	Annual	Aug 6
McMillen S M Co	California	A O McMeans	Safe Deposit Build'g	Annual	Aug 6
Navajo M Co	Nevada	J E Dixon	Stock Exchange	Annual	Aug 12
Original Keystone S M Co	Nevada	F E Luty	330 Pine st	Annual	Aug 5
Rocky Point M Co	California	T L Bibbins	314 Bush st	Annual	Aug 18
S Comstock Con S M Co	Nevada	J M Buffington	309 California st	Annual	Aug 18
Seg Europa M Co	Nevada	J L Fields	240 Montgomery st	Annual	Aug 15
Sutro M Co	Nevada	A B Cathcart	327 Pine st	Annual	Aug 4
Tolo M Co	——	W W Bausman	409 California st	Annual	Aug 14
Vancouver M Co	——	W W Bausman	409 California st	Annual	Aug 13

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Argenta M Co	Nevada	J E Dixon	Stock Exchange	20	July 25
Belle Isle M Co	Nevada	John E Dixon	Stock Exchange	25	July 15
Bodie Con M Co	California	W H Lent	Nevada Block	1 00	Aug 1
California M Co	Nevada	C P Gordon	23 Nevada Block	60	June 17
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	60	June 16
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	1 00	July 21
Independence M Co	Nevada	John E Dixon	Stock Exchange	25	July 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	July 26
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	30	July 28

SALES OF LAST WEEK AND THIS COMPARED

Thursday A.M., July 24.
845 Alta...6¾@6⅞
310 Alpha...22@21½
300 Andes...80c
360 Belcher...4.15@4.20
545 Bullion...5¼@5½
240 Best & Belcher...17
645 Benton...4½
355 Crown Point...4½@4.30
20 Chollar...6⅞
260 Con Virginia...4.70@4¾
50 Confidence...11
200 Caledonia...2.10
490 California...4.80@4⅞
1510 Con Imperial...1.35@1.40
350 Challenge...2.20@2.10
400 C Dorado...1⅞
955 Exchequer...5¼@5⅜
700 Flowery...65@60c
390 Gould & Curry...8⅞@9
340 Hale & Nor...13
320 Justice...4¼@4.15
360 Julia...3.20@3.05
500 L Bryan...90c
200 Leviathan...40c
545 Lady Wash...1¼@1.15
590 Mexican...22½@23
110 Mackey...1.20@1¼
100 Mt View...2.30@2¼
610 New York...45@40c
100 N Bonanza...1.45
75 N Con Vir...9½@9
365 Ophir...32
215 Overman...8½@8⅜
250 Occidental...90c
160 Potosi...4½@4.40
80 Savage...12¼@12
565 Sierra Nevada...35@36
170 Silver Hill...1¼@1.20
50 S Utah...10c
200 S Potosi...85c
300 Solid Silver...25c
240 Scorpion...1½
1225 Trojan...10@5c
300 Union Con...29½@29
245 Utah...15½
610 Ward...1.15
455 Yellow Jacket...14⅞@14½
AFTERNOON SESSION.
150 Addenda...40c
145 Aurora T...50c
100 Albion...30c
900 Argenta...1.30@1.35
20 Belvidere...90c
130 Black Hawk...75c
210 Bulwer...8@8¼
400 Booker...90c
680 Bodie...14½@15⅞
300 Bechtel...1½@1.45
1565 Belle Isle...3¾@3.60
100 Caledonia (B H)...3
50 Crœsus...25c
160 C Pacific...7@6⅞
400 Champion...55c
200 DeFrees...20c
700 Dudley...1¼
300 Defiance...1¼
500 Day...15c
40 Glory...3.10
520 Goodshaw...40c
700 Gila...1¼
1115 Grand Prize...4
700 Independence...1.90@1.85
1295 Jupiter...1.95@2
400 Leopard...1.30
270 Mammoth...12@11½
630 Mono...8@7¼
300 McClinton...1@1.05
100 Mt Diablo...4½
390 Manhattan...2¼
365 Northern Belle...4@4.40
450 N Belle Is...55@50c
450 Navajo...40c
1770 Orient...50@45c
625 Paradise...1⅞@1.70
320 Queen Bee...65c
110 Raymond & Ely...3½@3.65
50 Richer...60c
180 Rustler...65@55c
600 Silver Prize...25c
50 S Bulwer...70c
360 S Bodie...15@20c
90 S Standard...15c
100 Syndicate...5⅞
400 Summit...2@1.90
505 Tioga Con...3.70@3⅞
550 University...50@45c
300 Vortex...60c

Thursd'y A.M., July 31.
130 Alpha...20@25½
395 Alta...6⅞@6⅝
650 Andes...90@95c
410 Belcher...3.95@4
475 Benton...4@3.95
340 Bullion...5⅞@5½
185 B & Belcher...16⅞@16½
260 Caledonia...2.05@2.10
90 California...4.80@4⅞
10 Con Virginia...4.60
80 Chollar...6½@6¼
130 Crown Point...4.40
1210 Con Imperial...1¼@1.30
160 Confidence...11@10⅞
285 Challenge...2½@2.40
250 Con Dorado...1.80
450 Exchequer...5½@5⅝
200 Flowery...50c
30 Gould & Curry...8¼@8⅞
505 Hale & Nor...12@12½
80 Justice...4
315 Julia...2.65
40 Kentuck...3.90
200 Kossuth...20c
830 Lady Bryan...1.10@1¼
675 Lady Wash...1.20@1¼
400 Leviathan...30c
1005 Mexican...22⅞@22
950 Mackey...1.15
210 North Con Vir...9⅛@9¼
440 N Bonanza...1.40@1.45
750 Ophir...32@32½
55 Overman...9@9¼
175 Occidental...90@85c
320 Potosi...4¼@4½
430 Savage...11
835 Sierra Nevada...39@40½
250 Silver Hill...1.20@1.15
100 S Utah...10c
140 Scorpion...1.90
100 Solid Silver...25c
95 Utah...16½@16⅞
1300 Union...35@33¼
640 Woodville...50c
425 Ward...1
515 Yellow Jacket...15½@15¼
AFTERNOON SESSION.
300 Albion...20c
175 Addenda...30@25c
1340 Argenta...1@90c
380 Bulwer...8½@8¾
920 Black Hawk...90@85c
80 Belvidere...1@95c
1435 Belle Isle...3.65@3.60
530 Bodie...12¼@12½
880 Bechtel...1¼@1.30
1715 Booker...1@1.10
200 Crœsus...20c
365 Con Pacific...6⅞@6½
1100 Caledonia (B H)...2½@2
675 Champion...50c
430 Dudley...1¼
155 Defiance...1
410 Grand Prize...3⅞@3.60
300 Goodshaw...35c
220 Golden Terra...12
1485 Gila...1½@1.30
100 Hillside...1½
615 Independence...2
870 Jupiter...2@1.95
100 Leopard...1
150 Leeds...75@70c
580 M White...5@4⅞
190 Mammoth...11
330 Mono...7¼
150 Mt Diablo...5@4¾
100 Modoc...1
680 McClinton...1.10@1
305 Manhattan...2@2¼
145 Northern Belle...4¼
200 Navajo...30c
950 N Belle Is...35c
250 Noonday...3½
400 N Noonday...2⅞
800 Orient...35@45c
500 Oriental...35c
390 Paradise...1¼@1.60
350 Queen Bee...65c
200 Red Cloud...45c
70 Raymond & E...3.90@3.80
40 Rustler...70c
300 Silver Prize...20c
335 S Bulwer...70c
50 Syndicate...5⅞
400 S Bodie...20c
90 Silver King...6⅞@6
25 Tiptop...65c
205 Tioga Con...3.10@3.20
250 Vortex...75@70c
140 Wales...4¼

Pacific Board—Latest Sales.

Wed'sday A.M., July 30.
10 Alpha...19½
50 Alta...6⅝
30 Best & Belcher...16½@16⅝
100 Belcher...4
120 Cameron...2¼@3
270 Con Virginia...4⅝@4.65
50 Crown Point...4.20
600 Con Imperial...1.20
150 California...4⅞
50 Chollar...6
50 Gould & Curry...8⅝
20 Hale & Nor...11⅞
40 Justice...3⅞@3.80
280 Mexican...22⅞@21⅞
10 Mono...7
140 Ophir...30½@31
30 Potosi...4¼
220 S Nevada...33½@36
100 Savage...10⅞
40 Silver Hill...1.20
10 Union...28½
100 Woodville...40c
100 Ward...1
20 Yellow Jacket...14⅞
AFTERNOON SESSION.
500 Andes...95c
20 Alta...6.70@6⅝

200 Bullion	5¼	30 North Con Vir	9
50 Benton	3	200 N Belle Is	45@50c
20 Bodie	12	50 Noonday	34
10 Best & Belcher	16½	200 New York	40c
150 Black Hawk	85c	100 Ophir Con	3½
65 Belcher	3.95@3.90	20 Overman	8½
25 Caledonia	2.05	150 Phil Sheridan	70c
10 Confidence	10	65 Silver Hill	1.20
60 Exchequer	5.15@5.20	10 Sierra Nevada	36
120 Gould & Curry	8½	100 Tioga	3½
100 Justice	3.80	200 Uncle Sam	1.60@1½
100 Lady Wash	1.20	30 Union Con	31½@31¾
100 Leopard	1.10	100 Ward	1
70 Mexican	22@22½	20 Yellow Jacket	14½
150 N Standard	2.40		

California Board—Latest Sales.

Wed'sday A.M., July 30.			
30 Alpha	20	30 Hale & Nor	11
70 Alta	6⅞@6¾	150 Julia	2.60
200 Atlas	10@12½c	30 Justice	3½
50 Atlta (N)	7½	100 Kossuth	15c
30 Belcher	3.90	50 Mexican	22@22½
40 Bullion	5@5.05	100 Mint	5c
300 Brilliant	15c	125 New York	40c
40 California	4.95	500 North Carson	1c
75 Con Virginia	4½	20 Ophir	30½@30¾
200 Con Imperial	1.20@1½	50 Potosi	4.50@4½
50 Crown Point	4.20@4.15	40 Savage	10½@10¼
40 Chollar	6@6½	20 Sierra Nevada	33½@33¾
40 Challenge	2½@2.20	700 S Utah	6@4c
65 Caledonia	2.10@2½	100 Senator	30c
300 Con Washoe	30c	20 Union Con	28½@28½
30 Exchequer	5	100 Wm Penn	10c
50 Gould & Curry	8½@8¼	260 Woodville	40c
		40 Yellow Jacket	14½

The Mining Share Market.

The general features of the share market for the past week has been from a panicky tendency to one of a better feeling. The mines themselves are in a sufficiently good condition to create a better market and more confident feeling, yet owing to the fear of Eastern stockholders, engendered by mistaken ideas propagated through the columns of a respectable Eastern journal, an unloading of stocks began which produced a heavy, gorged effect of the market. This suited the bears and all others who buy short on stock belonging to other people. Some of the brokers offered material aid to wrecking bears. This practice of loaning stocks seems to be very common among brokers, and it becomes a material question whether there is any safety to the owner of the stocks in permitting his stocks to be dahlled with in this manner by a wrecking fraternity. The still condition of the market during the past week, the continual depression of stock in valuable mines has its origin no where else than in the abuse of confidence displayed by this promiscuous manipulation of stock. If a broker loans his customers' stocks, his office should be tabooed at once. A tremendous power over the market is put into his hands, and a power which he does not scruple to use even against his customers' interests. Former panics have been caused by this nefarious practice, and public sentiment required its cessation, but the matter has assumed a gigantic size again, and as the same causes most generally produce the same effects, we may expect a panic more or less disastrous, unless the cause is removed by public sentiment, which even brokers respect. The indications point to a total lack of confidence, and after that will come the deluge. A certain quantity of improvement, however, now exists, and perhaps the better feeling arises from a return of common sense.

The Mechanics' Fair.

Meeting of Members and Appointment of Committees.

The Board of Managers of the Fourteenth Industrial Exhibition met and organized by electing the following officers: Irving M. Scott, President; D. A. McDonald, Vice-President; J. A. Bauer, Treasurer; J. H. Culver, Secretary.

The President appointed the following Committees: Auditing—Columbus Waterhouse, David Kerr, F. A. Frank. Building—James Drury, A. W. Starbird, David Kerr. Circulars and Classifications—Edw. McGrath, A. L. Fish, Nathaniel Hunter. Printing and Advertising—A. W. Starbird, David Kerr, James Drury. Power and Machinery—A. L. Fish, Samuel Dinsmore, S. H. Wheeler. Rules, Regulations and Awards—F. A. Frank, Nathaniel Hunter, J. A. Bauer. Tickets and Admissions—Nathaniel Hunter, F. A. Frank, David Kerr. Music and Decorations—J. A. Bauer, D. A. Macdonald, A. W. Starbird. Privileges—Samuel Dinsmore, James Drury, F. A. Frank. Locations—S. H. Wheeler, Samuel Dinsmore, F. A. Frank. Police—D. A. Macdonald, C. Waterhouse, Edward McGrath. Horticultural Gardens—J. J. Burns, C. Waterhouse, Samuel Dinsmore. Gas and Water—S. H. Wheeler, James Drury, D. A. Macdonald. Art—David Kerr, Edward McGrath, F. A. Frank.

A USEFUL PAMPHLET.—The Pacific Coast Postal Index, compiled by John P. Mains, and published by L. P. McCarty, 604 Commercial street, San Francisco, contains full information concerning postal regulations, rates of postage, and a complete directory of Pacific coast offices. Just the pamphlet needed by all.

MRS. VAN COTT will not preach the gospel for $3 per day. She lately returned $36 for 12 days' services, saying the amount was an insult to a widow.

OVER 3,000 acres of grass, near Fort Miller, Fresno county, were destroyed by fire last week.

A SEVERE shock of earthquake was felt at Watsonville on last Thursday evening.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

ALPINE.

ITEMS.—*Signal*, July 25: Mineral resources of this county are attracting attention. Several rich mines exist. The Colorado mine No. 2 is monthly turning out considerable bullion, which is shipped to Carson mint for coinage.

BUTTE.

ITEMS.—*Mercury*, July 25: The Buena Vista quartz mine is paying well. Jimmy Daney says they will put up five more stamps right away. Ned Rowe is boss of the mine, and reports a fine five-foot vein, and rich as that. The old '49 and '56 company will put up a mill next year, and prove that old Butte is the best quartz mining county in the State. McSmith passed here from his gravel mine and says it looks "O. K."

CALAVERAS.

EUREKA HYDRAULIC.—*Chronicle*, July 26: The claim is supplied with water from a ditch five or six miles in length with a capacity of about 500 inches, and deriving its supply from the Calaveras river, thus affording a good supply of free water throughout the season. From the time a fair supply of water could be obtained, work has been vigorously prosecuted day and night. A large force has been employed continually and a vast amount of gravel run through. From the ditch the water is conveyed to the claim, a distance of half a mile, across the river under which the pipe is securely laid, and bearing against the gravel bank with a pressure of 160 ft.

EL DORADO.

ITEMS.—*Democrat*, July 26: The last crosscut of the Kelsey mine showed the ledge to be 12 ft thick, the ore heavily laden with fine sulphurets, and giving assays of $26.20 to $38.70 per ton in gold, $6.55 to $14.00 in silver. In the Roseckranz mine, machinery is being placed and buildings erected.

MONO.

LAKE DISTRICT.—*Standard*, July 25: The Crescent folks are working night and day, driving a tunnel for the ledge. The rock has been hard, but now is getting softer, finding occasional bunches of quartz. The Silveropolis, one of the most promising locations on the east side of Mineral hill, has a shaft about 23 ft in good ground. They, also, are working night and day. We learn from a reliable source of an important strike of a fine body of ore in the crosscut of the Monte Christo mine. The ledge is 12 ft wide and is principally gold quartz.

BODIE MINE.—The middle winze is sunk at a point 80 ft north of the east crosscut, in the north drift. It follows the ledge to where water was struck, about 60 ft, all the way in the richest kind of ore, varying in width from one to three ft. At no point is it richer than in the face at the bottom, where free gold and native silver are seen in abundance. A pump has been put in, and a few feet sunk below the water line, but it is slow work. The ledge in the stopes south of the east crosscut, on the 433 level, is quite flat, the angle being not more than 25°, and the pitch being to the east and north. Ore has been stoped out about 40 ft south and as far up as the point where the ledge becomes perpendicular, a distance of perhaps 60 ft. The face of ore exposed along the south edge of these stopes is from 18 inches to two ft of very fine ore, in which free gold can be seen at any point. The same streak of quartz, several inches wide, dotted with pink spots and filled with coarse gold, which has always characterized this vein, can be seen all along the sides of this stope.

NOONDAY.—Bodie *News*, July 29: The north drift on the 300 level is now in 315 ft, and is being driven as rapidly as possible, with the view of connecting the Noonday mine with the joint shaft. The joint shaft is now down 190 ft, and is being sunk at the rate of five ft per day. When it reaches a depth of 212 ft, a drift will be run to connect with the north drift on the 200 level of the Noonday; the 212 level of the joint shaft being equal to the 198 or what is called the 200 level of the Noonday shaft. The Miners' mill is kept constantly at work on the Noonday ore.

STANDARD.—*News*, July 27: The north drift on the 385 level is in 293 ft. They are taking out about four ft of good ore on the footwall. The raise up 230 ft above the drift. During the week a crosscut was run through to the hanging wall, and it was found that the ledge at this point is 12 ft wide of fine ore. In the stope the ledge is about 10 ft wide. The upraise from the north drift on the 550 level is up 42 ft. The ledge here is eight ft wide and fine ore. In the West Standard slope the ledge is 10 ft wide, and of the usual rich ore. In the south drift of the 550 level, the ledge is seven ft wide and of good ore. In the stopes of the Gildea the ledge is three ft wide and looks well.

MARYLAND CON.—The incline is down 370 ft.

UNIVERSITY.—The new shaft has attained a depth of 30 ft. The ledge in bottom shows a solid width of three and a half ft of good ore, with indications of an increase in size as sinking progresses; alterations to suit machinery are all completed, and sinking already resumed.

JUPITER.—Shaft is now down 390 ft, and in the bottom shows a very strong and clearly defined vein of fair ore, which is widening rapidly as depth is attained. The south drift in the Masten vein is now in 130 ft, the ledge in the face being three ft wide of fair ore. The winze on the Daly vein is now down 85 ft, the ledge in the bottom being four ft wide of clean ore.

RED CLOUD.—The west crosscut, 400 level has been advanced during the week 15 ft. The face now in soft, red, rusty porphyry, mixed with clay. Several small feeders of ore have been cut, assaying $50 and upwards in gold.

TIOGA.—The winze on the 320 level is now down 120 ft. The ledge is five ft wide, of a good quality of ore.

SUMMIT.—North drift, 300 level, is in 186 ft; the ledge is three ft wide. The south drift, same level, has advanced during the week 26 ft; the ledge is two and a half ft wide.

GLORY.—The incline is in a ledge three and a half ft wide—bottom of very fine quartz.

MONO.—The joint drift on the 400 level, is in 330 ft, passing through favorable ground. On the 400 level, east drift, have cut four ft of fine-grade ore. Still in porphyry and vein matter, and expect within 40 ft to cut the rich Bodie vein.

SOUTH BELVIDERE.—Main shaft down 127 ft, bottom in lively quartz; ledge pitching to east.

BOSTON CON.—A strong ledge of good ore shows plainly all the way down the incline.

BOLWER.—The south drift, 380 level, is in 119 ft; the ledge is two and a half ft wide, and looking very well. During the week connection was made between the drift and the west crosscut from the 200 level of the Bodie mine. Rock still very hard.

VORTEX.—The ore vein is two and a half ft wide, all good ore, assays averaging over $100 in gold and silver.

S. NOONDAY.—In the north drift the ledge is 18 inches wide, of good ore. In the south drift the ledge is 12 inches wide, of good milling ore.

S. BULWER.—The ledge is three and a half ft wide of good ore.

NEVADA.

ITEM.—*Transcript*, July 25: Shoecraft & Sprague, of the Nevada City (formerly Schmidt) mine have, since taking possession, sunk their incline to a depth of 150 ft, where they commenced to run a crosscut. Within the past two or three days the crosscut has developed a ledge 18 inches thick. The ledge matter is composed of about 80% of very fine sulphurets. ft runs north and south, and pitches to the east at an angle of about 30°.

ORLEANS FLAT.—The tunnel of the Moston & Davis ledge at Orleans Flat is now in a distance of 320 ft, giving 180 ft backs. The ledge is three ft thick and rich in fine sulphurets and free gold. A crushing of ore will soon be ready. Assays show that it goes $63.56 per ton.

ITEMS.—Grass Valley *Union*, July 26: A clean-up of 60 tons of tribute rock from the Alaska mine, a few days ago, yielded $1,685, or over $28 per ton. The machinery for commencing operations on the El Capitan mine, south end Providence lode, has been shipped from New York, and will arrive here in two or three weeks. It consists of engine, boilers and hoisting works. At the new shaft of the Rocky Bar mine good milling rock is being raised to the surface, and a crushing of 80 loads of rock therefrom is now going through Sothern's mill.

GODFREY MINING TUNNEL.—*Union*, July 27: Arrangements having been perfected for the running of a tunnel from the Deer creek side of the ridge into Alta hill, through Weed's ranch, the Godfrey mining company have had a survey made and started a bedrock tunnel. The tunnel has been started at a point low enough to drain the gravel channel in the Weed ranch and also the ground of the Godfrey gravel claim. It is expected that gravel will be struck in a distance of 200 ft, although to reach the working of the Godfrey claim 1,000 ft will have to be run.

PLUMAS.

ITEMS.—*National*, July 26: Immense quantities of black sand containing platinum can be saved from the mines. A new five-stamp quartz mill is to be put up on a ledge opened by Thompson Bros. at Argentine.

SIERRA.

ITEMS.—Downieville *Messenger*, July 26: Most of the mining claims in this section have cleaned up, with returns much greater than were expected early in the Spring.

TUOLUMNE.

TIOGA.—*Democrat*, July 26: Several parcels of ore from the new mines in Tioga district were sent here this week to parties interested. Some of it resembles in appearance the ore of Bodie. Silver mountain, on which the most prominent mines are situated, is about one mile northwest Mount Dana. Active operations have been commenced on the Lake, Ahwaga, Revan, High Rock and Atherton. The Ahwaga shaft is down 15 ft in depth, showing fine ore from the surface. Assays from the bottom of the shaft went $205.13. At the depth of 50 ft, a crosscut will be run to ascertain the width of the lode. The shaft in the Lake mine was down 14 ft, and the vein runs from 35 to 40 ft in width; it may go to 50 ft, as they have not found the full width. The rock assays rich, specimens of which can be seen at Adam Haag's store. The ledge has been traced for several miles. Some 30 claims are already located, each 1,500 ft in length.

TULARE.

GENERAL ITEMS.—Miners are prospecting for placer gold on King's river, Tulare county, at the mouth of Sycamore creek, in the vicinity of old "Sycamore gulch diggings," with fair results. Years ago these rich claims were worked out, so far as practicable, but the volume of water in the river prevented further development.

NEVADA.

WASHOE DISTRICT.

UNION CON.—Gold Hill *News*, July 30: On the 1600 level the drift east toward the Union shaft is making a foot and a half per day, through soft ground carrying some water and streaks of clay; total length from the north lateral drift, 134 ft.

OPHIR.—The north drift, 2300 level, is averaging three ft per day through vein matter showing streaks of quartz; total length, 42 ft. The joint Mexican winze from the 2100 level is now down 20 ft and cutting blasting porphyry.

BELCHER.—The mine is cooling off since the connection north with the Crown Point on the 2700 level.

JUSTICE.—Crosscut No. 1 west, 1500 level, is nearing the ore channel rapidly. The formation strengthens as it is penetrated.

ALTA.—The crosscut in Benton ground, 140 ft north of the incline, is in 40 ft and is cutting a very fine formation of vein material carrying bunches and stringers of ore. On the 1550 level, the drift north, along the vein in Lady Washington ground, still cuts stringers of clay and bunches of low-grade ore. In a day or two ore will be regularly stoped from the 1450 up to the 1350 level, and the mill will be kept in constant operation.

CALIFORNIA.—The joint west crosscut, 850 level, is adding an average of five ft per day to its length, and is cutting blasting porphyry. On the 1950 level a winze from the north end of the ore stopes has been started on down, and has passed through ore of low grade to a depth of 16 ft. A crosscut is about to be started west on the 2150 level, and will be run to a point under the north ore body, as developed on the 1750 level, to explore the ground there.

CON. VIRGINIA.—Last evening 12 bars of bullion were shipped, aggregating $47,373.07. The west joint crosscut on the 850 level is being rapidly advanced through hard porphyry; total, 523 ft. On the 1500 level, and from the face of the drift running west of the old stopes, a raise has been started, which is now up 18 ft, and shows ore of low grade.

SAVAGE.—The 2100 level has been drained and the water is being gradually lowered toward the 2200 level. The large pumps are throwing their full measure of water into the Sutro tunnel, and two donkey pumps are employed in sending water to the Combination shaft, where it is raised to the tunnel level and discharged. The south winze from the 2100 to the 2200 level is being repaired to aid in ventilating the 2200 level when it is reached.

JULIA CON.—The flow of hot water recently encountered in the face of the crosscut, 2000 level, has greatly decreased and is now easily handled by the pumps.

SIERRA NEVADA.—The air currents which were disarranged by the connection with the Union shaft on the 2000 level are becoming somewhat settled, and ventilation on the disturbed levels is improving gradually.

YELLOW JACKET.—Last Monday evening the sills for the 2700 station were laid in the new shaft.

OVERMAN.—The east crosscut from the north lateral drift, 1600 level, is making rapid progress through vein porphyry. The south vertical winze from this level has reached a depth of 303 ft, and a sump is being made.

EXCHEQUER.—The air pipes for blowers and compressed air are all ready for use, but the heat has hindered operations.

LADY BRYAN.—The drifts north and south, on the 600 level, are looking well, particularly that south, in which some rich streaks of black sulphuret ore have lately been encountered. The crosscuts east from these two drifts are cutting some fine-looking quartz. The crosscut west, 750 level, is in hard rock. The east, same level, is finding some promising quartz, but as yet of low grade.

CON. IMPERIAL.—The north drift, 2600 level, is making an average of four ft per day, and is now in 524 ft, the face in hard porphyry, with stringers of quartz which assay fairly.

HALE & NORCROSS.—Water stands 22 ft below the 2100 level.

TROJAN.—The northeast drift, third level, is passing through quartz and porphyry. The raise from the east crosscut, same level, is also in quartz and porphyry, the quartz assaying very well. The workings on the second level are in porphyry; total length of west drift, 85 ft.

SUTRO TUNNEL.—The heat prevents work in the south branch at present. A corps of workmen are engaged in placing the sub-drain in where the boxes were raised for temporary use.

WARD.—The shaft has reached a depth of 1,575 ft and is encountering a heavy flow of water. The bottom is cutting a formation of bird's-eye porphyry.

BULLION.—The winze has now attained a depth of 65 ft on the slope below the 2150 level, the bottom in a mixture of clay and porphyry.

LEVIATHAN.—A little more quartz is coming in. Around in the face of the north lateral drift is hard blasting porphyry.

GOULD & CURRY.—Sinking the joint shaft is slow, on account of the heavy flow of water. The work of putting in the foundation for the pumping engine has been commenced and is making favorable progress.

NORTH BONANZA AND FLOWERY.—The north and south drifts, 400 level, are making good progress along the vein, and sinking is going on as usual. The north drift, 300 level, is in vein matter carrying stringers and bunches of ore.

VIRGINIA.—*Enterprise*, July 25: The late connection with the Union shaft, on the 2000 level, was an event of great importance to all the mines lying to the northward of the C and C shaft. The drift which thus connected with the shaft is 2,500 ft in length, of extra hight and width. It is the channel through which flows an immense current of pure and cool air—a great life-giving river pouring along 2,000 ft below the surface of the earth. It creates a new surface, as regards air, at the great depth of 2,000 ft below the surface of the earth proper. The air, which was hot and terribly foul when the connection was first made, is now as pure as that which sweeps over the surface of the earth.

BELMONT DISTRICT.

BELMONT.—*Courier*, July 26: The raise from 300 level was advanced since last report 14 ft in a fine vein of quartz, averaging four ft in thickness and from eight to twelve inches of good milling ore. In our 200 south level there is opening up a nice body of high-grade chloride ore 100 ft south of shaft and 40 ft above the level. Drift running north under the vein from crosscut in 400 level was advanced 16 ft. The drift south has been started on the vein from the long crosscut in 400 level and finds the quartz very soft, and carrying a strong trace of mineral.

ALEXANDER.—There is a vast amount of ore in sight, enough to keep the mill running for years to come. The bullion shipments from this mine are regular and leave a handsome margin for profit after paying all working and other expenses.

ESMERALDA DISTRICT.

RICH STRIKE.—*Herald*, July 26: A rich and valuable discovery has been made inside the limits of Esmeralda mining district, which, when made public, will surprise the most sanguine, and open the eyes of those who have always known it was there. The find consists of a gold ledge, as near as can be ascertained about 10 ft in width, and as far as discovered 1,000 ft and more in length. It is what is called a blind ledge; and is equal in richness to the best find in Bodie, or the glittering chambers of Del Monte.

ARIZONA.

GLOBE.—*Silver Belt*, July 25: Work on the La Plata is being pushed; the vein matter is looking better as developed. Brewster is working his mine, the Dundee, which is situated on the west end of the Basin. It shows a very good vein of chloride and horn silver. The Mack Morris mine produces rich ore. Ore is now being taken from the new shaft on the west end of the claim, which assays from $3 to $40 per pound. Dr. Thatcher, at the depth of 95 ft in the shaft of the S. W. Alice mine, came into an ore body of black spar. Many pieces of the rock are covered with beautiful crystals of horn silver. The vein is well defined and is increasing rapidly in size.

ITEMS.—Prescott *Miner*, July 25: Eighteen bars of base bullion from the Agua Fria smelter came in this morning to F. W. Blake, belonging to the Peck mining company, weighing 1,561 pounds. This bullion has been made by Mr. Syme at the Agua Fria from galena ores found in the Peck mine, which contained too much lead to mill closely. Rich placer discoveries have lately been made on Lynx creek, Walker district, and claims there pay $10 per day to the hand.

TUCSON ITEMS.—From Clifton, Des Cabezas, Chiricahuas and Swisshelm districts come reports of extensive and rich mineral deposits. At Des Cabezas, and southward to Bowie, the ledges are large and very rich. One vein bearing gold is continuously located for nine miles. It lies between perpendicular slate walls, and the "Bear Cave" claim of 1,500 ft is one containing gold in every place where pieces have been broken off. There are gravel beds along the Fresco river which are from 10 to 150 ft deep, and all the dirt will pay. A number of miners are taking out $20 per day to the hand. In the same neighborhood are numerous large veins of quartz-bearing gold.

MARICOPA.—Phœnix *Herald*, July 19: In the Tonto district the Mazatzal company's mill will resume crushing as soon as the rain falls in sufficient quantity to supply it with water. Al Seiber & Co. have sunk 50 ft on their Bonanza, and find the ledge carrying considerable quantities of free gold. The House and Rouse mines are looking extremely well, the main ledge having been found in the tunnel which cuts it at a depth of about 125 ft. The Maukins & Stroud mine is being gradually developed as the weather permits. Every indication of permanency is to be seen in this mine. The ledge is about eight ft in width.

COLORADO.

SILVER CLIFF.—*Prospector*, July 25: A few days ago the miners on the Wolftown lode struck a three-inch streak of sulphurets which runs very high. A new find has been made six miles east of town. The float on the ground assayed 300 ounces. A "blow-out" has been found east of the city four miles in the foothills, which shows up extremely fine-looking quartz. The lode has been named the Sunset. A large strike was made in gray copper and silver. A very handsome piece of gold-bearing rock was found near the surface yesterday, six miles east of town, by Francis Fransue near the saw mill.

ITEMS.—Georgetown *Miner*, July 19: In Baker gulch, Rabit-ear range, some party struck, near the grass roots, ore consisting of solid ruby and lead, assaying as high as 17,000 ounces per ton. Parties leasing on the Rogers lode, Democrat mountain, have, after working nine months on lean ground, struck it rich. We saw a specimen yesterday filled with native silver. Specimen assays from 1,100 to 3,000 ounces. Mill runs 810 ounces per ton. A new strike is said to have been made at Geneva gulch. It assays over 3,000 ounces, is nearly two ft in width and has good walls. The ore is sulphuret of bismuth. The prospects about Geneva are first-rate.

SILVER CLIF.—Denver *Tribune*, July 23: On the Powhattan a true fissure vein was uncovered, the mineral at grass roots assaying from $30 to $51 per ton. A tunnel has been run into the mountain 65 ft, which with 40 ft more dead work, will cut the vein 78 ft below the surface. The Domingo also has a true fissure vein, which at a depth of 25 ft shows argentiferous galena and gray copper, carrying from 71 to 310 ounces silver, and 3,410 ounces gold. The Wanderer, another new strike near the Ben Franklin, has a large body of mineral at a distance of 50 ft, which runs 200 ounces silver. On the Denver lode, adjoining the Lone Star and Gray Eagle, where Captain De LaMar's diamond drill is now at work, it is reported that mineral carrying about four ounces gold has been found. The Round Mountain tunnel company are working two shafts, and the Iron Mountain company are pushing their way into the hill with three shifts of men, still on drift No. 1, which is now in 75 ft from foot of shaft. The Rambler, Lone Star, Humboldt, Abandoned, Lady Franklin, Rocky Mountain, New El Dorado, Leavenworth, Zebra and Wild Cat are all working two or three shifts surfacing ore, and the output is more than satisfactory. From the last named the owners have on their dump about 100 tons of mineral, for which they are offered $80 per ton, and as yet their shaft is down but 70 ft. The Buckeye company are now working 30 men on the King of the Valley and Gray Eagle. Drift No. 4 on the former is showing handsomely in sulphurets, and ore that is being sacked from the latter runs about 000 ounces.

CUSTER COUNTY.—*Prospector*, July 24: The Mississippi lode has struck a rich deposit of carbonates. The Rocky Mountain lode, adjoining the above named, is showing some very rich truck. The Crow Bait lode, an extension of the Lady Franklin, belonging to Thomas Jackson, William Saunders and William Craig, at a depth of seven ft gives an assay of 22 ounces in silver and 8% copper. The Lady Franklin lodo is growing richer as it goes down. There are now 10 tons of ore on the dump ready for the mill, which will average 175 ounces, while the shaft shows

[CONTINUED ON PAGE 76.]

Notes on the Fishes of the Pacific Coast.—No. 1.

At the last meeting of the California Academy of Sciences a paper was read by W. N. Lockington on new and rare fishes of the Pacific coast. We shall print these notes in sections as space will allow.

I have lately been occupied in studying the flat-fishes or Pleuronectidæ of this coast. Since the date of my last paper on the subject, I have been fortunate enough to find another new species, and also to verify the occurrence in our markets of a species of a halibut (*Hippoglossus*), which is probably identical with the European species. It will be as well, therefore, to commence the present paper by recording some additional information respecting this group of fishes. Prof. Theo. Gill, of the Smithsonian Institute, writing in 1864, enumerates 16 species of Pleuronectidæ from the Pacific coast of North America. Not that Prof. Gill had seen all these species; the list was a literary enumeration of species described by various authors. Among them were two species described by the old Russian naturalist, Pallas, and inhabiting the seas between Kamtchatka and North America. These two species have not yet been, with certainty, identified, and, as descriptions of that date were very short, giving but few characters of the animal described, it is not unlikely that one or both of them may be identical with species now known under other names. Two of the species enumerated were characterized by Dr. Gunther, of the British Museum; two or three by Dr. W. O. Ayres, formerly of this city, and one by Prof. Gill himself. Most of the others had been described by Girard in the "Pac. Rail. Rep.," vol. X.; but one of these, the common flounder, with rough scales and striped fins, had been proved by Dr. Gunther to have been first noticed by Pallas. In the following year, Prof. Gill added another species to the list, making 17 in all. I am thus particular in giving the number because I wish to prove to you this evening how it is that, although I have found three new forms, the distinctness of which I could prove in five minutes to the satisfaction of any person who would take the trouble to look at them, I am yet in a position to confidently assert that the distinct species yet known on this coast are *fewer* than 17, the number to be found in Prof. Gill's memoirs. Let us begin by leaving out the two unidentified and perhaps more northern forms described by Pallas, and the northern *Pleuronectes glacialis*, of Richardson. We ought then to have 14 species upon this part of the coast, without counting the three I have lately found. But there are really only ten species, excluding the three just found. It may not be amiss to show how these "nominal" species were made, especially as in so doing it will be made evident that the most learned and acute men, working from a few specimens preserved in alcohol, or, worse still, dried or skinned, may fall into errors which those who describe from quite fresh specimens are not likely to fall into. Girard's descriptions were incomplete and too often taken from young, immature specimens, or from a single specimen. From this insufficiency of the descriptions of Girard it came about that Gunther and Gill, from specimens forwarded to them, redescribed the same fishes that were described by Girard as so many new species, not recognizing the identity of their specimens with Girard's.

One of our common flounders was thus made into three species, for one of which Dr. Gunther is responsible, for the other, Prof. Gill. The latter authority doubted the former's species, but added another, describing it in terms which are but a better description than Girard's, of Girard's species. Our "Turbot" was so indistinctly characterized by Girard that when Dr. Gunther received several specimens of it, he thought it another species, and placed it in another genus. Prof. Gill doubted the distinctness of the two, but in the absence of material, could not prove their identity. These errors were all of a nature which no naturalist, unless he have before him a series of fresh specimens, can avoid falling into; but so much cannot be said for another of Gill's species, founded on a sun-dried specimen of a flounder sent him by Dr. J. G. Cooper, from San Diego. The description of this fish, a very full and complete one, most unmistakably applies to a form very common in our markets, and first described, but incompletely, by Girard. The character on which Prof. Gill's new species and genus were founded are simply those due to the rough way in which the fish was preserved, and I cannot but wonder that Prof. Gill did not perceive the identity of his specimen with Girard's species.

Again, I have lately been able to prove that one of the species described by Dr. Ayres, viz: *Hippoglossus californicus*, the California or Monterey halibut, is identical with a species previously described by Girard. Girard's name, *Paralichthys maculosus*, has precedence of Ayres' name, and must be retained as the scientific name of the species.

I will now give a few notes upon the species of Pleuronectidæ not mentioned in my last paper.

Hippoglossus vulgaris.—A true halibut, very nearly related to, and possibly identical with, the halibut of the Atlantic, is occasionally brought to this market, but as yet I have only seen one specimen, or rather part of one, since the central portion had been sold away before I saw it. Its rarity may be inferred from its price, which was 50 cents per pound, but I am told that as the season advances it may probably become more abundant. The first to bring the occurrence of this fish on our coast to the notice of naturalists was our Dr. Ayres. (Proc. Cal. Ac. Sci., vol. 1, p 40, 1855). "Another species, in which the eyes are on the right side, is occasionally taken near the Farallones, opposite the mouth of the bay, which I do not feel warranted in separating from *H. vulgaris*, without direct comparison." Fin-rays, D. 102, H. 73, p. 16, v. 6.

Dr. Ayres, though he suspects the identity of this fish with the European form, does not prove it; and as this point has never been proved, I am most anxious to procure a specimen for this Museum, so that it can be examined at leisure, and its characters compared with the European form.

The only notes I could take were as follows: Eyes far apart, the distance between them equelling or exceeding their longitudinal diameter; teeth numerous, in a double row along both sides of both jaws, with some irregular teeth not in the exact line of the rows, but between them; branchios tegals (the bones supporting the gill-membrane) seven in number. About twenty caudal rays, the principal ones several times bifucate, posterior margin nearly straight.

The specimen weighed between 40 and 50 pounds, but this fish attains a far greater size and weight. It is said to be common upon the more northern parts of our coast, also on the coast of British Columbia and Vancouver's island.

Note.—Since writing the above, I have been informed that Prof. B. Goode, of the Smithsonian Institute, says that the Alaska halibut is identical with the European form.

About June 12th, a schooner load of this species, brought, packed in ice, from Vancouver's island, for once glutted the market with halibut. One of these fishes that I measured was 5 feet 11 inches in total length, and one weighed 220 pounds.

Glyptocephalus zachirus. Nov. sp.—This species is remarkable for the great length of the pectoral fin of the right or colored side of the body. This fin is longer than the head and about equal to one-fourth of the total length of the fish, but only the central rays are thus lengthened, the others decreasing rapidly on each side. This long pectoral, together with the blunt shape of the front part of the head, sufficiently distinguish it from its congener, *G. pacificus*, and from all our other flat-fishes. It is of a uniform grayish color, formed by black points on a brownish round. The blind side is beset with dark points on a white ground, as is the case with *G. pacificus*. The first of the season were in the market March 21st, and since then it has been of tolerably regular occurrence, but not abundant. It does not appear to be taken in the Bay. The largest I have seen was a little more then 14½ inches long, but only 4¼ deep, so that, for a flat-fish, it is very slender. In flavor it excels most of the other Pleuronectidæ of this locality.

The species of *Glyptocephalus* mentioned in my last paper (*G. pacificus*) has not been of uncommon occurrence during the last few weeks among the heaps of small flat fishes exposed for sale in the Clay-street market. The largest I have yet seen measured only 11½ inches in length, and I am rather inclined to think that it does not attain much larger dimensions. In flavor I believe this fish to be inferior to its congener.

The curious "Bastard Turbot," as the dealers call it (*Pleuronichthys cœnosus*), has been rather common lately. It is believed by many of the dealers to be, as the name they give it imports, a cross between a turbot and some other species; but of course this idea is inadmissible.

Leaving the Pleuronectidæ, I will now give a few notes upon other species.

Stereolepis gigas, Ayres, Jew Fish.—This large species was supposed by its describer to be seldom found to the northward of Point Conception, which is about 40 miles west of Santa Barbara.

The individuals upon which his description was founded were taken in San Francisco bay, but their rarity here, together with the fact that many other southern species appear to make that point their northern limit, induced him to consider as stragglers, all specimens taken to the north of it.

It appears, however, that the Jew fish, though not very common, is regularly taken in the neighborhood of Monterey and Santa Cruz, so that Monterey bay must be included it its normal range. During the present summer I have seen three small specimens (about two feet long) which were taken in Monterey bay. These individuals give no idea of the size attained by the species. The two caught in our bay weighed, as stated by Dr. Ayres, 187 and 360 pounds, and measured 5 feet 8 inches and 7 feet in length respectively; Messrs. Spence and Johnson received last year from Monterey an individual weighing 412 pounds; and one as large, or even larger, was sold in Clay Street market. Mr. Johnson and the dealer in Clay-Street market both assure me that the fish is excellent when cooked; yet buyers do not appear to take to it, on account of its decided ugliness. It is stated to be of sluggish habits, and to live in deep water hidden among the rocks.

This fish belongs to the *Serranidæ* or marine *Percidæ*. It is a stout, deep fish, its greatest depth equal to nearly a third of its total length; the head is large, equal to a quarter of the total length; and there are two dorsal fins, the first large with nine stout spines; the second shorter but rather higher with three spines and eight soft rays. The scales are small; and the teeth very numerous and small.

Anoplopoma fimbria (Pallas), Ayres, Candle-fish.—This species is very rare in the markets of San Francisco, but appears to have been more abundant this year than at any previous period.

Dr. W. O. Ayres (Proc. Cal. Acad., 1859) states that in his time stragglers only occurred in the markets; and the fish-mongers call it a "new" fish, and declare they have never seen it before. Dr. Ayres gives the number of rays in the first dorsal as 23, but I can only find 21 in the specimens I have examined. Probably the number varies slightly. The outline figure in the Proc. Cal. Ac. vol. 1, 1859, shows 22. The tail is much more deeply emarginate than is shown in the figure, as the central rays are only about half as long as the outer ones. Most of the individuals brought to the markets are not over ten inches in length, but Dr. Ayres states that he saw one that measured eighteen inches. A specimen procured in May for the Cal. Acad. Sci. measures twelve inches in length. The fishermen call this species candle-fish, but whether on account of its oiliness, of its length and slenderness, or of a fancied resemblance to the species called candle-fish in Oregon and northward I cannot tell. The last-named candle-fish (*Ammodytes personatus*, Grd.) is not at all nearly related to the present species; it is so oily that it is said that the Indians make their candles by pulling their yarn through its flesh. Between October and May *A. fimbria* did not occur in the markets, but it is not unlikely that the severe weather which prevented the fishermen from trawling was the cause of this.

This species was described by Dr. Ayres (Proc. Cal. Ac. Sci., 11, 27, 1859) under the name of *Anoplopoma merlangus;* but Dr. Steindachner identifies it with a species described by the old Russian naturalist, Pallas. In color it is plain greenish brown, becoming lighter beneath; the fins colored like the body. Traces of lighter blotches may be observed on the sides of some fresh specimens. The body is long and slender; the scales small and ciliated; the teeth small and numerous; and there are *two* dorsals, distinct and remote from each other, a character by which it may readily be known from the other Chiroids. Dr. Ayres was puzzled to tell whether its affinities were with Percidæ, Chiridæ or even with the Gadoid or cod-fish tribe, to which it has a general resemblance. Dr. Gill, however, classes, it with the Chiroids.

Probably San Francisco lies very near the southern limit of the range of this species, which becomes more abundant northwards, and is found along the northern coast of Eastern Asiatic Russia.

Chitonotus megacephalus, Nov. sp.—Three individuals of this species are all that I have as yet seen, and one of these was picked out from a heap of prawns (*Pandalus danæ*), crustaceans which are trawled from rather deep water. I conjecture that its rarity may be accounted for by its habitat and by its small size, which does not tempt the fishermen to procure it. Those which come to market are accidentally taken while trawling for prawns. It is a very singular little fish. The head is immense in comparison with the rest of the fish, occupying nearly a third of the total length, tail-fin included; and the mouth is half as long as the head. The eyes, close together on the top of the head, are very large, nearly one-third of the length of the head, and between one-tenth and one-eleventh of the total length of the fish. The first or spinous dorsal is divided into two portions, the first containing three, the second ten spines. The first spine is almost as long as the head, but the third is shorter than the anterior spines of the second portion of the spinous dorsal. But the greatest peculiarity of the fish is in the scales, which are entirely confined to the upper part of the body, leaving the lower undefended. Each scale is ctenoid or spinous on its posterior margin, and along the lateral line runs a row of larger scales set with spines on both their upper and hinder margins. The head has sundry spines by way of defence, the largest being a compound four-pointed affair on the upper angle of the preoperculum. The total length of the fish is about five inches, its color olivaceous, becoming whitish below.

Caulolatilus princeps.—This has been one of the most puzzling of the marine fishes of this coast, and the puzzle, which consists in ascertaining whether there are one or two, or three species of the genus *Caulolatilus* on the Pacific coast, is not yet solved. *C. princeps* was first described by Jenyns, an English naturalist, from the Galapagos islands, a little south of the equator, and opposite the coast of Peru.

In the Pro. Cal. Ac. Sci., vol. III., Dr. Cooper described, under the name of *Dekaya anomala*, a species which was afterwards ascertained by Prof. Gill to belong to his genus *Caulolatilus*. Dr. Cooper's specimen was from Santa Catalina island, where the species is known as "White-fish." Finally, Prof. Gill described a *C. affinis*, from a small specimen (three feet long) obtained at Cape St. Lucas. The examples described under these various names differed considerably in shape, fin-rays and color, and the localities, as will be seen, were so far apart that, as the examples did not agree, it was natural to suppose them separate species. We have lately obtained two individuals in the markets of San Francisco, both probably brought from near Monterey; one is an adult, 17¾ inches long, the other, half-grown, and 10 inches long. The first is very deep in front, owing to the development of fat upon the back of the head and anterior dorsal region; thus approaching Jenyns' form; while the second resembles Cooper's specimen, and has a black spot above the pectoral fins, as in Gill's *affinis*. The difference between these two specimens, both from the same locality, and that a locality from which the fish has not previously been recorded, leads me to believe it probable that there is in the Pacific only one species of the genus *Caulolatilus*, with a known range extending from the Galapagos to near San Francisco, and probably a further extension southward. This is the only species of its family that occurs on this part of the coast. The scales are ctenoid, as in the perch tribe, but very small; the preoperculum set with small teeth on its edge; and the dorsal and anal fine very long, the soft portion of the former much more developed than the spinous portion.

Platinum.

The inquiries of Mr. Edison concerning platinum have excited a desire for investigation that can only be satisfied by supplying the demand, if demand exists. We say if the demand exists, because it is not at all certain that a market for platinum would justify the practical abandonment of hydraulicing for gold. If the devisibility of the electric light should be practically demonstrated and that light take its place among the utilities of present civilization, then perhaps a sufficient demand would be created to develop our platinum deposits. Heretofore miners have paid no attention to this metal, allowing it to go to waste in quantities together with the osmium and iridium, with which it is associated. All of our hydraulic mines could save a certain quantity of platinum, as that species of mining is generally confined to cement beds and alluvial deposits where platinum abounds. It is found in large quantities in the black sand, known to every hydraulic miner, and exists in small thin scales. The platinum product of the world hardly exceeds, at the present time, 1,000 pounds per annum, and commands a comparatively low price—probably not more than $2 per ounce—hence the lack of desire to mine for platinum and abandon so precious a metal as gold. The expense of mining it would be about the same as gold, the demand, though very large, would not entice many from the yellow metal. Upon the northern coast of California a mixture of gold and platinum metals, in extremely small scales, is washed from the beach sand and separated by amalgamation, platinum and mercury not having any affinity. It is also found like gold in alluvial deposits, in rounded grains or nuggets, nearly always associated with osmium and iridium. Observations of the rocks and minerals found with platinum in deposits lead to the belief that it is chiefly derived from the disintegration of serpentine rock. Chromic iron is a common associate. It is also found in syenite. It has never been found in regular veins in quartz. If Mr. Edison can show that quantities of platinum are needed, it will pay the hydraulic miners to save it for him, which they can easily do to the full extent of the demand.

Relations of Fusion to Molecular Oscillation.—R. Pictet supposes that the temperature may be represented by the length of the calorific oscillation of the molecules of a body, and from this hypothesis he deduces the two following laws: 1. The higher the melting point of a solid the shorter are the molecular oscillations. 2. The products of the temperatures of fusion by the lengths of oscillation are constant for all solids. The laws are confirmed by all the metals of which the coefficients of dilation have been determined with sufficient accuracy. Similar relations hold good for the elements of volatile liquids, when they are compared at their boiling points. These laws may be classed with the law of constancy between the products of atomic weights and specific heats.—*Comptes Rendus.*

Palmetto Fiber for Paper.—The Fernandina (Fla.) *Mirror* reports that the machinery, lately brought to that place by Prof. Loomis, for the preparation of palmetto fiber ie working satisfactorily, and that the experiment is an assured success. The stalks of the scrub palmetto are used. It is said that the fiber is likely to prove useful for cordage, paper, tubs, pails, flour barrels, boats, powder kegs, and no end of other articles of general use. A portion of the fiber shipped to paper mills is intended for the manufacture of high-grade paper to be used by the Canadian Government in the printing of bank notes. Ultimately, it is said, the various grades of paper fiber will be made into pulp in Florida.

The Mississippi Jetties Finished. — Capt. J. B. Eads reports, under date of July 10th, that the greatest depth and width of channel required by the Jetty Act at the mouth, and also at the head of South Pass, has been secured. The completion of the great work was certified to the Secretary of War the same day by Capt. M. R. Brown, of the United States Engineers, inspector of the work. The jetty channel is over 30 feet deep, and a good navagable channel of 26 feet, measured at the lowest stage of the river, exists at the head of the passes. The benefits to commerce likely to flow from this brilliant achievement are inestimable.

THE ENGINEER.

The New York and Brooklyn Bridge.

At a meeting of the Trustees of the New York and Brooklyn bridge, July 7th, the contract for supplying the steel and iron for the suspended superstructure, was awarded to the Edgemoor Iron Co. The contract calls for 10,728,000 pounds of steel and 34,000 pounds of iron. The bid of the Edgemoor Iron Co. was 4 35-100 cents a pound, amounting to $468,147. Chief Engineer Roebling said that when the change from iron to steel was first contemplated he supposed that the difference in price would be at least $100,000, but in fact the lowest bid for steel exceeded by only $4,000 the accepted bid for iron last year. The difference between the lowest bid and the lowest bid for crucible steel was $364,000.

Both towers of the bridge have been completed, the last work on the Brooklyn tower having been finished July 5th. Mr. Kingsley expressed the belief that through this contract it would be possible to complete the bridge by January 1st, 1881. The financial condition of the bridge on June 30th was as follows: Total receipts, $10,623,492.94; total expenditures, $10,523,574.85; outstanding liabilities, $112,807.62.

ROCKING PIERS FOR VIADUCTS.—A novel construction has been employed in the Dysdale viaduct on the railroad from Christiana and Fredrikshald, carrying a single rail over the Dyse rivulet in Norway, in the shape of rocking piers, the object of which is to protect the structure from the effects of expansion and contraction due to alterations of temperature. The piers which support the superstructure are of wrought-iron with a lattice-work web. In the longitudinal direction of the viaduct, which is 603 feet in length, there is only a single column between each span, possessing no stability in itself, and the upper end of this column is allowed to move along with the superstructure when the later expands and contracts. The lower end of each pier rests on a hinged shoe, so that breaking strains are avoided, and the load is always rendered central to the pier columns. The movement of the iron-work in a longitudinal direction is transferred to the one abutment, on which are the necessary bed-plates provided with rollers; on the other abutment the superstructure is kept in place by a fixed shoe. With this arrangement no special expansion-joint in the rails is necessary, as the sleepers and platforms are quite independent of the expansion and contraction of the ironwork.

HIGHWAY CROSSINGS.—The question of highway crossings over railroads at grade is getting to be a serious one in many of the suburban towns about New York, and particular attention has been called to it just now by the killing of a wealthy old gentleman by a train on the Harlem road at Morrisania, a short time ago. *Punch* once said that it would be necessary to kill a bishop in order to call attention to some dangers of railroad travel, but in this case a millionaire will probably be sufficient. Already the papers are full of letters and editorials on the subject, and all sorts of suggestions are made for a remedy. Within 15 miles of New York there are many towns and large villages with a considerable traffic on their streets, and all of them have grade crossings at points where trains are frequent and the danger great. There is generally a strong objection to gates at crossings on account of the delay caused by them, but it is a question whether people will not have to submit to that, as the risks now run are too great to be endured much longer.—*Railroad Gazette.*

BRIDGE GUARDS.—The New York, Lake Erie & Western Company is putting up guards at all its overhead bridges, to warn brakemen of their approach. The guards are made by putting up, some 300 feet from the bridge, posts on each side of the track, to which cross-pieces are attached, from which hang a number of pieces of rope so that, no matter which way a brakeman is looking, if he is standing so that his head will strike the bridge, the harmless contact with the dangling rope ends will warn him of his danger in time to avoid it. The New York Central, we believe, uses a similar device. The Pennsylvania and some other companies use a slender rod hinged to a post at the side of the track, with a spring to keep it up to its place. This will strike a brakeman a sharp rap, and swing back to its place when he is past.

A FEAT IN ENGINEERING.—Owing to the immense weight that they sustain, the iron shoes in which rest two of the spans of the railroad bridge at Easton, Pa., lately sunk about an inch, throwing the bridge out of grade. As it was certain that the depression would continue, from the fact that the inside masonry of the pier is less solid than the outside, an iron casting, weighing 7,000 pounds, was recently successfully placed under the spans, in order to elevate them. The spans weigh 180 tons each. Hydraulic jacks were used. The spans were raised, the masonry redressed, the castings placed in position, and the spans lowered without the stoppage of a single train.

THE Aztlan quartz mill, 10 stamps, six miles south of Prescott, Arizona, was totally destroyed by fire on the night of the 18th inst. Supposed to be the work of an incendiary. Loss, $12,000.

USEFUL INFORMATION.

Distinguishing Butter from Lard, Beef Fats, etc.

Mr. William Gustavus Crook, public analyst for Norwich, England, describes a method which will in a few minutes distinguish butter from the fat of beef, mutton, or pork, or mixtures of them.

The sample to be examined (if in the form of butter) must be first melted and rendered pretty free from water and salt, by filtration if necessary; 10 grains are then to be put into a test tube and liquified by placing the tube in hot water at about 150° Fah.; remove the tube when ready, and add 30 minims of carbolic acid (Calvert's No. 2 acid, in crystals, one pound; distilled water, two fluid ounces). Shake the mixture, and again place it in the water bath until it is transparent. Set the tube aside for a time. If the sample thus treated be pure butter, a perfect solution will be the result; if beef, mutton, or pork fat, the mixture will resolve itself into two solutions of different densities, with a clear line of demarkation; the denser of the two solutions, if beef fat, will occupy about 49.7%; lard, 49.6%; mutton, 44% of the entire volume; when sufficiently cooled, more or less deposit will be observed in the uppermost solution. If olive oil be thus tested, the substratum will occupy about 50%; with castor oil, there is no separation. With some solid fats (not likely to be used fraudulently) no separation whatever takes place; the addition of a minute portion of alkanet root will render the reading of the scale extremely distinct by artificial light. The author states that the above method (although not intended to surpass other processes) is capable of wide application, the saving of a large amount of time, and the reliability of its results will at once recommend it as a "first step" in butter analysis.

CEMENT FLOORS FOR CELLARS.—For making floors, the following method is said to produce very desirable results: Four parts coarse gravel, or broken stone and sand, and one part each of lime and cement, are mixed in a shallow box, and well shoveled over from end to end. The sand, gravel and cement are mixed together dry. The lime is slaked separately and mixed with just mortar enough to cement it well together. Six or eight inches of the mixture is then put on the bottom, and when well set another coating is put on, consisting of one part cement and two of sand. This will answer for making the bottom of a cistern that is to be cemented up directly upon the ground without a lining of bricks. This will also form a very good cellar floor. A cement of one part sand, two parts ashes and three parts clay, mixed with oil, makes a very hard and durable substance like stone, and is said to resist the weather almost like marble.

LIGHTNING RODS NOT INSULATED.—Insulators should not be used in putting up lightning rods on buildings for protection against the electric current. The rod should be fastened directly against the building. But the most important precaution is to make sure that the bottom end of the rod has a large conducting surface in contact with the earth. Better have no rod than simply to stick the end a few feet down into dry earth; the proper way is to solder the bottom end of the rod to a metal water pipe or gas pipe in the ground. If there are no pipes, then make a long trench and put in some good conducting material, such as fine charcoal, or hard coal dust, iron ore, or old iron, making a good connection between the bottom end of the rod and this conducting material.

THE USE OF FILES.—A new file should always be used with a light pressure until the very thin sharp edges of the teeth are worn off, after which a heavier pressure may be used with less danger of the teeth crumbling at the top or breaking off at the base. Every filer should keep a partially worn file to use first on the chilled or gritty skin of castings, or on a weld where borax or similar fluxes have been employed, or on the glazed surface of saws after gumming. In filing high tempered steel it will generally be found more profitable to use the finer grades of files, called 2d cut and particularly where anything like a fine finish is required.

MUSIC OF THE FLUTE.—That it is really the air which is the sounding body in a flute or other wind instrument, appears from the fact, that the materials, thickness, or other peculiarities of the pipe, are of no consequence. A pipe of paper, and one of lead, glass or wood, provided the dimensions be the same, will produce, under similar circumstances, exactly the same tone as to *pitch*. If the *qualities* of the tones produced by different pipes differ, this is to be attributed to the friction of the air within them, setting in feeble vibration their own proper materials.—*Sir John Herschel.*

RAILROAD CURVES.—When a train of cars is rounding a curve the greater weight is on the outside rail. The centrifugal force of the train round a curve tends to overturn the cars upon the outer rail, as the center of gravity of the mass is some distance above the top of the rail.

VENTILATION BY THE CHIMNEY.—A parlor-fire will consume in 12 hours 40 pounds of coal, the combustion rendering 42,000 gallons of air unfit to support life. Not only is that large amount of deleterious product carried away and rendered innocuous by the chimney, but five times that quantity of air is carried up by the draft, and ventilation thus effectually maintained. The ascent of smoke up a chimney depends on the comparative lightness of the column of air within to that of an equal column without; the longer the chimney, the stronger will be the draft, if the fire be sufficiently great to heat the air; but if the chimney be so long that the air is cooled as it approaches the top, the draft is diminished.—*Faraday.*

MAGNESIUM STEEL.—Magnesium also causes a remarkable change of structure in other metals. A coarse-grained steel becomes fine-grained on the addition of one-fifth per cent. of magnesium. In performing the experiments referred to, the magnesium must be introduced through a hole in the cover of the crucible after the oxygen has been first removed by the addition of a few pieces of charcoal. Without this precaution violent explosions are apt to occur.—*Ber. d. Chem. Gesell.*

TO HARDEN THE SKIN.—The constant use of the fingers in practicing the violin, piano and guitar, or kindred instruments, frequently becomes very tender and sore. The skin may be hardened by applying a strong solution of alum in water, or the tincture of white oak bark. A still better lotion would be a solution of tannic acid. Any drug store can furnish the acid, which should be dissolved in water.

INSOLUBLE CEMENT FOR BOTTLES.—Soften glue in cold water and melt it in the water bath to form a very thick paste. To this add good glycerine in quantity equal to the dry glue taken, and continue the heating to expel as much of the water as possible. This may be cast on a marble slab to cool, and melted for use as required. This is not soluble in alcoholic liquids.

LIGHTNING ARRESTER FOR TELEPHONES.—Surround the wire for a distance of three or four inches with a copper tube having a number of internally projecting points, which come very near the wire but do not touch it so as to interfere with its vibrations. The copper tube should be connected with a ground wire having good ground connections.

GOOD HEALTH.

Labor as a Form of Athletic Exercise.

Open-air labor is the most effective cosmetic, an almost infallible panacea against all kinds of bodily deformity. But the remedial virtue of labor, *i. e.*, sound bodily exercise, is greater than that of open-air life *per se;* for among the rustic population of Scandinavia, Scotland, and Northern Germany, who perform a large portion of their hard work in-doors, we frequently find models of health and vigor; far more frequently than among the inhabitants of Italy, Spain, etc., who pass the greater part of their indolent lives in the open air.

But besides all this, athletic exercises have a moral value, which our social reformers have strangely failed to recognize; they afford a diversion and a vent to those animal energies which otherwise are sure to explode in debauch and all kinds of vicious excesses. The sympathetic thrill by which the mind accompanies a daring gymnastic feat, and the enthusiasm of athletic contests, form the most salutary, and perhaps the only normal gratification of that love of excitement which is either the legitimate manifestation of a healthy instinct, or else a wholly irremediable disease of our nature. The soul needs emotions as the body needs exercise, and the exciting sports of the palæstra met both wants at once. We try to suppress these instincts, but their motives remain, and if thwarted in their normal manifestations they assert themselves in some abnormal way, chemically instead of mechanically, as Dr. Boerhaave would say, by convulsing the organs of digestion, since the organs of motion are kept in unbearable inactivity. In times of scarcity the paupers of China and Siam silence the clamors of their hungry children by dosing them with opium; and for analogous reasons millions of our fellow-citizens seek relief in alcohol; they want to benumb a feeling which they cannot satisfy in a healthier way.

After finishing his day's work the Grecian mechanic went to the gymnasium, the Roman to the amphitheater, and the modern European and American goes to the next "saloon," to satisfy by different methods the same instinct—a longing for a diversion from the dull sameness of business routine. There is no question which method was the best—the only question is which of the two had substitutes may be the worse: the brutalizing, *i. e.*, soul-hardening spectacles of bloodshed of the Roman arena, or the soul-destroying poisons of the liquor shops?—*Dr. F. L. Oswald, in Popular Science Monthly.*

The Fur on the Tongue.

The nature of the fur on the tongue has been the subject of a study by Henry T. Butlin, F. R. C. S., and the results of his investigation are given in a paper read at a recent meeting of the Royal Society. The author finds that tongue fur consists chiefly of (1) debris of food and bubbles of mucus and saliva, (2) epithelium, (3) masses which at first appear to consist of granular matter, but which are the glœa of certain forms of schistomycetous fungi. In order to ascertain the true nature of the glœa, and to obtain it in a purer form, it was cultivated upon a warm stage. Several fungi were discovered, but only two of these were present in every instance, *Micrococcus* and *Bacillus subtilis*, and as the glœa produced artificially was similar to that existing naturally in the tongue fur, it is believed the fur is composed essentially of these two fungi.

Micrococcus developed freely and abundantly, forming large masses of yellow or brownish yellow color. *Bacillus* did not develop, but existed in greater or less abundance in all the cases examined. It appeared to be identical with the *Leptothrix buccalis* described by Robin. Although it did not develop under artificial conditions, it is probable that development takes place freely upon the surface of the tongue. Its habitual occurrence there, and the presence of spore-bearing filaments, favor this view. Besides these fungi there were present in more or less abundance, *Bacterium termo*, *Sarcina ventriculi*, *Spirochæta plicatilis*, and a larger form of *Spirillum* or *Vibrio*. The first of these fungi existed in some of the furs, and twice developed with great rapidity. The second was frequently present, and generally developed quickly, forming large masses of a yellow or yellowish brown color. The *Spirochæta* occurred in only two or three of the specimens examined.

The slime between and around the teeth was found to consist of the same fungi as the tongue fur, but the rods of *Bacillus* were longer, probably owing to fewer disturbances.

THE SIGNIFICANCE OF SALT IN WELL-WATER. In Prof. Lattimore's report on the analysis of well-water, which was proved to be the cause of a serious epidemic of typhoid fever in Rochester, he lays special stress on the significance of the presence of common salt in well-water in general. No single indication, he holds, is of so great sanitary importance in judging of the purity or impurity, and consequently of the safety or danger, of any water. He proceeds then to show that, though from the universal diffusion of this substance in the air and in the soil, we should expect to find it in all waters, whether from rain, springs or wells, because of its extreme solubility, nevertheless, he argues, the quantity of salt that should be found normally from the causes named in well-water is extremely small, and therefore, whenever "it rises above a very few grains per gallon, it becomes certain that it comes from some other source than the soil;" and he concludes with the logical inference that, as nearly all the salt used for domestic purposes escapes by the way of two channels, the water-closet and the house-drain, we should therefore expect, "what is always found on examination to be true, that, whatever sewage may or may not contain, it always contains salt." A fuller abstract of this portion of Prof. Lattimore's report will be found in the *Popular Science Monthly* for July.

MUCOUS MEMBRANES.—Dr. Rollin R. Grigg says there is no one medicine that can cure all cases of irritated and abraded mucous membranes and stop the waste of albumen. A variety of remedies is required to do this, in the different cases, and the treatment must be governed to a great extent by the peculiarities of constitution, and by the condition and the symptoms of each patient at the time the case is taken in hand. Furthermore, this is a diseased condition, where every case should be under the care of an educated, judicious physician, as much as severe cases of typhoid fever, diphtheria, or any of the other most intricate diseases. I will say, however, for the encouragement of all, on this now almost hopeless subject, that there is a series of most reliable physiological facts bearing directly upon the curability of all cases in the first stages, and which shows that of all tissues the mucous membranes are the most quickly and easily healed of any by proper treatment.

DIETETIC MEDICINE.—A subscriber sends us the following, which he says has restored many to health who had despaired of medical treatment, in cases of debility and blood-poisoning. Put the white part of a raw, freshly laid egg into a tumbler, add a wine-glass of pure, soft, cold water, which has been boiled. Drink this ten minutes before each meal. Perhaps, also, food containing albumen largely could be added to this. Distilled water or boiled water only—the principle involved being the destruction of germs which exist in the natural water, and may be thence transferred into the system.

ORGANIC RESISTANCE TO A BOILING TEMPERATURE.—Ch. Chamberland has found a microscopic organism which lives in nearly all liquid solutions of organic matter, provided that they have been previously neutralized by a solution of potash. It produces germs or spores which, when placed in neutral media, resist a boiling temperature for several hours. A temperature of about 115° (239° Fahr.) kills them very rapidly.—*Comptes Rendus.*

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The Week.

Since our last issue the stock business has passed safely through a great variety of hazardous situations. Beginning with the sudden influx of stock held in the East, the indications pointed strongly to a panic. The action taken by Eastern journals in uttering the sayings of some innocent hear that seeks only his own advantage in being interviewed by an equally innocent interviewer, fully illustrates the tender condition of the public conscience in regard to stock speculations, and the ease with which a scare is created, causing the unloading of great quantities of particular stock—but "that's the way we make our money" in the stock business.

That the market rallied is due to the innate common sense of stock investors generally, who being on the ground here in person or through trustworthy agents, understand the real condition of our mines, and the object of the *accidental* interviews with scientific sharps. There is not and never can be a feeling of perfect confidence in this stock business, and hence it is not surprising that the condition may be said to have been "nervous" during the week.

The trouble lies with the bears. Old bears, young bears and even cubs are hard at work. As fast as one family of bears is chained up a new variety appears, and then the "wreckers" are again on the tapis manipulating with the stock of others or loaned for the occasion. There must be both bulling and bearing, but their need not be operations on borrowed stocks. Shorting stocks in this manner is a two-edged sword, and those who loan their stocks for this purpose will have cause to regret. Let stocks be bought for a rise, that is business, and legitimate, but demoralization is caused by loaning stock to illegitimately influence the market.

Failing to Deal with all the Factors.

There is a class of economists who, when studying the question of the profitableness of gold and silver mining on this coast, have a habit of considering only the amount of assessments levied, and the dividends disbursed on account of this industry, and, pointing to the excess of the latter, claim a balance in its favor. This showing is well enough so far as it goes, but it scarcely exhibits the true state of the case. These figures fail to reach bottom facts. In their way of treating the subject these statisticians overlook a great deal that ought to be considered. They fail to deal with all the factors in the case. They leave out items of expenditure and elements of loss that should appear in the reckoning, for if a business is to be credited with its successes and its profits, it should be debited with all attendant outlays and failures. The imperfections of such methods of measuring the value of this industry is made apparent by the very compilations upon which these writers depend for their facts.

For example, the California mine on the Comstock is credited in these assessment and dividend tables with more than $30,000,000 net earnings, with not a cent for assessments charged against it. In the case of the Consolidated Virginia, over $40,000,000 in dividends are off-set by less than half a million contributed in assessments, and yet several millions must have been expended in the purchase, development and equipment of these properties.

But these are insignificant items compared with the labor and money that have been expended upon other mines lying along and adjacent to the Comstock lode, none of which have ever figured on the list of assessments collected or imposed. And these Comstock outlays of which no record has been kept, shrink in turn to almost nothing beside the enormous disbursements equally profitless and alike unrecorded made elsewhere on mining account. These things, belonging happily now to the past, are not here recalled with a view to disparaging this branch of mining. But being a pursuit that can afford to stand on its merits it is only fair that these off-sets should be charged up against it.

A slight inspection of the class of statistics under consideration will serve to disclose how little light they are capable of shedding on this business of mining for the precious metals, viewed in all its aspects and bearings. They are useful so far as they go—lucid enough but so little enlightening that not much more of exact and appreciative knowledge does the inquirer possess after than before consulting them. These tables tell us that Comstock shareholders for $55,000,000 paid in assessments have received in return $117,000,000 in dividends—net earnings $62,000,000 in excess of outlays. The California mines, Bodie being left out, have, we are assured, absorbed a million and a half in the shape of assessments and returned just twice as much in dividends. Bodie mine owners have paid out one million and got back two. Other shareholders in properties scattered all over the mining regions have spent $10,000,000 in assessments and received $13,000,000 in dividends; all of which on the face of it and at first sight looks well enough, seeing shareholders, besides these large gains, still own the mines.

But these figures fail to represent the vast amounts of money and labor expended on properties of little or no value, nor do they inform us how much more those dividend-earning shares cost the holders than was ever reimbursed to them. By these figures the California mine is made to appear self-sustaining from the first—as a property that never required the aid of assessments, whereas purchasers of that stock really paid enormous assessments in the shape of high prices for their shares. In these tables the mines of this State, which have produced a billion in gold, are burlesqued through the statement that they have been assessed one million and a half and divided five millions.

Verily these are explanations that themselves need explaining, not that it is important we should be able to cypher out the sum total of these assessments and dividends to a fraction. Our people have seen fit to assess themselves to the extent of many millions in the furtherance of this industry, and that without saying much about it. And there have been other dividends than those that figure in connection with stock operations. They consist of the earnings that have been distributed among the working classes and small capitalists throughout a period of thirty years, nurturing mining, aiding other callings and sustaining the very framework of society.

But these statisticians love to busy their heads with figures, and theorists have a penchant for the ideal, and something may be pardoned to these infirmities. Practical mining is, however, a thoroughly realistic sort of pursuit. It is a bundle of actualities. In dealing with it we know where we are and what we are about. Language has here a determinate meaning and figures a fixed value. But when we enter the speculative realms of the business, all is changed. Things are not what they seem. Facts become fictions and figures lie; and so we miscalculate and all are misled.

We should aim to be honest if we cannot always be exact in figuring on mining. It is a business that calls for no concealments and requires that no false lights be held out to allure investments. Backed by its two billion production it needs no apologies. It has made its mistakes and brought losses to many. But it is worth all it has cost, and it is doubtful if any other industry of equal importance has been matured in shorter time or with fewer sacrifices. It took a hundred years to place cotton planting on as good a footing as mining occupies to-day, though a much more simple business in itself. Mining for the precious metals is a complicated and difficult pursuit, and we have need for all the reliable information easily obtainable upon it. But these tabular statements, though often a convenience, enlighten us but little on its inner history—throw but a faint light on its lower levels.

The Mechanics' Fair.

Exhibitions are commercial safety valves. The heavy load of secrecy occasioned by the desire of business men to overreach each other and obtain reciprocal remunerative advantages, finds ease and comfort in fairs and industrial displays. The progress made in the privacy of workshops are here made known to the public. If these means were not taken to show and be shown, business would become stagnant, and valuable exhibits remain in obscurity, a loss to their originators. The creation of a new demand is effected by the display of an object, suitable to that new demand. A mere advertisement, although possessing a certain amount of publicity, acquires an immense power when coupled with the methodical arrangement of a public exhibition, in bringing before the public notice the particular points of novelty and utility, as regards mechanical contrivances and economical features in relation to agricultural productions. Like wine and tobacco, exhibitions have numerous opponents, but are in large and ever-increasing demand. They have made the tour of the world, and are now at the Antipodes. They have an incentive in the deep interest manufacturers and merchants feel, in bringing their industrial products before the people. Local interests unite with national interests, and combined, form a power which excites the inventive genius of outsids and foreign competition.

What is true in general is true in particular, as well in logic as in human affairs, and he who would deride a public exhibition of the kind now proposed should first intimate a more available plan for promoting intercommercial competition. All of the industries in this city may be visited and examined. Goods may be priced and objects to suit the most fastidious taste may be selected. But the probability is that in such a vast emporium, scattered over so many miles of streets and byways, many things more suitable, and of more utility to the average demand, would be overlooked. Hence the requirement of concentration in some certain public locality, where the eye can, at a glance, take in the various objects presented to its view.

The system of local and national exhibitions has become thoroughly established, in fact the local is a stepping-stone to the national or universal, and to decry or neglect these now necessary adjuncts to commercial activity is equivalent to attempting business without capital, store room or advertisement. It is always unpleasant to speak in a complaining key, but it appears to us that a more general interest could be infused into our own local Mechanics' fair. A few days and the fair will open. Will it be a success? The producer alone can, by his actions or omissions, answer the query, Yes, or No. Yes, to his credit morally and pecuniarily. No, to his detriment politically and financially.

PACIFIC COAST PRODUCTS AT THE MECHANICS' FAIR.—Mr. W. H. Murray, Business Manager of the San Francisco *Journal of Commerce*, has been requested by the managers of the Mechanics' Institute fair to secure a display of California products for exhibition. The displays made by this gentleman with the aid of producers in former years, have attracted much attention, and given visitors a much better idea of the quality and variety of California products than they could otherwise have obtained. This year it is hoped a much better and larger display will be obtained, and all producers are requested to contribute material which they regard worthy of exhibition. A circular has been issued which announces that the display will consist of cereals, wine, wool, minerals, ores, tobacco, silk, flour, woods, and other objects, natural or cultivated, of curiosity or importance. A special feature of this exhibit will be a magnificent display of tropical and semi-tropical fruits and fruit-bearing trees, raised in California. All who are able to furnish anything worthy of display in any of the above lines are requested to ship per Wells, Fargo & Co., who will deliver them to the Mechanics' fair building, Mission and Eighth streets, S. F. All matter should be way billed "S. C." Credit will be given to each party contributing to the exhibition, and all are requested to be particular in giving name of grower, and place where grown.

A STEAM tramway from Rome to Tivoli was recently opened with a large popular demonstration. Tivoli, it will be remembered, is where the finest Pinafore ship ever put upon any stage, etc., is to be seen.

The Several Dunderbergs.

In answer to a letter from the East making inquiries about the Dunderberg mine we may say as there are several mines, bearing this name we are at a loss to know which particular one is by the writer inquired of. There is to our knowledge a Dunderberg mine in Colorado Nevada and California, and we believe also one in Utah. The Colorado mine is a valuable property and adjoins the largely productive and profitable claim known as the Terrible. For several years operations upon it were much retarded, and at times wholly stopped through legal complications, all of which are now happily disposed of. The mine yields much good ore, making a bullion production of about $25,000 per month, with a fair margin for profit. Without any doubt the Colorado Dunderberg is a mine of merit, having a prosperous future before it.

The Nevada Dunderberg is located at Eureka in the midst of a group of notable claims, being in close proximity to the Eureka, Richmond and the Ruby mines. The latter is owned by an English company who, having also purchased the Dunderberg, the two have been consolidated and are now being worked as one mine. Both claims make a good showing of ore, the Ruby having been extensively developed.

The California Dunderberg lies in Mono county, a short distance west of the Bodie mines now making such a splendid exhibit of mineral wealth. It occupies a section of an immense ore-bearing lode that here strikes north and south along the easterly base of the Sierra Nevada. It has been opened by means of a tunnel, that fails, however, to drain its lower levels, which in the absence of pumping machinery have filled with water. As a consequence, nothing has for some time past been done here in the way of ore extraction. A first-class mill has been put up at the mine, a large amount of money having been expended upon the property, which with a comparatively small outlay could be brought into a condition fitting it for large and profitable bullion production, extensive ore reserves being already opened up in the mine. The natural facilities that exist here for the prosecution of mining are nowhere excelled, the whole country being covered with magnificent forests and water being present in unlimited supply. The property, though for several years neglected by reason of the financial embarrassments of the owner, is admitted on all grounds to be one of great value, and now that attention is being strongly turned to that district it will no doubt soon be started into life again.

Labor and Wages.

There is more truth than poetry in the wail of the *Mining World and Engineering Record* about the lack of consideration of working men for the interests of their employers, and says that the competition of foreign countries with England is becoming more and more keen, and that the English as a people must exhibit greater qualities of skill, industry, and perseverance than of late, if England is to retain the supremacy which it has hitherto enjoyed. "Not merely are we being beaten out of the field, but foreigners are entering into competition with us on our own ground. French and German clerks are crowding into our warehouses, and even the field of manual labor is being filled by foreigners."

The Cunard company had the entire paneling of the steamship *Gallea*, executed by Japanese carpenters, the parquetry of the cabin floor on the main deck, and the iron work of the office of the company supplied from Belgium. It is admitted that these foreigners seem to take an interest in the work given them, while English workmen are utterly regardless of anything but short time and high wages. It is claimed that the English working classes by sacrificing the interests of their employers in strikes for shorter hours and higher wages, are bringing about the destruction of England's pre-eminence in the commercial world and by compelling capitalists to look out for laborers who will be devoted to their interests, are destroying their own prospects.

The strife of the laboring classes against capital, and the attempts to compel masters to pay more than the necessities of trade will permit, will bring only ruin to those who indulge in it, by diverting trade into other and foreign channels. This lamented condition of things in England should not be laid at the door of the working men. There are certainly grievances, perhaps on both sides, and it is a singular short-sightedness which cannot distinguish between the cause and the effect.

The rate of wages in England is very low, and the working hours longer than in this country, yet we are able to compete with British productions, so that the trouble cannot be attributed to the English laboring classes. National decay fostered by fossilized ideas incompatible with modern ideas, has more to do with the ruinous condition of things than the ingratitude of the British yeomen.

A FRENCH engineer now offers to build a ship railway across the Isthmus of Darien for $5,000,000, one-tenth of the sum Capt. Eads agrees to do it for.

Mineral Veins.—No. 2.

In continuation of the article in our last issue on the above subject we learn from Prof. Le Conte's "Geology" (Appleton & Co., N. Y.), some of the important laws affecting the occurrence and the richness of metalliferous veins, and propose in another article to give a theory of metalliferous veins, which appears to us to be incapable of refutation as an entirety.

Metalliferous veins occur mostly in disturbed and highly-metamorphic regions, where the strata are tilted, and folded, and metamorphosed. The tilting and folding are necessary to the formation of fissures; and the conditions under which metamorphism takes place seem necessary for the subsequent filling with mineral matter. Mineral veins, therefore, occur mostly in mountain regions and in the vicinity of more or less obvious evidences of igneous agency. Lead veins seem to be an exception to this rule. They are often found in undisturbed regions, where the rocks are entirely unchanged. The rich lead mines of Illinois, Iowa and Missouri, are notable examples, the country rock being horizontal, fossiliferous limestones of the Paleozoic era.

Metalliferous veins occur mostly in the older rocks. In Great Britain, for example, no profitable veins occur above the trias. This rule, which was regarded as of great importance by the older geologists, is not so regarded now. There seems to be no close connection between the occurrence of metalliferous veins and simple age alone; the connection is rather with metamorphism. Metamorphism is most common in the older rocks, and becomes more and more exceptional as we pass upward. The occurrence of metalliferous veins follows the same law. But when the newer rocks are metamorphic, they are as likely to contain veins as are rocks of the older series. The metalliferous veins of California occur in jurassic, cretaceous and even tertiary strata; but these strata are there highly metamorphic and strongly folded. In Bohemia, also, and elsewhere, metalliferous veins occur in the higher series (Phillips, p. 549).

Parallel veins are apt to have similar metallic contents, while veins running in different directions (unless at right angles) are apt to contain different metallic contents. Thus, the nearly east and west lodes of Cornwall, *a, a, a* (Fig. 1), contain tin and copper, while the north and south courses, *b b*, contain lead and iron. The auriferous veins of California are parallel to each other and to the Sierras, except a few smaller ones, which are at right angles to these. The reason of this rule is, that parallel fissures belong to the same system, and were therefore formed at the same time, broke through the same strata, and were filled under similar conditions, and therefore with the same materials; while fissures running in different directions were probably formed at different times, broke through different strata, and were filled under different conditions. Thus, the east and west veins of Cornwall break only through the trias, while the north and south veins break through the cretaceous. The auriferous veins of California all break through the jurassic; they, or their fissures, were all produced at the same time, viz., at the time of pushing up of the Sierras.

A change of country rock of an outcropping vein is apt to determine some change, either in the contents or in the richness of the vein. Nevertheless, there is not that close connection between the nature of the country rock and the vein contents which obtains in infiltrative veins. The reason is, that infiltrative veins derive their contents entirely from the wall-rock on either side, while fissure veins derive their contents from all the strata through which they break, even to great depths, and especially from the deeper strata. The nature of the surface or country rock is, therefore, only one factor, determining the vein contents.

Metallic veins are usually richer near their point of intersection with granite or with an igneous dike, especially if the strata have suffered metamorphism. This shows the influence of such heat as is present in metamorphism, in determining the metallic contents.

If two veins cross each other, especially if at small angle, one or both are apt to be richer at the point of crossing. No sufficient reason has been given for this law. It is probably due to the reaction of waters bearing different materials circulating in the two fissures.

Since veins are the fillings of fissures, they are often slipped by each other or by dikes or by simple unfilled fissures. If a metalliferous vein is thus slipped, the footwall of the vein has usually gone upward and the hanging wall dropped downward. The great importance of this law in practical mining is sufficiently obvious.

The surface indications are to be learned by attentive observation in each case.

Our knowledge of the conditions under which, and the chemical process by which, fissures have been filled with mineral matter, is yet, unfortunately, very imperfect. Many vague and crude theories have been proposed. Some have supposed that they have been filled in the manner of dikes and granite veins by igneous injection; others, that these fissures, opening below into the regions of incandescent heat, have been filled by sublimation, *i. e.*, by vaporization of certain materials and their condensation in the fissures above. Some suppose that electric currents, such as are known by observation to traverse certain veins, have been the chief agents in the transference and accumulation of the mineral matter. Still others have thought that great fissures have filled in the same manner as the smaller fissures and cavities of every kind found in the rocks, viz., by infiltration of soluble matters from the fissured rocks. There is certainly considerable analogy between small infiltrative veins and great fissure veins in their mode of formation; yet there is a decided difference. The fillings of infiltrative veins are derived, in each part, entirely from the bounding rock on either side. The fissure is filled by a lateral secretion from its walls; the broken rocks heal themselves "by first intention" by means of a plasma oozing from the sides. But great fissure veins derive their contents in each part from all the strata to great depths, and especially from the deeper strata. Hence the contents of these veins are far more varied.

MAP OF CORNWALL LODES.

Exhibition Advantages.

A private display of goods, wares and merchandise, in the windows of a merchant on some busy thoroughfare, is intended to attract the attention of transient purchasers and to excite a desire to buy in those who would not think of purchasing if some attractive article was not exposed to view. So essential is this display that the merchant who retains his stock in a dim, disagreeable, or unexposed locality, is quite sure not to retain many old customers or acquire any new ones. The general independence manifested by our people is very clearly observable in their seeking for goods in localities most suitable to them. The general idea of "good will" as applicable to business does not obtain to any great extent in this country, and we find purchasers buying at one place to-day and at another to-morrow, wherever greater advantages are offered.

Now an exhibition is nothing but a mart, a concentration of the best articles manufactured, grown, or for sale in a whole city, county, state, country, or of the world, as in universal expositions. Here the intending purchaser can find the requirement of every demand displayed before him in a small space, and can examine goods, and witness the workings of machinery, or ascertain what his neighbors are doing, with ease and comfort to his physical nature, and with instruction and profit to his moral characteristics. The financial depression that afflicts so many at present requires an examination of prices, and those seeking to invest naturally desire the greatest quantity of first-class goods for the least money.

This can only be done with satisfaction at a general rendezvous of trade, such as our Mechanics' fair, and those who do not exhibit, or who do not sufficiently extol the merits of their wares to the public through the medium of advertisements must not be surprised at a vast diminution of their sales, and corresponding loss of profits, although their goods may be as good as those better advertised.

The sharp competition that exists will not permit a "take it or leave it" spirit on the part of the salesman. The public must be offered inducements to purchase. At the Fair will be assembled thousands from every part of the State, thousands who have been waiting for this very Fair to see what is in the market before purchasing, and it behooves every exhibitor to exert himself in the direction of securing the coin laid away for purchases at the Fair. A certain sum must be laid aside for the purpose of advertising, for in these times it is useless to expect to make money without such an investment. Money must be earned, and the profits are correspondingly large in proportion as the articles are better known.

All branches of business are dependent upon each other for support, and to patronize one business is to influence others. There is always something more desired by purchasers that our next neighbor may have if we have not, and so on all along the line. Demand cannot be created so largely in ordinary business, but at a general mart or exhibition a demand is created which is felt for a long period. Then, too, witnessing the latest devices side by side, inventive genius is excited to supply deficiencies which always exist in human affairs.

MINISTER WELCH having resigned the English mission, immigration to Washington is immense.

Fair Results.

The grand result of the Centennial exhibition at Philadelphia, in 1876, was the unparalleled orders that came from foreign countries to the United States for American production. Orders for locomotives and engines generally, have in certain localities, become so numerous that the home supply has been crowded out in providing for outside demand. Other productions are spreading over the whole world, even to the detriment of other countries, who in spite of cheap labor cannot compete with us.

South Africa sets up a wail over the fact that that portion of the world is supplied from America with lamps, hand-trucks and a thousand other articles of improved construction, and far better value than got from England.

Then, again, 15 cargoes of all kinds of miscellaneous articles, from a wagon to a shoo-peg, were sent from Boston to Australia, in 1878.

The British looms are being pressed so closely by American manufacturers that many English machine and cloth manufacturers are preparing to transfer their works to German soil!

Sprightly little Belgium, a giant by the way in inventive adaptations, proposes to establish for self-preservation a permanent museum in Shanghai, in which will be exhibited specimens of all descriptions of Belgian manufacture and produce. While the United States have already begun to move in Brazil, by establishing what is called the American "Bazaar" in Rio Janeiro, a permanent exhibition of American manufactures, a private enterprise.

Even Switzerland is distressed about her watch manufactories, being unable to compete with the United States in the world's market, or even in her own.

Even so wise a statesman as Gladstone declares that the scepter of commercial supremacy is passing away from England to the United States.

The continual struggle against American articles, the warnings of the foreign press, and the careful revision of tariffs to keep the "cussed Yankees" out, never can be done, because we are needed in the markets of the world. All our vast foreign trade, constantly increasing, is due to two facts alone, viz., competitive displays at exhibitions, and the skilled and perfect adaptation of productions to the various wants of the world.

An American machine, that is, one made in the United States, has a graceful, harmonious appearance, there is no superfluity about it, and it works like a charm, while on the other hand, if made in Europe, it has a cumbersome, pudgy, plum-pudding, beer-barrel or jumping-jack appearance. An American inventor takes advantage of others' defects, and has been enabled to do this by studying the world's productions at exhibitions. Had there been no exhibitions, there can be no doubt but that we would be behind considerably in our progress, too far behind perhaps.

In a local way fairs have the same results, a lively competition, and increase of business. Men have latent wants, which they do not themselves know anything at all about until called into existence by some new mechanical device, then the deed is done, and the fruit of public displays is apparent in the revival of trade sure to follow.

NEW METALLURGICAL WORKS. — Messrs. Guido Kustel and E. N. Riotte, two well-known metallurgists and mining experts, have opened metallurgical works in the basement of No. 318 Pine street, at the corner of Leidesdorff. They are prepared to crush and sample ores, and make working tests by any process desired. Assaying and analysis of ores, minerals, waters, etc., will also be done. These gentlemen are prepared to give practical instruction in treating ores by approved processes, and the assaying and metallurgy of gold and silver will be taught theoretically and practically. Parties desiring mines examined and reported on may also call on Messrs. Kustel & Riotte, both of whom have excellent reputations for ability and integrity in their professions. They have both had a great many years of practical experience in all branches of mining and metallurgy on this coast, are familiar with all the processes, and are peculiarly well qualified for the business which they have now undertaken.

Evans' Amalgamator and Concentrator.

George R. Evans of this city has recently obtained a patent through the MINING AND SCIENTIFIC PRESS Patent Agency for an improved apparatus for amalgamating and concentrating the precious metals, saving sulphurets, etc. The apparatus consists in the novel combination of a pan having a horizontal reversing movement, with a series of arms or blades having a similar motion in opposition to that of the pan, said blades moving within the pan. These blades have each an adjustable removable sheath formed of copper, or other suitable amalgamated or plated metal, and they are connected with a slide moving in a guide and having an operating lever, by which they may at pleasure be lifted out of the pan.

The pan is charged with the proper amount of pulp, tailings, or with auriferous earth, if used in placer mining, and a sufficient quantity of water is introduced. It is then set in motion, when the reverse movements of the pan and blades thoroughly separate the heavy valuable portions from the lighter earth or pulp, and allow them to settle to the bottom.

The silver-plated or amalgamated sheaths of the blades will be brought into contact with all particles of float-gold or amalgam which are too light to settle by specific gravity, and they will thus be taken up and saved. The blades may at any time be raised and the sheaths taken off, cleaned and replaced, after which the pan may be again charged.

The form of the lower part of the pan is as nearly as possible that of the common miners pan in ordinary use in hand work for washing placer gold, and the peculiar movement given it, and the contrary movement of the blades, produce an effect upon the heavier and more valuable particles which causes them to work to the bottom.

Every miner knows the peculiar shake and rocking motion it is necessary to give to a miner's pan in washing out gold, and knows also that there is a back in doing it by hand only learned by experience. Mr. Evans, who is an old miner, has endeavored to imitate this peculiar motion, by suitable mechanism, so there shall be no variation in the movement, but the process will be the same at all times. The contents of the pan are moved by the blades or arms in a contrary direction to the movement of the pan, which is precisely the action which takes place in a pan which is worked by hand in placer mining.

The device is capable of working a low grade of pay dirt or sand at a profit, and in working silver ores it takes the pulp directly from the pans or batteries and enables the inventor to dispense with the settlers. He is also enabled to dispense with blanket sluices. The fine floured quicksilver and sulphurets, which are usually lost in settlers, are saved to a greater extent in this separator, as there is no overflow, and the counter action of the blades and pans tends to cause the light particles to sink to the bottom of the pan by reason of their specific gravity.

Small-sized portable machines made in this form are suitable for placer mining, and may be worked by hand like a rocker. The large-sized machines for working pulp or tailings are worked by power. A series of the pans may be worked together when a large quantity of dirt is to be washed. The pan is made with partially converging sides, so that when the blades act upon the contained mass of pulp they will tend to concentrate the more valuable portion to the bottom. The crank arm is fitted to a feather on the shaft so that the shaft may be raised at any time while the blades are in motion. The pan is provided with openings whereby to draw off the contents from any level as desired.

The present settler loses a great deal of floured quicksilver, because there is no reverse movement, and the constant agitation keep it in suspension, and allows it to pass off. In this machine the amalgamated blades catch this floured material, and in case a quantity collects and is dislodged from the blades, it has acquired sufficient specific gravity, by aggregation of particles, to settle to the bottom, where it is caught. The main loss of quicksilver at present is in the settlers, which this machine is intended to replace, so that all the fine material may be saved.

The machine may be used to pan down earth from placer mines, or concentrated material from sluices, much quicker and more readily than by hand. There are many places on the rivers and creeks where it will not pay to work with rockers on a small scale. A machine of this kind, which will handle a comparatively large quantity of earth in a short time and with a small quantity of water, and not much expenditure of power, would be very useful in such localities.

In gold mills this machine takes the material direct from the battery, and is intended to save gold, quicksilver and sulphurets from the batteries, without the intervention of copper plates or pans.

The owners of this patent are George R. Evans, Garret H. Hopper and Joseph Hutchinson. A working model of the machine may be seen at Hawkins' machine shop, No. 210 Beale street, between Howard and Folsom, where it may be examined by those interested in such devices.

SEND in exhibits for the Mechanics' fair to open on Tuesday, Aug. 5th, and be prepared for a revival of trade.

Business Directory.

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GEO. LETTE, Secretary.

San Francisco, June 30th, 1879.

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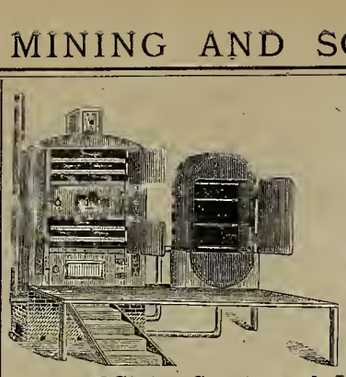

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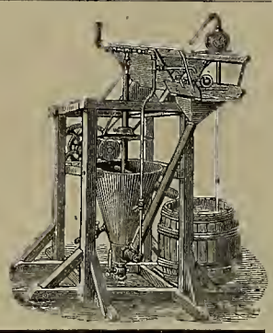

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Well built and hard finished. On the higher ground there is a

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40 by 80 feet in extent, and 8 feet deep, well stocked with Carp and Trout. The pond is supplied with water from a never-failing spring a few feet distant, which delivers 24,000 gallons of water every 24 hours the year round. The pond is at an elevation of 20 feet above the house, and from it pipes are laid for irrigating the orchard and garden, and supplying the house.

The balance of the place is now devoted to grass and grain, but may be improved for orcharding or other cultivation if desired.

This place affords a rare opportunity for anyone desirous of securing a well-improved locality for an elegant country residence, and will be sold at a great bargain. For further information apply either at this office or of the proprietor on the premises.

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The undersigned, owners of LESCHOT'S PATENT for DIAMOND POINTED DRILLS, now brought to the highest state of perfection, are prepared to fill orders for the IMPROVED PROSPECTING AND TUNNELING DRILLS, with or without power, at short notice, and at reduced prices. Abundant testimony furnished of the great economy and successful working of numerous machines in operation in the quartz and gravel mines on this coast. Circulars forwarded, and full information given upon application.

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This Institute, by combining medical hygiene with the various Water Cure treatments and the most powerful Electrized Horseshoe Magnet in the world, claims to cure speedily and permanently all forms of acute or chronic nervous derangements, Brain, Spinal and Heart diseases, St. Vitus Dance, Palsy, Epilepsy and all Rheumatic, Liver and Kidney troubles. The institution has for the past 20 years made a specialty of treating all forms of weaknesses and diseases peculiar to males and females. By the use of hygienic remedies and electro-motorpathy the worst forms of impotency and seminal weakness in males and sterility in females are speedily and permanently overcome. Hygienic board, with or without rooms. Terms moderate. Electro-thermal, Russo-Turkish and Medicated Baths given daily.

MRS. DR. SMITH as Matron has charge of the female bathing department.

DR. SMITH has practiced Phrenology the past 30 years, and during the last 20 years has been constantly using the science connected with Physiognomy, in examining or diagnosing disease in this city, and claims to have made discoveries in the SCIENCE of Phrenology that enables him, by an examination of the head, even blindfolded, to determine the disease to which the person is constitutionally subject, or whether the disease at the time afflicting the person, is the result of accident or hereditary weakness; whether CONSUMPTIVE, DYSPEPTIC, RHEUMATIC, APOPLECTIC, NEURALGIC, LEUCORRHŒAL, or SEMINAL. Especially does the form of the head indicate the strength of the uterine, genital or reproductive system. The head is also an index of the natural strength of the lungs, heart, stomach, liver, kidneys, spleen, back or vertebra, and it determines the power of the system in warding off and overcoming disease of all kinds.

Ladies or gentlemen, desirous of obtaining a thorough and correct Phrenological examinations with Fowler and Wells' charts, will meet with a respectful reception at his consulting rooms. Parties can depend upon a reliable delineation of the character of their intimate male or female friends, by presenting a clearly defined photograph.

Phrenological or Physiognomical examinations without charts, $1.50; with charts, from $2 to $3.

INVITATION TO INVALIDS

And all persons who are in any way out of health, who desire to know the nature and causes of their disease, may avail themselves of an examination through phrenology in regard to health free of charge, between the hours of 9 A. M. and 8 P. M. Sundays from 9 A. M. to 12 M.

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THE STETEFELDT FURNACE CO.,
By C. A. STETEFELDT, President.

Referring to the above, the undersigned would call attention to the fact that by a compromise recently effected with the STETEFELDT FURNACE COMPANY, they have secured the use of all the patents of said Company applying to

Revolving Cylinder Furnaces,

And are thus enabled to give purchasers the license of all patent claimants, to-wit:

WHITE, HOWELL, THOMPSON,
— AND THE —
Stetefeldt Furnace Company,

Thereby avoiding all further litigation in reference to these rival claims. The great

SUPERIORITY OF THE FURNACES

Embracing these patents has been satisfactorily demonstrated. There are now some thirty of them in operation in the various mining districts of the coast, operating in all cases with economy and satisfaction, working in many localities

THE BASEST AND MOST REFRACTORY ORES UP TO 90 AND 95 PER CENT.

By an improvement—the patent for which has recently been allowed—this Furnace can be readily adjusted so as to work with equal facility and effectiveness all classes of ores.

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ARIZONA.—Tiptop, Tiger, Peck, Hackberry, Corbin, Tombstone, Bradshaw.
OREGON—Monumental.
MONTANA—Alice Mine, Butte City.
MEXICO—Trinidad, Harniguera, Plomoses.
PERU—Cerro de Dasco.

RANKIN, BRAYTON & CO.,
Pacific Iron Works.

CAUTION.—All persons are hereby cautioned against buying from other parties Furnaces embracing the improvements covered by the patents above mentioned, as they will be vigorously prosecuted and involved in heavy damages.

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Washing called for and delivered to any part of the city free of charge.

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Ores sampled.
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WORKING TESTS MADE.
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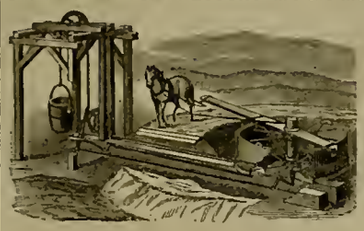
Our DRY AIR COMPRESSORS are the most Economical Compressors in the Market.



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This Power is especially adapted to working mines, hoisting coal or building material, etc. It will do the work of a Steam Engine with one-tenth the expense. One Horse easily hoist over 1,000 pounds at a depth of 500 feet.

The Power is mainly built of wrought iron, and cannot be affected by exposure. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending bucket. The frame of the Power is bolted to bed-timbers, thus avoiding all frame work. When required these Powers are made in sections for packing.

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Consisting of HOADLEY'S STRAW-BURNING ENGINE, 15 horse power, JACKSON'S REMODELED PITT THRESHER, with Feeder, Elevator, Derrick, Forks and Water Wagon,

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Machine Work and Castings of all Kinds to Order.

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which is placed on every bottle of WORCESTERSHIRE SAUCE, and without which none is genuine.

Ask for LEA & PERRINS' Sauce, and see Name on Wrapper, Label, Bottle and Stopper. Wholesale and for Export by the Proprietors, Worcester; Crosse and Blackwell, London. &c., &c.; and by Grocers and Oilmen throughout the World.

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SILVER PLATED AMALGAMATING PLATES.

The best process yet discovered for saving fine or float gold. Extensively used with great success in gravel and quartz mining in various parts of the Pacific Coast. Over one thousand orders have been filled, and the demand is constantly increasing. Old Mining Plates bought or taken in exchange for new Silver Plated Plates. Gold extracted from old Plates at a moderate cost. Old Plates (which often contain a surplus of gold above the cost of plating) can be re-plated.

With the most extensive facilities on the Pacific Coast, orders can be filled very promptly and satisfaction guaranteed. All kinds of metal goods plated. Send for circular.

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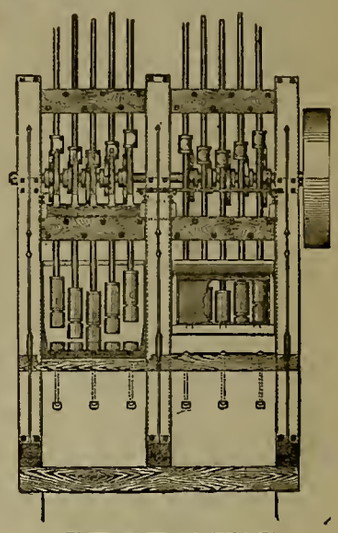
Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver Ores, Chloridizing Furnaces, Retorts, Rock Drills, Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill Supplies.



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Great saving in time and money over the wood frame. Is made complete with wrought-iron frame ready to put upon the foundation, requiring no skilled millwright. These mills are unsurpassed in excellence in every particular.

We are furnishing all the Machinery for a 10-Stamp Gold Mill, including Crucible, Steel Shoes and Dies, Boiler and Engine, Counter Shafting, Pulleys, etc., Stamps weighing 450 lbs. each, with Copper Plate inside of the Mortars, and for tables outside, making all the Machinery complete for a 10-Stamp Mill for the sum of

$2,250.

We construct Mills with Stamps weighing from 350 to 900 lbs. for gold or Silver Ores. Wet or dry Crushing Mortars. Will contract to erect complete Gold and Silver Mills on the most Improved plans. We have 30 years' experience in mining and milling Gold and Silver Ores, and can compete with the world. Send for a circular. Address

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The Prospector's "Wee Pet" Assayer, (Patented)	100 00
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MODEL MAKERS.

INVENTORS

Will find it to their advantage to call on us at 328 BUSH STREET, bet. Montgomery and Kearny, (up-stairs,) S. F

[CONTINUED FROM PAGE 69.]

plenty more of the same sort. The Little Oak lode, in Dead Mule gulch, the property of Montgomery, Odor Bros. and the *Prospector*, is growing extremely rich. Two shafts are being sunk on the claim, one of which at seven ft has shown up a well-defined vein three ft in width, the ore from which, at the depth of eight ft, yesterday assayed 600 ounces.

ITEMS.—*Register*, July 18: It is said that on the Gunnison and San Juan a gold lode was discovered a few days ago, carrying fres gold from rock down three ft. The rock assayed $3,400. The Golden Fleece, located at Picayune gulch, two miles from Animas forks, produced surface gold assaying as follows: Gold, 3,051 ounces; coin value, $161,420; silver, 5,598 ounces; coin value, $6,269.76; total, $167,289.76. From 390 pounds of second-class ore was obtained, by mill run, 10 ounces gold, 53 ounces silver. From 1,331 pounds of third-class ore was obtained 5 ounces gold, 41 ounces silver. The Golden King, an extension of the Golden Fleece, produces ore from pay streak 12 inches wide, assaying 3 ounces gold, 417 ounces silver, a total valuation of $554.07. At Mineral Point the mines are active, with good ore on most of the dumps. In the San Miguel district the Lena, at present working, shows a pay streak of high-grade copper, assaying 800 ounces in silver per ton, with a trace of gold. In the Diamond tunnel the vein is over four ft wide, carrying good ore the entire width. From the Susquehanna 13 tons were sampled and promise a run of at least 250 ounces to the ton. From the Aspen mine 100 tons of ore have been taken that will average 175 ounces in silver to the ton. Rich float has been found in Hansen creek, near the Burro Cabin, indicating the existence of a valuable silver-bearing vein.

IDAHO.

ITEMS.—*World*, July 22: A piece of ore from the bottom of the Montana shaft assayed $200,000 per ton. The soldiers have found some very rich ore at the mouth of Loon creek on the Middle Fork of the Salmon. It is as rich as any at Yankee Fork. In the Banner district, parties have located a mine discovered by them one mile east of the Banner. They have named it the Silver Belle. Two men are at work sinking a shaft on it. From Deadwood we learn that two companies of white men, Morlan & Staley and Wise & Co., and two companies of Chinamen are engaged in placer mining there. They got to work early last spring and have had a good run. A good many men are in there prospecting for quartz. Wise & Co. will commence crushing ore from a mine owned by them in an arastra in a few days. The news from Yankee Fork is discouraging. There is some rich rock here, but far from being in such quantities as represented. The country rock is porphyry and is filled with iron pyrites and sulphurets, containing no silver or gold, and looks, to one not familiar with that kind of ore, to be rich. Three arastras are at work here with the finest kind of water-power, and the ore worked will not assay $75 a ton, when they claim they have $2,500,000 in the mine.—Many of the mines rich on top have run out at a short depth.

MONTANA.

ITEMS.—*Miner*, July 22: The Dexter mill was shut down a day or two ago to remain closed about a week during which time will be made the changes necessary to convert the mill from a dry to a wet crusher. The smelters, in which the owner of the Dexter is interested, will soon be in operation, when ores too base for free-milling processes can be worked to better advantage by smelting than by roasting and amalgamating. Working as a wet crusher, the Dexter will reduce five tons per day more than its present average, at a labor outlay of two men less than the force employed in dry crushing. The introduction of the appliances required in wet crushing will not involve any change of the apparatus heretofore in use. In future the mill can be used either as a dry or as a wet crusher as it manager may elect. The Cornish rolls, sampling mill, etc., of the new smelting works were put in operation last week, and will hereafter run as occasion may require. Ores are now correctly sampled, and purchased at their true market value by the smelting company. Considerable gold dust is being brought into town from Emigrant, Bear and Crevice gulches. Several thousand dollars' worth has already been purchased this summer by Messrs. Story & Wilson and Bozeman merchants. Tom Garvey pounded out $3 from one pound of rock from Wm. Shield's mine, at the head of Spring gulch, near Summit, and says there is an abundance of ore in the mine that will discount these figures. Parties are contemplating the erection of another smelter at Glendale for the purpose of reducing ores from the Elm Orlu and other mines in the Burnt Pine district.

NEW MEXICO.

CURRELLOS.—Leadville *Reveille*, July 18: This is a new carbonate district near Santa Fe. The veins are very large and numerous, but the ores are not high grade at the present development, yet are quite uniform, averaging about 60 ounces of silver per ton.

OREGON.

ITEMS.—*Times*, July 25: Desselles & Co.'s Scott's gulch claim and the hydraulic mine of Wimer & Co., near Waldo, are both running day and night. Water is failing generally and most of the large hydraulic companies will soon be obliged to suspend operations for the season. It is reported that certain parties mining on Silver creek took out $240 in a single afternoon. It proved to be a pocket in the bedrock. A clean-up was commenced at the Sterling mine last week, which will conclude this season's operations. Some excellent ground has been washed off and a large amount of gold dust will no doubt be realized. The miners of Gall's creek have all finished for the season, with the exception of Pfeil Bros., who will not complete their clean-up until several weeks later. The spring run has proved a fair one, in a financial point of view.

NEW DISCOVERY.—*Bedrock Democrat*, July 25: Messrs. Irvine & Co., have discovered new placer diggings, consisting of a large body of pay gravel, some five miles from Sparta, on the road to Eagle valley. The company is down some six or seven ft in the gravel, and they are working with a new process.

UTAH.

ITEMS.—Silver Reef *Miner*, July 23: Bingham miners are turning their backs on lead ore and rustling among gold claims, which are quite numerous and more profitable. Sixty-four pounds of bullion valued at $9,000, from the Crimson Mammoth, Tintic, was received in Salt Lake the other day. Hoisting machinery has been shipped from New York for the Russler mine, American Fork. This property belongs to the Excelsior mining company, headquarters in New York.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Gold Hill, July 19th, $15,882.47; Hilleide, July 24th, $4,300; Indian Queen, July 21st, $5,078.07; Bodie Con., July 21st, $10,611.67; Northern Belle, July 21st, $7,518.94; Gold Hill, (I. T.) July 26th, $7,157.78; Alexander, July 24th, $5,706.19; Northern Belle, July 23d, $5,474.82; California, July 23d, $48,075.16; Hillside, July 27th, $4,000; Martin White, July 23d, $7,015.60; Ophir, July 26th, $24,361.95; Belle Isle, July 28th, $26,000; Independence, July 28th, $7,300; Belle Isle, July 28th, $26,000; Christy Con., July 26th, $5,347; Ophir, July 26th, $24,361.95; Northern Belle, July 26th, $10,151.41; Hillside, July 29th, $4,000.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS TO DEWEY & CO.'S MINING AND SCIENTIFIC PRESS PATENT AGENCY.]

FOR THE WEEK ENDING JULY 22D, 1879.

217,766.—COMBINED RAIL AND TELEGRAPH CONDUCTOR—P. Barrion, Black Diamond, Cal.

217,770.—SIGHT FOR FIRE-ARMS—Wm. H. Brodsl, Oakland, Cal.

217,807.—ELECTRO-MAGNETIC MOTOR—J. C. Ludwig, S. F.

217,740.—REAMER FOR DEEP WELLS—Charles A. Mentry, Newball Station, Cal.

217,752.—GUN WIPER—J. P. Simonds, S. F.

217,835.—NOSE CLAMP FOR EYE-GLASSES—N. Watry, S. F.

217,841.—SEWER-TRAP ATTACHMENT—Wm. Wilson, Oakland, Cal.

217,775.—WATER-LIFTER—A. Collie, Modesto, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telgraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

IMPROVED SIGHT FOR FIRE-ARMS.—Wm. H. Broden, Oakland, Cal. Dated July 22d. This invention relates to an improved gauge-sight for hunting purposes; and it consists in placing on the ends of the barrel a clamp provided with a block or sight on the outer side of each barrel, and by covering the bird with the one which is nearest him in flying, the shooter is looking at the object at the proper angle out of the line of the barrel, so that the shot will hit as it comes in line. It also consists in providing the clamp with two shoulders and leaving a space between them, so that by looking through this space in shooting at a bird flying away both barrels will cover the object. Between the barrels there is an inclined groove and a movable sight may be used on it for greater accuracy in certain kinds of shooting.

AUTOMATIC GATE FOR FLUSHING SEWERS.—S. S. Tilton, S. F. Dated July 8th, 1879. This invention relates to a device to be applied to sewers having but little grade, for the purpose of storing up the flow of water and sewage matter until a considerable quantity has been collected, when it is allowed to be suddenly discharged so as to produce a current which will flush the sewer and sweep out any accumulations which may be deposited on it. The construction of this gate is simple and the parts are accurate in their operation.

SEWER-TRAP ATTACHMENT.—William Wilson, Oakland, Cal. Dated July 22d. The object of this invention is to prevent siphonage from the S-trap of waste pipes and sewers, and it consists in attaching to the trap a chamber connected to the lower bend of the trap and the main pipe, so that it will fill as the trap fills. When water in the trap siphons off, the supply in the chamber passes slowly into the trap, thus filling it, closing a valve in the pipe and preventing the entrance of sewer gas into the room in which the basin is placed.

NOSE CLAMP FOR EYE-GLASSES.—Nicholas Watry, S. F. Dated July 22d. The object of this invention is to produce a more comfortable means for holding eye-glasses in position than has heretofore been used, and it consists in making the clamp, which is fitted between the frames to hold them in position on the nose, of spiral springs, instead of a stiff band, so that while the eye-glasses are held firmly in place, they do not annoy the wearer by undue pressure upon the nasal organ.

WATER LIFTER.—Alexander Collie, Modesto, Cal. Dated July 22d. This invention consists in a peculiar construction and operation of a water lifter, whereby a column of mercury is utilized in producing a vacuum which will lift water from a well. Double sets of tubes are used, one balancing the other, and the discharge of the water is utilized in increasing the weight of the tube in which the mercury is lifting the column.

CAMERON STEAM PUMP.—Messrs. Prescott, Scott & Co., (Union Iron Works) have the agency for the well-known Cameron steam pump. It is adapted to every variety of mining purposes, and applicable to general use. The tests to which this pump has been subjected leave no doubt of its merits and working capacity. We are always gratified to note the introduction of competent machinery on this coast. The severe strain required will admit of none but the best machinery, and we know the Union Iron Works have not failed to maintain our reputation in that respect.

IN trying to please Tucson, Arizona, an old picture of that city has been published, which has been excepted to as not fairly representing the appearance of the city. We did the best we could—the trouble lies in the improvements keeping so far ahead of the photographer.

California Academy of Sciences.

The regular semi-monthly meeting of the Academy was held Monday evening, July 21st, Vice-President Harkness in the chair. In compliance with a request of the Society, Dr. Kellogg read a paper on the life and services of the late John B. Trask, M. D., a life member, and one of the founders of the Society. W. N. Lockington read a paper on some of the crustacea of this coast.

The following paper was read by Dr. A. W. Saxe, of Santa Clara, on the subject of a

Remedy for Grape Mildew.

The grape mildew (oidium) is familiarly known to all microscopists, its ravages are too well understood by all vine growers, to require any specific description. The object of the following paper is to point out a simple, economical treatment of the vine by which its ravages may be averted.

In the winter of 1868, having suffered the loss of all my grapes, in a small vineyard of 150 vines, from mildew, I cast about for some remedy for the disease. My neighbors were using sulphur, and were to some extent successful in preventing the disease. I had used it also, but found that unless three successive applications of the sulphur were made, the first on the opening of the buds, the second on the falling of the blossom, the third when the grapes were about one-third grown, there was no certainty of success. And that often after the utmost care the grapes were so far injured as to be of only second or third rate quality.

The fact that wheat growers uniformly applied a solution of bluestone (cup. sulph.) to their seed before planting to prevent smut, suggested to my mind the use of this agent in combatting the mildew upon the vine.

My vines being at that time some ten years old and covered with rough loose bark, I had them cleaned immediately after pruning, by a small triangular steel scraper, and then a solution of bluestone, four pounds to five gallons of water, applied with a swab to the dormant fruit buds and to the entire body of the vine. Then after carefully spading the ground, no further attention was given to the vines during the season. The result was an entire absence of mildew and perfect grapes.

From the above date to the present season I have omitted or neglected to apply the bluestone three seasons—1873, '76, '78; the result has been diseased vines and no grapes.

Last February, after my vines were pruned, I employed a man to clean out the vineyard and apply the bluestone solution. He did his work faithfully, but omitted to apply the solution to one row of 12 vines of the Black Frontignan variety. At this date, July 1st, all the vines are healthy except this row, which is now exhibiting the curled everted leaf so significant of the disease, and I have applied sulphur, but with little probability of saving the fruit.

The above is a concise narration of my experience and observation, in regard to the use of the bluestone for preventing mildew upon grapevines.

Young healthy vines having smooth compact bark, are comparatively free from the disease. But after six or eight years of age the forks of the vine become filled with decayed vegetable matter and atmospheric dust, and unless this accumulation is removed it affords a nidus in every plant for the lodgment and subsequent growth of the oidium spores.

Vineyards remote from public highways, on mountain sides, or elevated localities, where the atmosphere is free from dust, suffer least from the encroachments of the disease. But in any locality, having been once introduced it remains, unless it is destroyed by the use of sulphur or bluestone.

My observation confirms me in the belief, that one application of the solution of sulphate of copper to the dormant grape bud is a more complete protection than sulphur however often used, or any other agent heretofore used for the purpose. That as it can be applied at a time when all parts of the vine are accessible, and one application is efficient, there is a great saving of time and expense in treating the vines. That however efficient the sulphur may be when it can be applied directly to the fungus, it cannot be effectually applied after the expansion of the foliage of the vine, except by some other method than that usually employed.

I am satisfied that healthy vines may become diseased after some development of the foliage by proximity to diseased ones, and hence the necessity of making thorough work and leaving no diseased vines to the windward of those treated.

It is needless to say that the solution of the strength above certified is quite destructive to the foliage of the vine.

The application of the solution to the vines, while there are yet two months of moist weather with occasional rains, keeps the salt in a state of solution more or less of this space of time, and is constantly acting as a protection to the vine.

It is desirable that the above facts should have the widest publicity before the next period of treatment of the vine, as they are quite important to the vine-growing interests of California.

SOME of the Paris streets which have Bonapartist names are to have them changed, and one will be called Lincoln.

News in Brief.

THE Spanish Cortes will soon abolish slavery in Cuba.

EASTERN advices report the outlook of trade as generally good.

THE people of Cincinnati have been defrauded by a crooked election.

A VIOLENT hurricane last Sunday in the Adriatic damaged 20 vessels.

NIHILISTS have burned 17 houses at Katlaoff, on the Dnieper.

AT Sierra City, a few days ago, the thermometer marked 101° in the shade.

THE increase of revenue receipts for the year ending June 30th, 1879 is $2,820,740.

TENNESSEE being penniless, Memphis will be obliged to obtain relief from other cities.

THE Bonapartist party of France invites the secession of those who do not support its head.

THE members of the French Corps Legislatif are quarreling over Jules Ferry's educational bill.

THERE is a rosebush in Los Angeles which has borne over 3,000 roses during the present season.

THE temperance question has been solved by the burning of Leight's brewery at East Williamsburg, N. Y.

THE 31st anniversary of the independence of Liberia was celebrated at Savannah July 28th, by 3,000 people.

COONS are making much trouble for ranchers along the American river, especially those who are raising melons.

THE present government of Italy have sought the aid and protection of Garibaldi, who is the D. K. of that country.

THE Free library bills have at last been paid, and the sum of $24,000 will be used this year for library purposes.

THE Evangelists, Moody and Sankey, had a very successful meeting Sunday evening, at Cooper Institute, New York.

A PROPOSITION has been made to exhibit a trick monkey on the Kansas Pacific railroad for the amusement of the passengers.

THE Congressional Committee on Trade and Industry, are busy at Chicago trying to find out what causes dullness of trade.

AMERICAN vines are to be largely introduced in France, in consequence of the ravages of the phylloxera in French vineyards.

LAST Saturday a destructive storm in Monongahela and Alleghany valleys destroyed, at Petrolia, $200,000, many people being left destitute.

SHREVEPORT has quarantined against New Orleans. The situation at Memphis is unchanged. Great fear of the yellow fever exists everywhere.

M. de LESSEPS is astonished that Americans oppose his Darien canal scheme, since he offers to make Gen. Grant honorary president of the company.

COUNT ZICHY, Secretary of the Hungarian Ministry of Public Worship and Instruction, having been accused of corruption has tendered his resignation.

THE Grand Vizier of Turkey has resigned and his office has been abolished, the offics of Premier and Minister of Foreign Affairs being substituted for the Grand Vizierate.

A MATCH game, for a ball and bat, was played last Sunday, between the Lone Star Club, of Visalia, and the Farmersville club. The former made a score of 33 and the latter 22.

HINTS ON NATIONAL CULTURE.—We acknowledge receipt from E. Steiger, publisher, 25 Park Place, New York, a pamphlet entitled "Hints toward a national culture for young Americans," authored by S. S. Boyce. The author seems to infer that "unless the United States adopts an improved system of educational training she will never be able to take her position as the first industrial nation; and that the growth of idleness, discontent and labor riots is to be stopped by supplying the children with the rudiments of a practical, useful knowledge," etc. There is no doubt about the value of an industrial education, but that alone will not put bread into the mouths of hungry families. Hunger and not the lack of education is the mainspring of labor troubles. Give education, but afford opportunities to make that education available, and the evils complained of will be cured. The book, however, is well worth perusal, although in our opinion it does not cover the ground. Its aim seems principally the advocacy of a national school system—a system which might perhaps be as successful as the Indian Bureau.

THE NEW ROUTE TO BODIE.—The Pioneer Stage line travel over the new road to Bodie, which is the shortest from San Francisco by 170 miles. The stages connect with the railroad at Milton. Passengers from here leave on the 4 P. M. boat for Stockton and leave Stockton at 8 A. M. the following morning, connecting with the stage at Milton at 9:30 A. M., and arriving at Bodie at 4 P. M. next day. The advertisement in another column gives the days of departure, and the agents, Messrs. T. J. Matteson and Edward Harrison, at No. 3 Montgomery street, will give all the information desired. Both time and distance are shortened by the new route, which is a desirable one to travel over, and the company are well provided with easy coaches and good stock, so the ride is one to be enjoyed. Our correspondent, Mr. Wheeler, recently passed over this route on his way to Bodie.

The Fairs of 1879.

The following is a partial list of the dates and locations of the agricultural and industrial fairs which will be held this fall on the Pacific coast. In order to make our list complete, we request Secretaries of all fair societies to send us the facts concerning their exhibitions as soon as the dates are fixed:

Mechanics' Institute fair, San Francisco, August 5th to September 6th
California State fair, Sacramento, September 8th to September 13th.
Golden Gate District fair, Oakland, September 1st to September 6th.
San Joaquin Valley District fair, Stockton, September 16th to September 20th
Southern California Horticultural fair, Los Angeles, October 20th to October 26th.
Southern District Agricultural Society fair, Los Angeles, October 20th to October 26th.
Sonoma and Marin District fair, Petaluma, September 29th to October 4th.
Santa Clara District fair, San Jose, September 22d to September 27th.
Napa and Solano District fair, Vallejo, September 16th to September 20th.
Northern District fair, Marysville, September 16th to September 20th.
El Dorado County fair, Placerville, September 15th to September 18th.
Monterey County fair, Salinas City, September 30th to October 3d.
Siskiyou County fair, Yreka, October 1st to October 4th.

ANDERSON SPRINGS.—These celebrated hot and cold sulphur, iron and soda springs are situated in the midst of a pine and spruce forest, in Lake county (a distance of 19 miles from Calistoga, and 10 miles—by an excellent road—from the Great Geysers; the nearest and most accessible pine grove, to San Francisco and Sacramento), beside a living trout stream and surrounded by splendid mountain scenery; in the most invigorating and health-giving climate in the State. Good attention is given to the health and enjoyment of all visitors. Prices are very reasonable. Address Anderson Springs, Lake Co., Cal.

FRESH attractions are constantly added to **Woodward's Gardens**, among which is Prof. Grubor's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

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SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

EXTRA COPIES can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

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[WHOLESALE.
WEDNESDAY M., July 30, 1879.

IRON.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2¾@ 3½
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 7
Norway, according to thickness	6½@ 7
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @
TIN PLATES.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7½
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb, less than cask	9½@— 10
NAILS.—	
Assorted sizes	2 90@3 00

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By authority of the BOARD OF MANAGERS OF THE MECHANICS' INSTITUTE FAIR the publishers of the MINING AND SCIENTIFIC PRESS will issue a large edition of the TENTH VOLUME of the MECHANICS' FAIR DAILY during the FOURTEENTH INDUSTRIAL EXHIBITION, which opens in San Francisco, Tuesday, August 5th, 1879.

It will be of handy size, printed and circulated FREE in the Pavilion, and contain the day and evening programme, a list of exhibits, and official bulletin of the Institute.

Its columns will embrace a large variety of important industrial and scientific information, illustrations and well written descriptions of the general features and most deserving and novel exhibits in the Fair, a record of the Fair and incidents of its daily progress—gay, serious and comic—as they occur.

The best of editorial, reportorial and corresponding talent will be employed, with a view to make the paper of live interest in all its departments and of standard value as a full record of the great exhibition, the wonderful inventions, rich resources and rapid progress of our great Western community.

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The Managers have granted us the exclusive newspaper and special advertising and printing privileges of the exhibition.

Our nine previous volumes have met with unrivaled success and gratifying results to advertisers, nearly all of whom were leading and first-class business firms.

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By past experience, ample facilities, and a fair reputation of doing business in our line, we expect, with the reasonable support of all naturally interested in the success of our enterprise, to make the coming volume superior to its predecessors, and eminently satisfactory to the Institute, to our patrons and to the general public, who are more or less benefited by such an advocate of the substantial advancement of the grand and worthy industries of our Coast.

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Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Numa Mining Company.—Location of Works, Humboldt County, Nevada.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 1) levied on the 13th day of June, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. of Cert.	No. Shares	Amount.
Blasdel, E W, Trustee	27	500	$ 15 00
Blasdel, E W, Trustee	28	500	15 00
Blasdel, E W, Trustee	31	500	15 00
Blasdel, E W, Trustee	47	500	15 00
Blasdel, E W, Trustee	48	167	balance 5 00
Brown, George A	42	500	15 00
McKusick, H J	44	1000	120 00
Pierson, Wm M, Trustee	53	2500	balance 75 00

And in accordance with law, and an order of the Board of Trustees, made on the 13th day of June, 1879, so many shares of each parcel of said stock as may be necessary will be sold at public auction at the office of the Company, 328 Montgomery street, room. 21, San Francisco, Cal., on the 11th day of August, 1879, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale. DAVID WILDER, Secretary.

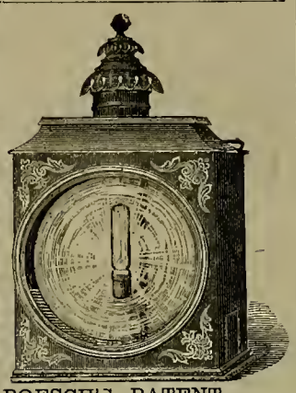
Office, 328 Montgomery Street, room 21, San Francisco, California.

Annual Meeting—Office of the Rocky Point Mining Co., San Francisco, Cal., July 22d, 1879

The Annual meeting of the stockholders of the Rocky Point Mining Company, for the election of a Board of Trustees for the ensuing year, and for the transaction of such other business as may properly come before it, will be held at their office, No. 314 Bush street, San Francisco, California, on Monday, August 18th, 1879, at two o'clock P. M. of that day. Transfer books will be closed on Monday, August fifth, 1879, at 12 o'clock M.

T. L. BIBBINS, Secretary.

EMILE BOESCH,
(Patentee and Manufacturer).
569 Mission St., below Second, San Francisco.



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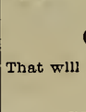

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FOR LIEUTENANT GOVERNOR:
GEN. JOHN MANSFIELD.....Los Angeles.
FOR SECRETARY OF STATE:
DANIEL M. BURNS.....Yolo.
FOR CONTROLLER:
DANIEL M. KENFIELD.....Tuolumne.
FOR TREASURER:
JOHN WEIL.....Sierra.
FOR ATTORNEY GENERAL:
AUGUSTUS L. HART.....Colusa.
FOR SURVEYOR GENERAL:
JOHN W. SHANKLIN.....Alameda
FOR CLERK OF SUPREME COURT:
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FREDERICK M. CAMPBELL.....Alameda.
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E. D. WHEELER.....San Francisco.
STATE BOARD EQUALIZATION—(1st District):
JAMES L. KING.....San Francisco.
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TIMOTHY G. PHELPS.....San Mateo.
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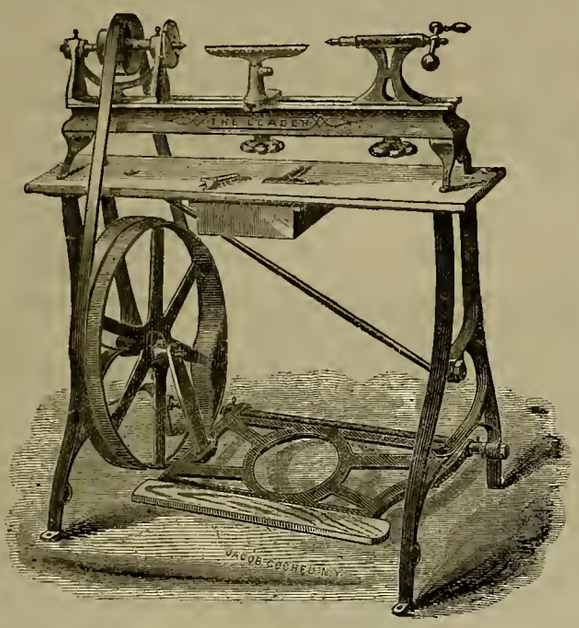

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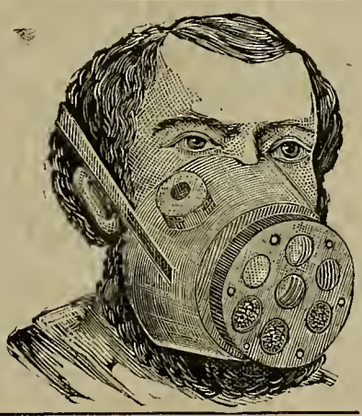

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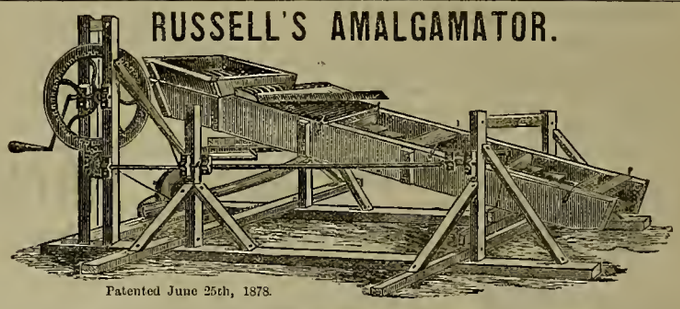

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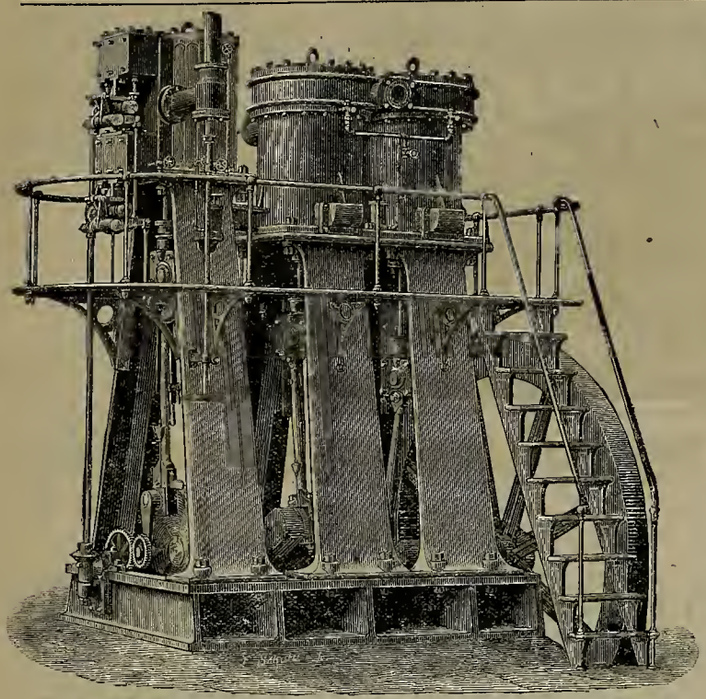

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, AUGUST 9, 1879.

VOLUME XXXIX Number 6.

Prescott, Arizona.

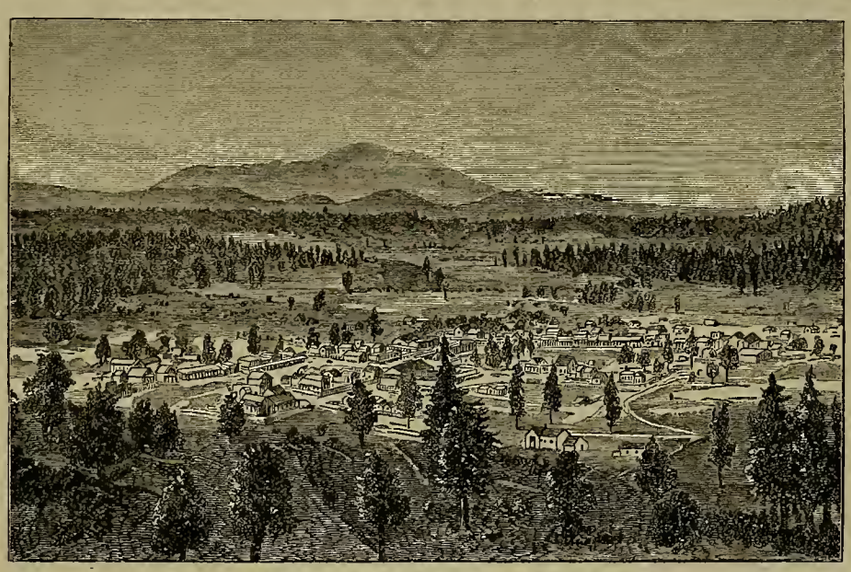
We give a picture of Prescott, the capital of Arizona, taken some years ago, more for the purpose of showing the general features of the surroundings than to delineate the city as it is. The growth of the city is quite rapid, and this fact must be borne in mind when examining the illustration: Prescott was thus named in honor of the eminent American writer, and standard authority upon Aztec and Spanish-American history. The site thus selected is near the intersection of the 34th parallel of latitude with the 112th of longitude. The streets all run with the cardinal points of the compass. A like excellence of judgment was shown by its founders in naming the streets after persons identified with the former or present history of the Territory, such as Montezuma, Cortez, Marina, Alarcon, Coronada, Whipple, Aubrey, Leroux, Walker, Laird, etc. Its broad streets reach out from a central plaza, giving ample space, and avoiding that density of structure and population which so jeopardize the sanitary condition of many of our large cities. The buildings are of stone, brick, and pine.

Prescott is really a home-like place, and would be considered so anywhere. Climate requires one either to live in or out of doors. In Prescott, with high altitude, cool, even raw, chill evenings, its sub-Alpine flora, and the other indications of a decidedly temperate region, one must really live in doors. In Tucson the reverse is almost true. There are no adobes here. There are a few log dwellings—reminiscences of earlier days; but the large majority of buildings are of frame, some business places being of brick, with a few residences also. Really, and without flattery of any kind, Prescott is a very attractive town. It is situated in a small valley, or basin, surrounded on all sides by more or less elevated mountain ranges. In the center of the town is a large plaza, now bare, but which is to be occupied at no distant day by county buildings, for which $60,000 has already been voted. Yavapai county, of which Prescott is the county seat, is, it must be remembered, not only the largest in area, but the best populated of the five into which the Territory is now divided. It claims about fifteen thousand inhabitants.

The vicinity of Prescott offers ample facilities for grazing purposes. The hill and mountain sides, far up to the pine and cedar belt, are covered with the bunch grass—quayotto or black grama. The soil is more moist than to the south or north. It is arid and desolate in both directions to some extent. Sheep do better in the vicinity of the Bill Williams mountains, portions of the Rio Colorado-Chiquito, the famous San Francisco mountains and the vicinity of Mineral Park and the Hulapais than in the immediate vicinity of Prescott. Thereabouts the cattle ranges are good and ranches are quite plenty. Timber—pine in plenty, cedar and dwarf oak to some extent—is found everywhere. This portion of Arizona and north of it will be the chief source of timber supply.

On the northern spur of the Bradshaw or Silver range, one of the best metalliferous formations of northern Arizona, Prescott sits in pleasant security, expecting prosperity, and believing herself the favored town of this wonderful Territory. Its altitude is 6,318 feet above the sea level, and a stranger soon appreciates the fact. The landscape is as marked and massive, but yet its features are smaller and must be taken more in detail, than in southern towns. There is not the same marvelous scope of vision, and hardly as many wonderful effects of color-tone and distance. Still, the artist's eye may readily find materials for captivating pictures, even if he cannot make the range so large as at Tucson or in the valley of the Santa Cruz, where the bold and well defined peaks and serrated summits of the Santa Ritas look down in lusty beauty on the one hand, and the bald, bold outlines of the San Coyetano or Atascosa mountains hem in the other. Towards the north the little plain or plateau on which Prescott nestles opens into a broad sweep of plain, on which Fort Whipple is located, and across which the vision takes in on the east the saw-like summits of the Prista range, with the bold outlines of Granite peak to the west thereof, while still further to the south and west are blue outlines of the St. Marie mountains, from the midst of which Hopo Peak lifts its bold head in the hazy distance. To the north and east again the eye glancing over Prescott plains rests on the sweeping lines of the Black Hills, whose southern extremity comes down almost to the town limits on the east. Overtopping these and at least seventy miles distant, in a direct line, can be seen the San Francisco mountains, snow-covered for several months in the year. To the south the view is almost a closed one, as the Bradshaw range rises boldly in that direction. Looking down over the town, as if protectingly, towers a singularly bold peak or rock formation known as Thumb Butte. It takes its name from a huge pile of rock on its northern end, which, looking down on the village below, appears to be a gigantic hand doubled close, and on the top of this closed hand there appears to be a huge thumb, slightly bent, the end of which lies toward the town. Behind this peculiar formation there is a small table land, across the south end of which are unmistakable evidences of a wall, used, without doubt, for the purposes of defence. There are some appearances left of approaches up this rock and of cave-dwellings on the top. As to the east and south of the town, a line of defense works, so irregular and broken as hardly to be followed, has been made out, it would seem certain that the sight of Prescott was also that of a town or post, once occupied by the people who cultivated centuries since the valleys of the Gila, Salina, San Pedro, Santa Cruz, the Rio Verde, Rio Francisco, the Colorado-Chiquito, Agua Fria, and other streams, leaving as proofs of their industry and skill the evidences of old towns at the Casa Grande and near the Tempe and Phœnix, on the Salt river, as well as many other signs of their extent and character.

The flora and timber of the neighborhood are decidedly those of the temperate zone. As befits the altitude, there is a clear, cold, gray tone in the atmosphere, which lends a peculiar charm of its own to the surrounding landscape. The great pines which clothe the mountain sides almost to their tops fill the still night with that low, soughing wind-music that has such an indescribable though melancholy charm. The sunrise and sunset, especially the latter, drape the tall ridges and high peaks in a variety of striking hues, while the deep, serrated sides of the range lend deep shadows wherewith to tone the picture. In the midst of them, close to the ground, broods the peaceful town.



PRESCOTT, THE CAPITAL OF ARIZONA.

Bucket Shops.

The "combination system" of investment in stocks, urged upon the public, is nothing new except in name. The "system" modestly requests the investment of an enormous sum of money, in contributions ranging from ten to one hundred dollars, upon no other security than promises of large returns from small investments. Here is a direct attempt to inveigle the poor and those in moderate circumstances into a golden snare which has, and always will, result in loss or ruin, to nearly all who are attracted by it. Upon the ground that "wealth is strength" you are plausibly invited to combine your respective small amounts into one grand pool, in the hands, and under the exclusive control of irresponsible parties, to be operated with according to their discretion; to bull or bear the stock market, or to put your money into their own pockets as they may think proper. "All the fools are not yet dead," is the cornerstone of their enterprise, and the foundation of their success.

If "wealth is strength," and a thousand people, with $100 each, can do nothing in the way of speculating as *individuals*," what has become of the combined wealth of some of our best and most solid men? Drawn into this fever of speculation by just such fallacies, they now, from their dishonorable graves, cry out in warning to you, Beware!

You are assured of *absolute* success in your investments in their stock operations, a falser and more dishonest representation was never made in any of the gambling hells of Europe whence this "combination system" came.

It is incredible how any one can be deceived by this barefaced falsehood, with the certain knowledge derived from sad experience demonstrating the lie so plainly, that "be who runs may read." There is no certainty in any *legitimate* business, and even the *probability* of success in stock operations stands at *zero*.

The signs of the times indicate another struggle to bring disaster upon us, before preventive laws can be passed to drive these swindling fallacies from the State. If, dazzled by gilded lies, you invest in this thing, you will surely behold capital leaving the State—capital which can and should be kept here. The effort to keep it here is an easy one to make, the secret of it is "do not invest" in these swindles.

The Sun as an Electric Focus.

The problem of the source whence the sun derives its heat and light is perhaps no nearer a practical solution now than it was a hundred years ago. It is true our knowledge of the constituent elements of the sun has increased, but that knowledge is only abstract. It has been contended that the sun is a burning mass, which, in the course of time, will "burn out," and leave the planets dependent upon it, uninhabited—dead. All of the combustible elements of this earth are said to be stowed-away sunbeams. The coal so largely used as a steam generator and for economical purposes, a product of the sun. Concentrated sunbeams, the hidden heat of which has been brought forth by the industry and genius of man for purposes of comfort and utility. Some writers have declared the sun to be pure fire, not fed by any supply, while others declare it to be the rendezvous of comets, the absorber of dead planets.

Prof. Proctor estimates that in each second of time the sun distributes as much heat as would be produced by the consumption of eleven thousand eight hundred millions of millions of tons of coal. He further estimates that if the sun consisted entirely of coal, burning at this rate, it would burn out in less than 5,000 years.

If the sun derives its combustion from material within itself, it would seem as if there would be some diminution, and since Herschel looked at the orb and calculated its conflagration, such an enormous waste of gases would surely have been noticed by succeeding astronomers whose calculations are quite exact. But the light and heat of the sun is not on the wane.

The latest theory is that the sun is an emitter and receiver of electricity at one and the same time. It is contended that there is a mighty outpour of magnetic currents from the north and south poles of our planet, and that these currents meet and form a complete circuit, the sun being the point of meeting, as it is with the earth, so, also with all the other planets, only the outpour is greater, or less, according to size. Focality produces luminousness, and the currents are sent back to the planets and their satellites in proportion to their respective wants. Scientifically put, the new theory is that the planetary system is a vast magnetic-electric machine, or "generator," the planets being permanent magnets, which, while in motion, generate electricity enough for their own light and heat, with some to spare, the sun is the carbon point" where all these currents meet and become luminous. Thus, the sun, instead of depending on the combustion of coal meteors or other fuel or friction, or "contraction" of its own surface, which would soon leave us in darkness, is dependent upon the electricity generated by the planetary system for its light and heat. This disposes of the non-eternity of the sun as a light-bringer to planets, and buries for an indefinite time Proctor's melancholy theory that the earth will breathe its last and give up the ghost as a life-producing and life-bearing body at a day somewhat too early for happy contemplation. It gives a possible solution of another vexed question, the origin of the aurora borealis, by assuming that when the electric currents are interfered with by meteoric or other bodies, the back-flow produces that splendid phenomenon. Altogether, the theory is worthy the attention of astronomers, who are as much in the dark about the sun's heat and light as unscientific persons.

THE Central Pacific engines burn between 55,000 and 60,000 cords of wood per year between Sacramento and Ogden. It costs from $3.50 to $3.75 per cord delivered on the track. It is all cut between Reno and Auburn.

A VEIN of coal 10 feet thick has been discovered in Cassia county, Idaho.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds

Ascent of Mt. Shasta.

[Written for the PRESS by J. G. LEMMON.]

Mt. Sbasta is the most impressive peak known to travelers. The grand distinguisbing features of Mt. Sbasta, those whicb give it this pre-eminence, are not eo much its lofty hight of 14,442 feet, but first its entire isolation from otber peaks, aud second its majestic up-rise of nearly 11,000 feet from tbe midst of a beavily forested plaiu, broken here aud there only by meadows of rohust grasses and rich cultivable fields.

The group of lofty peaks in southern California—Whitney, Kaweah, Tyndall and King, though from 200 to 500 feet higher than Mt. Shasta, fail to strike the beholder as predominant peaks, because they stand on an elevated plateau 8,000 to 11,000 feet high, a plateau clotbed with forests and easily reached by horsemen.

Tbe plain arouud Sbasta is only 3,567 feet high, from which the magnificent double cone arises over two miles vertically, in a lineal iucline of less than ten.

Through the kindness of Gen. B. B. Redding I was invited to join his party for ruralizing in the vicinity of Sbasta, during a portion of the heated term, including the Fourth of July. Himself and most of the party upon arrival at Sissons, at once sought their old haunts for fisbing and hunting over on the McCloud river, leaving me to botanize at will.

Finding a party forming at Sissons for scaling Shasta and learning tbat the first days of July, before forest fires were raging were the best for views, I gladly left off searching copse and meadow for rare flowers and joined this party.

The ascent requires a day and a half. You go the first half day to a etated camp at the timber line and remain for the night. Early the next morning you leave horses and climb the peak, arriving at the monument some time in the P. M. The descent is made, the whole distance of 18 miles, back to the botel by supper time.

On the afternoon of the 7th of July our party of eigbt started from the usual headquarters of tourists at Shasta—Sissons' hotel, in Strawberry valley. We were mounted on surefooted horses and directed by an experienced guide. The trail led at first through a tbinly-forested even plain for three miles, then gradually ascended over rough lava and conglomerate boulders to an upper parterre or bench several miles wide and surrounding Shasta on all sides. Here the common pinee, with the white fir and Douglas spruce, that form tbe bulk of Californian forests, leave off, and the noble fir (*Abies nobilis*), of Douglas, often called from the color of its bark when broken "the red fir," occupies the plateau exclusively. This is perhaps, all tbings considered, the most beautiful tree at all ages in the West. Trees of 5 feet in diameter and 150 feet high, do not depart from the graceful arrangement of their spray in youth, but still display their immense, horizontal, fan-shaped limbs in symmetrical, diminishing whorls to the top. On the upper limbs, erect and firm, stand the purple or yellowish cones, clothed with long, pointed bracts that depend from between the scales, causing tbe cones to resemble owls at roost on the tree tops.

Fringing the upper edge of tbis fir forest and running up the projecting rock-ribs of Shasta, are two more cone-bearers, found only on such elevations in tbis latitude—*Pinus albicaulis*, or tbe "white stemmed pine," and tbe *Picea Pattoniana*, or "silver spruce." Botb these trees are often miscalled; tbe first *Pinus flexilis*, the otber *Abies Williamsoni*, but the former uames have been established by tbe highest American authority after much examination.

The evening of onr camp where timher and snow banks mingle, was clear and fine, inviting to etudy the stars in the brilliant canopy.

Later, after all were under blankets spread over pine and fur hougbs, the cold air poured down the sides of Shasta lifting blankets or piercing them so sleep was banished except from tbe mountaineers of tbe party.

At the dawu of daylight we were up and ehivering around a large fire while swallowing a forced breakfast, made barely eatable by a tin cup of delicious coffee. Then selecting alpenetocks from a store at hand, we started up the smooth hard snow beneath which rumbled aud ground an incipient glacier. Our course as indicated by the guide lay directly up the deep canyon of the hroad inclined valley on tbe southeast side. There was no dodging the smootb, forbidding, snowy steep by any zigzag approaches. Six thousand four hundred feet of vertical rise (over a mile and a quarter) must be made by about five miles upward grade. Does not that statement appal tbe reader? No wonder so few persons attempt to scale Shasta. Only about three dozen names are registered in the book prepared for the purpose and kept in a cairn of rocks near the monument.

A party, preceding us by a few days, failed to reach the top, tbough composed of stalwart hunters. Every season parties essay in vain to conquer Shasta. Ours was the first to succeed this year. Personally, I never bad euch difficulty in getting a foothold in climbing snow-clad peaks, or was so much affected by the rarity of the air. Every few rods I was obliged to drop down on my face and rest a few seconds, a proceeding soon adopted hy nearly all the party.

Arrived hy slow, toilsome labor to about the upper third of tbe down-swooping canyon, the steeper enow face, shaded from the morning sun, was found nearly as hard as ice. We bad to strike feet and pike repeatedly into the flinty slope, in order to make a half-inch ledge for tbe side of our nailed boots. Not a word was spoken. Questions as to direction, were asked of the guide, and answer returned by motions. Only the ring of iron-shod hoots and resonant pike, with the hard breathing of your nearest companion, was beard. The inclination was about 25 degrees only from the vertical. Dropping to the surface now to rest was impossible. We could only keep to tbe steep incline by carefully keeping one foot and the pike in place. Below, the cbasm yawued a full mile of threatening descent; above, a steeper mile stretched away to the sky.

And now I must make a humiliating confeseiou. Being no longer the athlete I was before Andersonville, I am uow no longer a daring cragsman and an undaunted mountaineer. Shasta has broken my spirit; from henceforth, he has substituted a contrary statement for my long-vaunted boast. Before fully aware of my condition, the guide called out, "Lemmon, you are giving out and pale as a ghost. Let me assist you." I feebly protested as I turned my course directly for a ledge of rocks at tbe right and distant about eight rods. But I could no longer make an indentation in the snow with my weak, trembling legs. My head, aching dreadfully for tbe last hour, now became dizzy and my eye-sight was uncertain. The brave-bearted, nohle-spirited guide (let me call hie name, Dick Hubbard) came alongside, cut with his hatchet notches in the ice for my feet, and, dizzy with exhaustion and frigbt, I tottered along to tbe splintered rocks and was saved.

Tbe rest of the climb—about two miles—had many nearly level sections in it of a few rods, and also many a steep declivity of ice and crumbling scoria, as difficult but not so dangerous as the part described.

By 2 P. M., we reached the bot springs in the old crater. These are still rumbling and spouting series of *solfatara*, the vestiges of the monster crater, a mile across, out of wbich pourcd a stream of lava that now overlies the plain for 100 miles around, but disintegrated and forming rich soil for one of the noblest pine forests in the State.

Lying on the interior heated rocke to rest, we learned from our guide how Jobn Muir and Jerome Fay passed a fearful night there in April of 1875, roasting and freezing alternately, an adventure whicb Muir subsequently so graphically portrayed iu *Harper's Magazine*. It appears that a change to cold and storm occurred in the night, the snow falling tbickly upon the adventurers, and melting by tbe warmth of the gas jets, with no pure heat to dry them off. Being short of food they were forced to return the next day though the terrific wind froze their garments stiff as sheet iron. Arrived at the base, they found their feet so frozen that hlisters formed all along the sides, and eventually they lost most of their toe-nails. Muir had to keep bis bed for a fortnigbt, but the time was not lost to the lovers of grand and graphic descriptions.

On the way up I was deeply interested in the different features presented by tbe noble old volcano of Lassen, distant southward 70 miles, but so distinctly seen as to seem only 20 miles away. He rests upon the eastern side of an alpine, snow-covered plateau, 20 miles across. With those daring friends, Case and Larsen, I had with great difficulty botanized the whole of that region, including tbe lofty Lassen. Now I was soaring 3,000 feet above the monument of that peak while the whole plateau lay unrolled at my feet.

Arrived at tbe summit of Sbasta, undoubtedly the most diversified and extensive landscape is presented that ever astonished human understanding. You eeem standing on a pedestal, rising out of the bottom of an immense, hollow hemisphere joining the equally extensive, overarching hemisphere of the sky by an irregular, waving line at the horizon. The optical illusion is perfect. You are not perched two miles above the general earth's surface, but only raised up to its level.

It is impossible for pen to picture the details of this landscape as we saw it on that clear, cool, still July day. Not a valley or plain, not even a uear canyon was obscured by smoke or dust. The whole anatomy of the many-ribbed Sierra Nevada, curving its vertebra to the sun in the southeast, was disclosed. Tbe many parallel coast ranges with white tipped spines rode rank on rank in the west. Between these monster skeletons reposed the yellow grain fields of the Sacramento valley. Eastward rolled wave on wave of noble forests, limited at last in the far horizon hy the peaks of the Warner range, shutting out the Great Basin of Nevada.

Northward this forest gives place to treelese plains, to interior, alkaline lakes and broad, fertile valleys. Of peaks tho list would embrace hundreds, including nameless snow drifts glinting ou the distant Oregon Cascades, 300 miles away, and the well-known St. Helena, Hamilton, Lola and Tahoe peaks as far away sontbward in central California.

A dense dark bank lying along the western horizon beyond the coast ranges, told wbere lay the cloud-forming Pacific. Was ever grander, clearer, more picturesque scenery vouchsafed to mortal gaze?

The physical features of Shasta—the immense, old, extinct volcano on wbicb we stand—are past description in one newspaper article, even if I had the ability. We can hut briefly examine its double crowns of unequal hights; gaze down into their broken-sided craters; smell, hear, feel and see tbe bot, sulphurous gasee still escaping from the bigbest crater; trace the out-cropping ribs of lava gaily striped witb red breccia, hlack mica, gray trachyte and brown scoria, extending from crater mouth down to timber line; follow the still living glaciers between, in their slow, majestic march down along the track of their mighty predecessors in the old ages, these glacier heds now appearing like the smooth trail of monster serpents as they form tbe peculiar curving, steep-sided river valleys entering and biding iu the dark, evergreen forest on all sides; we can see all these visions, then come away from Shasta bearing witb us glorious, ever-recurring, priceless memories forever.

The descent of Shasta is a speedy, and in our case, was a most enjoyable experience. Arriving at the top of the precipitous canyou, described on the way up, we prepared to slide down on the now softened snow, by passing a loop of baling-rope attacbed to a barley sack over our necks, allowing the sack to drop down in front, then sitting down upon the sack, for protectiou against injury to clotbes—aye, and flesh, too, perhaps, if certain rocks known to be near the surface around yonder bend should be exposed by this warm afternoou sun.

Sitting down on tbe edge of the precipice, then removing the pike from the snow, away we dropped one after the other, skurrying along and swaying from side to side, swiftly down the long canyon. At once, as soon as the leader plunged off the precipice, he set up a shout of joy, which was taken up by each follower in turn, and soon a graud chorus of yells and cheers resounded all along tbo line. There were several collisions and upsets, which were instantly rectified, and one sbarply-coutested race. Friends at tbe hotel, 10 miles away, happened at the moment to be looking for us with the aid of opera glasses, and they declare that we shot dowu the whole mile and a half in less than half a minute.

It was noon next day before all the Shasta pilgrims became visible around Mrs. Sissons' dining table, exhibiting nearly every degree of exhaustion, blindness and suffering. Each had a story of special adventure to relate, and of peculiarly ecstatic enjoyment experienced, but the expression most often beard—the one that met with unanimous concurrence—was: "I'll never be so foolish, again, *never!*" But, dear reader, we were tired then, and so, perhaps, are you.

A few days afterward, a gentleman connected with the United States Coast and Geodetic Survey, conducted on this coast by Prof. Davidson, arrived at Sissons' with several stage loads of equipments for ascending Shasta and establishing a signal station thereon.

Mr. Sissons employed several experienced guides and about 15 stout Indians to pack tho outfit up the peak, but their labor was to be much obviated hy making a new trail up one of the rock ridges, avoiding the snow. Hence, hereafter, touriets will find the ascent easily accomplished. And now, my aches gone, bruises healed and clothes mended, while the old, snow-mantled, cloud-veiled monarch looms up yonder, loftier and grander tban ever, because I know bim, I join my predecessors in advising every lover of nature, if they would "see all tbe world," to climb the lofty cone of old Shasta.

Sissons, July 20th, 1879.

Mining Along the Humboldt.

EDITORS PRESS:—From Wadsworth over the desert to the head of Humboldt sink, no discoveries of valuable mines have been made. But a few miles above thie eink, at Lovelocks, fair mines are spoken of to the south in the first mountain range, hut undeveloped, waiting for capital to work them. At Oreana, 12 miles more, are others of the same character. Ten miles more, at Rye Patch, other mines again appear only 12 miles south in the mountains, and have been worked, with good results, in a five-stamp mill, for some years, but are now shut down. Again, at Mill City, other mines appear, but entirely undeveloped, while from this point the very rich mines of Union City, 20 miles to the south, are reached. But 30 miles more, and one comes to Winnemucca, from which place, to the north 55 miles, at the head of Paradise valley, mines are worked, and are developing exceedingly rich. They are generally known as the Rose Mountain mines. They have but one mill running with 10 stamps, the Mount Rose, with Superintendent L. Rawlings, where the fine work done ensures the truth of the richness of the claims. Another mill, the Spring City, of 10 stamps, to be run mostly by water, is being built to begin work this fall—G. F. Williams, Superintendent. Tbe Mammoth claim is the one more fully opened than the others, yet this is down only 70 feet, with a clear, distinct vein widening gradually to over five feet, all good working ore, averaging $60 and $70 to the ton. Other claims are being opened nearly as favorably, with increasingly favorable prospects.

Some 8 or 10 miles west of these are the Willow Creek mines. There immense developments are asserted; too great to he fully credited at once ahroad, with true wide fissure veins, the largest of which is the Ethan Allen. Its tunnel is six and a half feet high hy four and a half wide, all in the regular wide vein, and assaying at an attempted average over $200 per ton.

Twenty miles south, on the west side of Paradise valley, Mr. I. R. Whittaker has discovered and opened a very promising claim, descending on a regular quartz vein over 60 feet, four and a half feet across, and assaying some $60 per ton. We could not visit all these mines, but from careful inquiry from different ones, as well as the owners, we believe these estimates below the truth.

Above Winnemucca 17 miles is Golconda, south of which, again a few miles, are different claims, the Harmony and others, which did promise well, but are lying idle for want of capital for their development.

Forty-five more and Battle Mountain is tbo depot for large and prospering mines. This is at the mouth of Reese River valley, on the east side of which, only 12 miles from the depot, at the foot of the mountain, are the Lewistown mines. The Starr and Grove, the Eagle and the Bettie O'Neil, are the principal ones; and, surely, on our carefully visiting their works and observing the clear, distinct and rich veios running into the sides of steep mountains, easily worked from tunnels, it did appear to us tbat tens of millions of dollars are here to be taken out. Tbe veins are miles iu length, and, most evidently, permanent. A fine town is here growing up.

On the west side of the valley, 18 miles from the depot, are the older mines of Galena, of whicb the White & Shiloh is the main one, opened and now very sucessfully worked under tbe euperintendency of C. L. Strong, well known in Virginia and San Francisco. The process is that of dry crusbing, bolting, roasting and leacbing the sulphurets, and is a perfect success. The roasting is doue in two of the largest revolving furnaces in the world.

Three miles south of Galena is probably the best worked copper mine on the coast; Superintendent, S. G. Truran. Tbe ore is selected, broken, washed, and shipped abroad for smelting. Sixty miles up Reese river are the immensely rich mines of Austin. Thirty-two miles east of Battle Mountain, on tbe Humboldt, is Beowawe, with some few mines of which we did not become well iuformed. Twenty more miles is Palisade, from wbich a narrow-gauge railroad runs south by Mineral Hill mines to Eureka, of which more hereafter. Tbirty-two more miles and one comes to Elko, a large, ratber dull town, a county seat and the site of the State University, conducted only as an academy at present. But from here, by the stage line of Mr. Van Drielin, we turned northwest 68 miles to the town and mining region of Tuscarora. It is on the north side of a fine valley, 12 miles by 30 in size, and has a view of the whole, commanding a sceno with the varied mountains around and beyond of unequaled splendor. But the mines of Tuscarora are its wonderful feature. The principal ones are the Argenta, the Grand Prize, the Independence, the Navajo, and the Belle Isle, with five or six others worthy of commendatory mention. We passed down the shaft of the first 500 feet and explored its different levels east and west hundreds of feet; then entered the Grand Prize by its connection witb the first, and descended another hundred feet and out along its levels everywhere, wondering at the large amount of excellent ore brought to view. Immense quantities are quarried and stored away for hoisting to the mill, as they secure hetter facilities for working it. Four claims have only oue 20-stamp mill for reducing the ore, but two other mills are bcing built.

The vein is distinctly bounded by walls, and varying in widtb from 6½ to 20 feet across, retaining all its richness as it descends. The whole vein may yield $30 to the ton, but the better portion is selected, yielding $70, $90, and over $100 the ton. From tbe Grand Prize, one rich gold-hearing slab was mined out in descending, wbich extended 30 feet deep, six feet wide, and from a tbin line to four or five inches in thickness, which assayed $105,000 to the ton, the whole heing nearly one-half gold.

The Independence is an excellent mine, with its fine 10-stamp mill. From this mine we saw most admirable specimens of wiry, or hairy masses of pure silver, and compact crystals of ruby silver and of stefanite. But all give the cbief praise at present to the Belle Isle, working tbrough the Navajo shaft and reduced in the Grand Prize mill. Its whole force of mining men is about 30, and its yield, as shipped, has been, the last month, first week, four days' work, $23,000; second week, five daye' work, $29,000; third week, six days, $39,000; fourth week, six days, $40,000. These were not results of accumulation, hut the simple week's regular work, and doubtless this general yield will be maintained for years, with regular milling facilities. We doubt if there is a more promising mining region in all northeastern Nevada than this Tuscarora. The population is perhaps 1,200, with a large proportion of families, generally American. The superintendents all appeared gentlemen, active and public spirited. The whole people appeared a wortby and intelligent community, as evinced by their being over 30 new subscribers for a publication of the real instructive cbaracter of the MINING AND SCIENTIFIC PRESS. We can well judge a community and each man by his treatment of an educative, scientific, useful paper like the PRESS. One who only wishes a daily for the news, and no more, or an Easteru paper because it is sharp, is not, we judge, a true American of soul aud mind. We need for our mines and our farms, publications like the SCIENTIFIC PRESS and the RURAL PRESS, and all intelligent men should appreciate them. S. V. B.

MECHANICAL PROGRESS.

ELECTRIC BLOWPIPE.—At a recent meeting of the Academy of Sciences, M. Jamin submitted a new electric burner, which he also recommended to chemists and physicists as a blowpipe. Two carbons are supported vertically abreast, hinged below, and drawn together at the top by a spring. A current is sent up one, down the other, then round a rectangular circuit inclosing the two, and passing first round the first one by current attraction the carbons are drawn apart, and the arc appears at the top and descends gradually, consuming one or both carbons. When the action of the rectangle is sufficient, the arc driven beyond the points is like a gas flame, and M. Jamin receives it on a piece of lime, magnesium or zirconium, getting intense light. It is also so hot as to fuse the lime. For the electric light this burner has considerable advantages, since it has no mechanism and requires no preliminary preparation beyond a support and the carbon points. The size of the flame is almost doubled and the light is augmented. The new foci are very powerful, and the quality of the light is far better, and the arrangement of the foci is more advantageous, the greatest quantity of light being directed downward, where it is wanted, instead of up into the air, where it is useless.

THIMBLE MANUFACTURE.—The process of making thimbles is described as follows: Bright new silver coins are reduced to ingots by melting in crucibles. They are then rolled into the required thickness and cut by a stamp into circular pieces of the required size. These circular disks are placed under a solid metal bar of the size of the inside of the intended thimble, which, moved by powerful machinery, descends in a bottomless mold of the size of the outside of the thimble, and presses the metal into the desired shape at a single blow. The remaining operations of brightening, polishing and decorating are performed by means of a lathe. First, the blank form is fitted with a rapidly revolving rod; a slight touch of a sharp chisel takes a thin shaving from the end; another does the same on the side, while a third rounds off the rim. The polishing is done by a round steel rod, which is dipped in oil and pressed upon the surface. Small revolving steel wheels, held against the revolving blank, pierce the indentations on the lower half and end of the thimble; the ornamentation is done by a similar process. All that remains to be done to the thimbles is to brighten and polish the insides, boil them in soap-suds to remove the oil, brush them up and pack them for the market.

BARREL CLEANING MACHINE.—A brewery at Monchain, in France, has been using for some time a patented machine for cleaning barrels. Four barrels are washed at once inside and outside. In the center of the machine is a shaft on which is a piece of metal so arranged that four iron hoops about three feet in diameter can be bolted on. These four hoops have each two sheet-iron plates mounted on pivots, and between these plates an attachment screw catches the barrels. Brushes fixed on springs are placed on a hoop outside the machine, and so arranged as to touch the four barrels at the same time. The circle of brushes is eccentric to the shaft. A reservoir under the machine has hot water for washing the outside of the barrels. A chain brush is placed in the interior of the barrel. The machine is worked by an ordinary pulley fixed on the main shaft. This latter carries the four barrels round, like the sails of windmill. The exterior brushes being stationary, produce a friction on the barrels which causes them to rotate on their pivots, so that two circular movements are obtained at the same time. The tables of the screws throw water on the barrels when they come to the upper part, so that they are continually kept wet.

ANTWERP EXHIBITION.—The *Iron Age* has received a copy of a circular issued by Mr. Stanislas H. Haine, of Antwerp, Belgium, giving information concerning the approaching international industrial exhibition at that place. Mr. A. Kaufman, 32 to 36 Park Place, New York, is authorized to accept and forward goods from this country, in the absence of any United States Commissioners, and will forward and return them free of cost, assuming personal responsibility for their sale or safe return. Heavy machinery or large and bulky exhibits will not be accepted on these terms, but all kinds of small articles adapted to the Belgian and neighboring European markets are desired, and can be exhibited with advantage. Mr. Kaufman will take much pleasure in giving such information as those who contemplate becoming exhibitors may desire. It is necessary, however, that immediate action should be taken, as only a short time now remains for forwarding exhibits.

SUPPRESSING THE INDUCTION DISTURBANCES IN A TELEPHONE CIRCUIT.—It is known that a secondary battery, composed of metal plates and sulphuric acid, allows weak currents to pass while stopping those of high tension. Prof. MacLeod therefore inserted a secondary battery of platinum plates between the line and the telephone, but this stopped both the induction and the vocal currents. When platinum wires were substituted for the plates, however, the induction currents were stopped, while the vocal currents could be feebly heard.

THE WERDERMANN ELECTRIC LIGHT.—A public exhibition of this new system of electric lighting took place lately at the Wharf and Girder Yard, of Messrs. Rowson, Drew & Co., Southwark. Nine lights in the same circuit were kept going by a Gramme dynamo-electric machine of the old type, driven by a Robey vertical engine and boiler. The light was very steady, notwithstanding the fact that the governor was disconnected from the engine. No shades or globes were used, except for one light in the office, and yet no unpleasant effect on the eyes was produced. The lamp consists of a hollow metal tube through which the carbon pencil is gradually fed up as consumed, being kept just short of contact with a carbon disc, the latter is balanced so as to fall down in case the pencil should not, from any cause, be fed up sufficiently to the disc. In this case, contact with the other pole, so that the current ceases to pass through that particular carbon, thus calling attention to the defect. Four inches of carbon are consumed in an hour, at a cost of 6d for 20 inches: and the nine lights only require 4½ horse power. In cost, therefore, the Werdermann light bears favorable comparison with other arrangements. The library at South Kensington Museum is now lighted on this system two nights out of the three a week that it is open; and Maj. Festing, R. E., the assistant director, expresses himself highly pleased with the result.—*Iron.*

ELECTRIC MOTOR.—Siemens & Halske, of Berlin, saye the London *Echo*, have supplied a real novelty to the exhibition held in that city. It is an electrical railway, with three carriages, capable of carrying 20 passengers. The road is about 220 yards long, and the train travels at the rate of 10 feet per second, about seven miles an hour. A steem engine drives a dynamo-electric machine, and the current produced is transmitted to another machine which works the train. Deprez is exhibiting a model of his motor at Lille, and at the forthcoming scientific exhibition in the Palaie de l'Industrie, at Paris, he will have a small train worked by a battery of 12 Bunsen cells. Possibly these are the beginnings of a great revolution, but we have a great deal to learn if that is ever to be brought about. Deprez hopes to be able to work an aerial propeller by his motor.

AUTOMATIC SPEED REGULATOR.—A contrivance has been invented by Messrs. Dufilhot & Duprat, of Bordeaux, for regulating the speed of machinery. It consists of a spindle to which rotary motion is imparted by the machine to which it is attached; on the spindle is fitted a sliding cone, and under the latter is a cross-head, bearing bent and counterpoised arms jointed thereon. When the spindle is revolved by the machine, the arms are thrown outwards at their lower extremities, but impinge upon the cone with their upper extremities, and by means of their varying friction on the cone, which increases with the velocity of the motion of the spindle, the speed of the latter is controlled, and its means and that of the machinery, with which it is connected by gearing-wheels.—*Universal Engineer.*

NEW REVERSING KEY.—Dr. O. J. Lodge exhibited his new reversing key for electrometer work, which is preferable to the ordinary forms, as giving a high insulation, small capacity, and not requiring the hand to approach close to it to work it. It consists of four platinum wires, arranged in pairs, crossing one another; one pair crossing between the other two. These are the terminale and contact pieces of the key. The middle pair are supported by an endless silk thread, which runs on two pulleys, one of which is fitted with a handle. On turning the handle to right or left, the two middle wires are brought into contact with one or other of the two outer wires, and the current reversed at will. The whole is inclosed in a metal box.—*Physical Society, London.*

SAILING ON THE RAILS.—The Sioux City (Iowa) *Journal* says: Mr. John McMillan, the enterprising roadmaster of the Sioux City and St. Paul railroad, came here a short time since with his hand-car rigged with canvas, sloop style. The experiment of sailing cars on railroads seems to be a new departure, and the success attending the trial was well marked. The car has been in use about two months, and gives perfect satisfaction, having made, with moderate breezes, upwards of 18 miles per hour, and with its "leg of mutton" sail can sail close up to the wind.

LARGE IRON MILL.—John Brinkerhoff erected an iron mill in Albany, N. Y., in 1807. The operations of the mill were confined to converting Russia and Swede bar iron into plates, which were slit into narrow strips and these cut to the required length and made into nails by hand. This was the origin of the present large works of the Albany and Rensselaer Iron and Steel Company, which now employs 2,000 hands and pays out $1,000,000 annually in wages.

NEW TYPE WRITER.—A new type-writing machine has been invented by Hansen, of Copenhagen. The aim of the inventor was to simplify the mechanism between the keys, which are pressed by the fingers, and the device which directly effects the imprint. The keyboard is abolished, and a semi-circular copper cap, over the circle of type-arms, made to do the work. By means of a rod, this cap connects with each arm with a single spring-push button.

SCIENTIFIC PROGRESS.

Iron into Fine Steel without Fusion.

Various processes are at present known for converting cast-iron into steel; those most in use being the Bessemer process, which consists in refining by contact with the oxygen of the air, and that known as Reaumur's process, which acts by means of reaction, and which has been greatly improved by Siemens, Pierre, Martin and others. Ingenious as all these processes are, none of them have yet yielded—nor can they ever yield—anything but imperfect results; the products in all cases consisting of compounds which are intermediate between true pig-iron, cast-iron and steel. For the purpose of getting rid of these defects, and of improving the quality of the metals, they are maintained for some hours at a red heat, in the middle of a mass of charcoal, over which is slowly passed a current of nitrogen, carbonic oxide, and various gaseous hydrocarburets. Wood, charcoal, peat, coke or any kind of vegetable matter, well dried and heated to a temperature of about 122° Fahr., is plunged into some hydrocarbon, such, for instance, as schist oil, which has been heated to the same temperature. Under these conditions, the liquid is absorbed by the carbonaceous substance in the proportion of from 12% to 15%. A pile is then formed of alternate layers of here of Bessemer metal, Martin iron or other product resulting from the refining of pig-iron, according to one or other of the processes above referred to; the whole is placed in the receiving apparatus, which consists of a kind of retort of any shape, heat being applied gradually until the iron reaches a red heat. By these means, the excess of oxygen contained in the vegetable substances forms an oxide of carbon, by combining with the vaporized hydrocarbon, and the nitrogen assists in the formation of ammonia, so that the metals are surrounded by the gaseous compound which is recognized as being the best for their conversion into finished steel or cementation steel.

PLAYING BALLS.—India-rubber has been very largely employed of late in the manufacture of playing balls. These are made either solid, inflated, or self-inflating, and are used for a variety of games. The majority of the solid india-rubber balls, until very recently, were manufactured in Germany, but an English firm having acquired the secret of their success, a very large portion of the trade has reverted to this country. All description of india-rubber balls, with the exception of foot-balls, are vulcanized in strong iron molds, cast in two sections, and turned perfectly true on the inside; a number of these molds, when the rubber has been inserted, are usually secured together by one pair of clamps. The secret of the German method of manufacturing solid india-rubber balls consists in rendering the interior of the rubber porous, while the outside is perfectly uniform and smooth. The object of this is not only to make the ball much lighter, but to make it appear more elastic, and thus impress the uninitiated with an idea that they are manufactured from a better quality of india-rubber than they actually are. To produce this effect, the following ingredients are mixed together: 20 lbs of African ball rubber; 11½ lbs red lead; 46 lbs vulcanized (best rubber) crumbs; 46 lbs vulcanized dark compound crumbs; 6 lbs salt, wet sawdust, or other substances capable of rendering the material porous by expansion when subjected to a high temperature. Total, 129½ lbs. The mixture is placed in crumbs in the molds, a solid wooden ball being used as a sort of kernel or center for each ball.

SILICIURET OF IRON.—The London *Engineer* reports that the French *Societe d'Encouragement* has undertaken to examine into the uses that can be made of the new compound, "siliciuret of iron." An ingot, weighing about 3 kilogs. (6.6 pounds) was sent to the Society by Prof. J. Lawrence Smith, having the following properties: Color, like platinum; specific gravity, 6.5; easily broken with the hammer; does not rust in the air; is not corroded by concentrated nitric acid, and is scarcely attacked by any reagents except fluohydric acid and by fusion with alkalies at a red heat. As a substitute for the rough-and-ready mode of testing iron and steel with the hammer, Mr. Hering proposes an electro-magnetic test. The pieces to be tested (wire, rods, bars, etc.) are passed through a magnetizing helix, when, if any break in the continuity of the fiber exists, the same may be detected by means of a magnetic needle suitably mounted on a block above the helix through which the test pieces are drawn.

DRAWING IN SCHOOLS.—The report of the judges on the school drawings lately exhibited at Boston, from various towns of the State, says that there is no feature of the exhibition this year so pronounced as the "systematic educational treatment of drawing in public schools, to make it useful as a preparation for the practical duties of life, as well as to employ it as an implement of education whereby knowledge of other studies may be acquired, rather than to consider it as an ornamental study only, of little practical importance. It is a triumph for drawing as an elementary branch of education, that all mere picture-making has been abolished, and a thing of work having industrial aims and means substituted for the thing of play that drawing used to be."

UTILIZATION OF EXHAUST STEAM.—According to the invention of Mr. N. W. Ericson, of Stockholm, he lets steam of higher pressure, or higher temperature, or both higher pressure and temperature than the pressure or temperature, or both, of the steam which is to be used in a steam-engine or for any other purpose, pass into an apparatus for the suction and compression of elastic fluids, in order that the said higher or stronger steam may in such apparatus act as the suction fluid to the said spent steam; this suction and compression apparatus is further connected with the apparatus wherein steam is to be used in order that the spent steam may to a greater or less extent be drawn into the suction and compression apparatus when the acting or higher steam passes through it. The mixture of the acting or drawing steam and the spent steam passes through the delivery pipe of the suction and compression apparatus (and its continuation, as required) either to the place where the thus compressed steam is to be used, or else first through an apparatus containing saturated steam, or water, or in so near connection with water that the steam if in a superheated state becomes more or less saturated or lowered in temperature, or else into an apparatus wherein the steem, by cooling, is rendered liquid, and the heat thereby given out is used for generation of fresh steam. This later apparatus may be the steam boiler in which the acting superheated steam is generated, or another steam boiler or vessel. The suction and compression apparatus may be any suitable section and compression apparatus, such as an annular or other jet apparatus.

SPONTANEOUS GENERATION.—Another contribution to the spontaneous generation controversy, favoring the germ theory, has just been published by Prof. Tyndall, in a paper to the Royal Society. He reports that he took with him to the Alps during the past summer one hundred flasks of infusions, 50 of turnip and 50 of cucumber, that had been prepared in the laboratory of the Royal Institution, and carefully sealed. Of these 20 were broken in transportation, and were found to be swarming organisms. Another lot was opened in an atmosphere in which saw-dust had been shaken up, and was soon turbid with organisms; others were found to be infected by the proximity of a cascade of water derived from melting snow; while others that were opened in the pure air of the mountains were found to remain clear and uninfected. These results of Prof. Tyndall are entirely confirmatory of his previous experiments and announcements, in which he has always taken strong ground against the hypothesis of spontaneous generation advocated by Bastian and others, and has maintained the view that the origin of the swarms of organisms that make their appearance in decomposable animal or vegetable matter must be explained upon the supposition of infection from without, through the direct instrumentality of the air bearing the germ of these organisms in contact with the medium suited for their development. Tyndall, in the paper above referred to, places himself again on record as an opponent of spontaneous or non-parental generation.

ARTIFICIAL FUEL.—The invention of Mr. O. Hassel, of Heidelberg, Germany, consists of the manufacture of artificial fuel in the form of bricks or blocks out of peat, coal dust and other combustible materials in combination with sea-grass, sea-weed, sea-fan, or similar vegetable substances, and in combination with a coating of pitch or other suitable material. One or more of the above-named vegetable substances is or are boiled in water to a jelly, which is then carefully mixed with the combustible material in a powdered state that has to be formed into artificial fuel until a pasty mass is obtained. The mixture is compressed in molds of suitable size into bricks, which are dried in the open air. After the bricks have sufficiently hardened the same are furnished with a coating of pitch or other suitable material to form a strong protecting surface against atmospheric influence.

DEVELOPMENT OF MINING INDUSTRY IN SPAIN.—A Franco-Spanish Company, the *Societe Generale de Industrie Minerale*, has lately been formed for giving an impetus to mining enterprise in the Spanish Peninsula. They inspect and report upon mines, furnish various ores with a correct analysis (by arrangement with the School of Mines), and certificate of origin, and represent manufacturers of mining plant, which they push in various ways. Besides having a staff of agents in the principal towns, they have lately opened a permanent exhibition at Cuinta de Goya, Madrid, where the machines of English, French, Belgian and German makers are to be seen at work. The managing director is M. Ludovic Denis de Lagarde, who has lately resumed his office of consulting engineer to the French Embassy in Spain.

A NEW PROCESS OF GLAZING.—A new process of glazing has been introduced by which putty may be altogether dispensed with. Vulcanite is the substance that is to take the place of the old material. The window sashes under the new system are to be so arranged that the glass may be fixed into the grooves prepared for it, and, coming into contact with a strip of vulcanite attached to the frame, the glazing is complete. Any unskilled workman can fix the glass, and, when fixed, there is no putty to perish under the action of the atmosphere.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending July 17.		Week Ending July 24		Week Ending July 31		Week Ending Aug. 7.	
Alpha	26¾	25½	25½	21	25½	19	25½	20
Alta	11	8¾	8½	6½	7⅞	6½	7⅞	6½
Andes	1.20	1	1.05	60c	1	80c	1.30	90c
Alps	....	....	....	....	....	....	....	....
Argenta	1.05	90c	1.65	1.30	1¼	1	1¼	1.05
Atlantic	35c	....	....	....	....	....	....	....
Aurora Tunnel	50c	20c	50c	40c	50c	....	25c	....
Baltimore Con	....	....	....	....	....	....	....	....
Belcher	5⅜	4.90	5	3.80	4.30	3.95	4.90	4.10
Belmont	50c	40c	40c	....	40c	30c	70c	40c
Best & Belcher	18	16¾	17¾	15½	17⅞	16	19	16½
Bullion	6⅞	6⅜	6¼	4.80	5⅜	3.95	6⅞	5¼
Bechtel	1.95	1.60	1.80	1¼	1.60	1¼	1.40	1¼
Belle Isle	2.90	2½	4.80	3¼	4.40	3¾	4¼	3½
Bodie	20½	18½	17¾	11¼	14	11	13½	11¾
Benton	7¼	6¼	5¼	4	4½	3¾	4.70	3.80
Bulwer	8½	8	9	6¾	9	8¼	9½	8¾
Boyle	....	....	....	....	....	....	....	....
Black Hawk	1.70	1	1½	1	95c	75c	1.55	1.35
Belvidere	2¼	1.10	1.10	90c	1	95c	1	85c
Booker	1⅛	85c	1.10	95c	90c	50c	1½	1.05
Caledonia	2.40	2.05	2.35	2.05	2.20	2	2½	2.05
California	4.90	4¾	4.95	4.60	4.95	4¾	5¼	4.80
Challenge	2.60	2	2.40	2.10	2½	2.15	2¾	2¼
Chollar	7¼	6	7	6	6⅞	5¾	7¼	6
Confidence	11¼	10½	11	10½	11	10	12¾	10¾
Con Imperial	1¼	1½	1.65	1¼	1.40	1.15	1.60	1¼
Con Virginia	4.85	4.65	4.80	4.60	4.70	4.60	5⅜	4.60
Crown Point	5¼	4.90	5	4	4.40	4	5¼	4.40
Con Washoe	....	....	....	....	....	....	....	....
Champion	80c	55c	90c	50c	70c	50c	55c	50c
Concordia	....	....	15c	....	....	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	20c	15c	20c	15c	15c	....	....	....
Daney	....	....	....	....	....	....	2½	....
Day	30c	20c	20c	....	20c	15c	15c	....
Eureka Con	16½	15½	16	15	15	14¾	15	14½
Exchequer	7	6¼	6	5	5⅜	5	6½	5½
Endowment	45c	35c	45c	40c	....	....	40c	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	4	3½	3.90	3⅝	3¾	3.60	3¾	3.55
Gila	1.10	1	1¼	1.05	1¼	1⅛	1.40	1.20
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	13¾	....	13¾	....	14	13	13	12½
Goodshaw	50c	40c	50c	40c	40c	25c	40c	30c
Gould & Curry	10⅞	10½	10	8	9¼	8¼	11¼	8⅞
Hale & Norcross	15¼	12½	14¾	11¼	13	10¾	15¼	11⅝
Hillside	1¼	1½	1¼	....	....	....	1½	....
Highbridge	25c	20c	20c	....	20c	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	25c	15c	20c	15c	15c	....	20c	15c
Independence	2.55	2.30	2.45	1.80	2.15	1.10	3	2.30
Julia	3⅞	3½	3.60	3.05	2.95	2.55	3.10	2½
Justice	5½	4½	5¼	4.15	4.20	3.60	4.10	3.60
Jackson	4¼	4	4	....	3¾	....	4	3½
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	4.60	4.10	4.30	4	4½	3.90	5½	4
Kossuth	....	....	15c	....	20c	10c	25c	20c
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	1.20	90c	1	75c	1.30	95c	1.15	1
Lady Wash	2	1¾	1.70	1¼	1.40	1.15	1½	1⅛
Leopard	1.60	1	1.60	1.20	1.40	1	1.15	1
Leviathan	65c	55c	55c	40c	40c	30c	40c	30c
Leeds	80c	70c	75c	....	75c	....	75c	70c
Lee	....	....	....	....	....	....	....	....
May Belle	40c	30c	40c	....	30c	....	....	....
Modoc	....	....	1	....	1	....	1	90c
Manhattan	3.10	2¾	2¾	2¼	2¼	2	2¼	2
Martin White	6	5⅜	6	5¼	6	5¼	4	3½
McClinton	1½	1¼	1.30	1	1⅛	1	1.10	1
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	26¾	23	25¾	21	24¾	20¼	33¾	21½
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	....	....
North Con Virginia	9¼	9	9¼	9	9¼	9	9⅛	9
New York	75c	60c	60c	40c	50c	40c	40c	35c
Northern Belle	5	4	4.95	4¾	4.40	4.15	4.40	4
New Coso	....	....	....	....	....	....	....	....
Navajo	45c	40c	50c	40c	40c	35c	30c	....
Occidental	1	85c	1	90c	90c	80c	1.05	90c
Ophir	37	31	36½	30¼	32½	29¾	36¼	30½
Oriental	25c	20c	15c	10c	45c	10c	50c	25c
Overman	10¼	9	9¼	8¼	9¼	8	10¾	8¼
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	....	....	2¾	....
Phil Sheridan	....	....	....	....	45c	....	80c	35c
Potosi	5	4¾	4.95	4.15	4½	4.05	5⅜	4.05
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	4.10	3.90	4	3	4	3.90	3¾	2½
Richer	90c	60c	75c	50c	55c	50c	45c	25c
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	14⅞	12½	14	11½	12	10⅜	13¾	10¾
Seg Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	42½	38½	42	31½	40½	31½	51½	37
Silver Hill	1.70	1½	1.60	1¼	1½	1¼	1.40	1¼
Silver King	7½	7	7½	6¾	6¾	6½	6¼	6
Silver Prize	15c	....	25c	20c	20c	....	20c	....
Succor	15c	10c	15c	10c	15c	....	....	....
Summit	2½	2.10	2.35	1.40	2.05	1¾	1.90	1¾
Scorpion	2.10	1.70	1.80	1½	1.90	1½	3	1.95
Solid Silver	35c	20c	30c	20c	25c	....	....	....
South Bodie	40c	30c	30c	15c	25c	15c	20c	15c
South Standard	25c	20c	20c	15c	20c	15c	20c	....
Star	75c	50c	60c	45c	....	....	55c	50c
St. Louis	....	....	....	....	....	....	....	....
Syndicate	8	7½	7	5	6	5½	6¾	6
Tioga Con	5⅝	4.60	4½	3¼	4	3.10	4½	3.10
Tiptop	80c	75c	90c	75c	1	75c	1.10	95c
Trojan	....	....	10c	5c	10c	5c	25c	5c
Union Con	38	36½	37	29	35	26½	57	27½
Utah	16¼	17¼	17½	13½	16¾	14	20	14¾
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.40	1¼	1.40	1⅛	1.40	1.05	2	1
Wells-Fargo	....	....	....	....	....	....	20c	15c
Woodville	50c	40c	50c	40c	50c	35c	50c	45c
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	15½	14¾	15	12½	16½	14¼	19¾	15¾

Sales at S. F. Stock Exchange.

Friday A. M., Aug. 1.

360 Alta 6⅞@6⅝
60 Alpha 20
450 Andes 90c@1
100 Belcher 4.10@4.20
390 Best & Belcher 16¾@16½
160 Bullion 5¼
145 Benton 3.90@3.85
195 California 4.80
75 Con Virginia 4.60@4¾
480 Con Imperial 1.30@1¼
20 Chollar 6½@6¼
690 Crown Point 4.40@4½
250 C Dorado 1.85
60 Challenge 2¼@2.35
80 Caledonia 2.10
200 Exchequer 5¼@5⅜
200 Flowery 50c
30 Gould & Curry 8⅞
425 Hale & Nor 12@11⅝
270 Justice 3¾@3.95
205 Julia 2.60@2½
210 Kentuck 4
100 Kossuth 20c
500 Lady Bryan 1@1.05
120 Lady Wash 1¼
20 Leviathan 30c
300 Mexican 21½
150 Mackey 1.15
45 North Con Vir 9
325 New York 40@35c
375 N Bonanza 1.40@1½
215 Ophir 30¾@30½
20 Overman 8@8⅛
150 Occidental 90c
130 Potosi 4.20
730 Sierra Nevada 37
275 Savage 10⅞@10¾
100 Silver Hill 1¼
250 Scorpion 1.95@2
460 Trojan 5c
185 Utah 14¾@15
735 Union Con 29@27½
450 Woodville 50@45c
925 Ward 1@1.05
345 Yellow Jacket 15¾

AFTERNOON SESSION.

975 Argenta 1.10@1.05
100 Albion 20c
550 Adenda 30@25c
1395 Belle Isle 3.60@3¾
300 Belmont 40c
120 Bodie 11¾
960 Booker 1.20@1.05
110 Black Hawk 1.45
540 Bechtel 1¼
100 Belvidere 90c
60 Bulwer 8¾@9
915 Champion 50c
950 Crœsus 20c
145 C Pacific 6@6½
50 D Standard 90c
565 Defiance 95c
665 Dudley 1¼
105 Eureka Con 14¾@15
200 Fourth July 60c
115 Grand Prize 3.65
80 Goodshaw 40c
40 Glory 1.15
100 Golden Terra 13
210 Gila 1.30@1.40
1205 Indepeudence 2.40@2.30
10 Jackson 3¾
170 Jupiter 2
300 Leopard 1
80 Manhattan 2.10
120 Mono 7¾
520 Martin White 4
10 McClinton 1.05
15 Mammoth 11½
750 N Belle Is 35c
150 Noonday 3¼
370 N Noonday 2¾
425 Orient 40@50c
280 Queen Bee 65c
150 Richer 45c
360 S Standard 20c
145 Syndicate 6
25 Standard 30
300 Silver Prize 20c
350 S Bodie 20@15c
110 Silver King 6½@6
215 Summit 1.80@1¾
100 S Bulwer 65c
650 Tioga Con 3.10@3.20
150 Vortex 70c
80 Wales 4½

Saturday A. M., Aug. 2.

30 Alpha 20@20½
450 Andes 90c@1
105 Alta 6⅞@6¾
900 Argenta 1.15@1.10
400 Adenda 50c
150 Belcher 4¼
170 Bullion 5¼
280 Benton 3.85@3.80
35 Best & Belcher 16⅞@17
290 Belmont 65@55c
990 Belle Isle 4@3.95
900 Bodie 12@11¾
5 Belvidere 1
250 Bulwer 9
320 Black Hawk 1.35@1.40
1175 Booker 1.40@1¼
390 Champion 50c
350 California 4.90@4.95
650 Con Virginia 4.85@4.60
50 Chollar 6⅞@6
200 Caledonia (BH) 2¼
180 Crown Point 4.40
1600 Con Imperial 1¼
130 Confidence 10¾
50 Challenge 2.40
75 Caledonia 2.05
350 C Dorado 1.90
175 C Pacific 6½
70 Dudley 1½
200 Exchequer 5¼
30 Eureka Con 15
50 Endowment 40c
350 Flowery 45@50c
280 Gould & Curry 9@8⅞
20 Grand Prize 3¾
305 Goodshaw 30@40c
30 Glory 1.20
100 Golden Terra 12½
75 H & Norcross 12
320 Independence 2.40@2.45
205 Justice 3.90@3.80
250 Julia 2.55@2½
20 Jackson 3½
100 Kentuck 4
200 Kossuth 25c
120 L Wash 1¼@1.20
300 L Bryan 1.05@1
100 Leviathan 35c
1200 Leopard 1.05@1
35 Leeds 70c
50 M White 4
100 Mammoth 11½@11¼
395 Mexican 22¾@23
220 Mackey 1.20@1¼
110 Manhattan 2¼@2.10
60 Mono 7¾
100 New York 35c
125 North Con Vir 9
160 N Bonauza 1½
20 Northern Belle 4.30
250 Navajo 30c
50 Noonday 3½
700 N Noonday 2¾@2½
65 Overman 8½@8¾
350 Occidental 1
135 Ophir 31½@32
230 Potosi 4.05@4.15
100 Paradise 1.65
200 Red Cloud 35@40c
100 Rustler 70c
150 Summit 1.60@1.85
90 Syndicate 6¼
80 Savage 11
825 Sierra Nevada 38½@39¾
150 Silver Hill 1.30@1¼
320 Scorpion 2.65@2.90
1400 S Utah 5c
20 S Potosi 85c
950 Tioga Con 3.40@3¾
50 Utah 15⅞@15½
540 Union Con 31½@32
550 University 40c
100 Vortex 70c
550 Woodville 50c
320 Ward 1½
740 Yellow Jacket 16¼@16

Monday A. M., Aug. 4.

20 Alpha 21½
1075 Andes 1
485 Alta 7
440 Bullion 5⅞@5½
470 Belcher 4½@4.60
345 Best & Belcher 18
345 Benton 4.10@4
240 California 4.95@5
4175 Con Imperial 1.40@1.35
760 Crown Point 4½@4¾
530 Confideuce 11½@11¾
300 C Dorado 1.90
100 Challenge 2¾
230 Caledonia 2.20@2.45
290 Con Virginia 4.90@4.85
185 Chollar 6½@6¾
490 Exchequer 5½@5¼
600 Flowery 70@75c
855 Gould & Curry 9½@9¾
455 Hale & Nor 13¾
245 Justice 3.70
415 Julia 2¾@2.70
85 Kentuck 4.15
400 Kossuth 25c
600 Lady Bryan 1.15
670 Lady Wash 1¼@1.20
1430 Mexican 27@26¾
100 Mount View 2.60@2½
250 Mackey 1¼
640 N Bonanza 1.65@1.85
100 New York 35c
25 N Con Virginia 9
165 Overman 9
575 Ophir 35@35¾
280 Occidental 1
300 Phil Sheridan 35c
50 Potosi 4.30
430 Savage 12¾@12
1095 Sierra Nevada 48½@47
635 Scorpion 2.90@3
265 Silver Hill 1¼@1.30
2000 S Utah 5c
260 Utah 17@16¾
1420 Union Con 38@39¾
170 Ward 1½
705 Yellow Jacket 16¾@17

AFTERNOON SESSION.

590 Argenta 1.15
100 Adenda 55@60c
505 Albion 20@30c
600 Belmont 70c
760 Booker 1.45@1½
365 Black Hawk 1.35@1.40
50 Belvidere 95c
120 Bulwer 9@9½
235 Bodie 13½
350 Bechtel 1¼
595 Belle Isle 4¼@4.10
300 Champion 55c
100 Caledonia (B H) 2½
100 Crœsus 20c
500 C Pacific 7@6¾
300 Day 15c
230 Dudley 1.55@1½
50 Defiance 90c
65 Eureka Con 14¾@15
30 Glory 1.20
220 Grand Prize 3.60@3.55
325 Gila 1.30@1.40
200 Goodshaw 35c
250 Hamburg 40c
100 Hillside 1¼
1560 Independence 2½@2.60
30 Jackson 3¾
350 Jupiter 2
85 Leeds 75c
1430 Leopard 1.05@1¼
495 M White 3¾
210 Mono 7¾@7½
490 Mammoth 11½@11¾
100 Modoc 1
775 N Belle Is 45@40c
90 Northern Belle 4¼@4
60 Noonday 3.60@3¾
175 N Noonday 2.85@3
1450 Orient 25@20c
300 Oriental 40c
100 Paradise 1¾
250 Phenix 2¼
300 Queen Bee 60@65c
700 Richer 25@30c
90 Raymond & Ely 2½@2¼
100 Rustler 60c
250 Red Cloud 40c
40 Summit 1.90@1⅞
80 Syndicate 6½@6¾
500 S Bodie 20c
1000 S Bulwer 60@70c
680 Tioga Con 3.80@3.90
180 University 40c
100 Vortex 70c

Tuesday A. M., Aug. 5.

75 Alpha 22
120 Alta 7½@7⅞
335 Andes 1@1.10
450 Bullion 5⅛@5½
670 Belcher 4¾@4.80
370 Best & Belcher 18@17¾
310 Benton 4¼@4½
300 Con Dorado 1.90
835 California 4.95@5
180 Con Virginia 4.95@5
735 Crown Point 4¾@5
1050 Con Imperial 1.40
105 Confidence 12
245 Chollar 6⅞@6¾
100 Challenge 2.60@2½
190 Caledonia 2.40
470 Exchequer 5⅝@5½
1460 Flowery 70@80c
275 Gould & Curry 9½@9¾
550 H & Norcross 13¾@13½
330 Justice 3.95@4
225 Julia 2.80@2.90
180 Kentuck 4.40@5
175 Kossuth 25c
840 Lady Wash 1.45@1.30
520 L Bryan 1.15
505 Mexican 26¾@27
680 Mackey 1.30@1.40
885 N Bonanza 1.80@1.95
80 North Con Vir 9
900 New York 35c
55 Overman 9½@9¼
630 Ophir 34½@33¾
195 Occidental 1
350 Phil Sheridan 65@50c
140 Potosi 4½@4.40
200 Silver Hill 1⅜@1.30
395 Savage 12¾@12
460 Scorpion 2.80@2.90
650 S Utah 5c
685 Sierra Nevada 46@47
80 Utah 17¼
815 Union Con 45@45¼
1200 Ward 1.60@2
100 Wells-Fargo 20c
150 Woodville 50c
1265 Yellow Jacket 18@18¾

AFTERNOON SESSION.

500 Addenda 50@55c
400 Albion 15c
690 Argenta 1.15@1¼
1205 B Chief 50c
1580 Booker 1.35@1¼
1300 Black Hawk 1½@1.45
1890 Belle Isle 3¾@3.80
195 Belvidere 90@85c
100 Belmont 65c
330 Bulwer 9½@9¾
220 Bodie 13@12¾
430 Bechtel 1.30@1.40
350 Champion 50@55c
30 Caledonia (B H) 2½
95 C Pacific 7@6¾
125 Dudley 1½@1.40
30 Defiance 60c
120 Eureka Con 14¾
30 Glory 1.20
110 Grand Prize 3.60
300 Goodshaw 30c
1005 Gila 1.30
175 Hussey 20c
175 Hillsido 1½
100 Hamburg 40c
600 Independence 2¾@3
70 Jackson 3.90@4
250 Jupiter 2.20@2¼
1570 Leopard 1.10@1
50 Leeds 70c
200 Manhattan 2.10
400 Martin White 3½
130 Mammoth 11¾
360 Mono 8
370 McClinton 1.10@1
50 Mt Diablo 4½
2420 N Belle Is 50c
230 Noonday 3¾
1100 N Noonday 3.10@3
200 Northern Belle 4¼@4.40
500 Oriental 45@50c
3550 Orient 20@25c
600 Paradise 1.65@1.60
200 Queen Bee 55c
50 Raymond & Ely 3½
100 Richer 45c
500 Red Cloud 50c
125 Summit 1.85
700 Silver Prize 20c
210 Star 55c
1525 S Bulwer 70@65c
1200 S Bodie 20@15c
230 Syndicate 6¾
170 Tiptop 95c@1
375 Tioga 4.20@4.10
100 University 45c

Wed'sday A. M., Aug. 6.

320 Alpha 25@25½
480 Alta 7½@7
950 Andes 1.15@1¼
1305 Bullion 6⅞@6½
520 Belcher 4.90@4.70
720 Best & Belcher 19@16½
895 Beuton 4.70@4½
550 Con Dorado 1.85
24 0 Con Imperial 1.60@1.55
485 Crown Point 5@5½
50 Confidence 12¾
1910 Con Virginia 4.95@5
820 Chollar 7½
430 California 4.95@5
230 Challenge 2.70@2¾
340 Caledonia 2.40@2½
520 Exchequer 6½
2750 Flowery 1@1.10
705 Gould & Curry 11@11½
585 Hale & Nor 15¼@14¾
520 Julia 3.10
470 Justice 4.05@4.10
270 Kentuck 5½@5¼
370 Leviathan 30@40c
1195 Lady Wash 1.45@1½
650 Lady Bryan 1.15
1525 Mexican 32¾@33¾
570 Mackey 1.35
100 Mountain View 2.60
100 North Con Vir 9
2200 N Bonanza 2.10@1.90
880 New York 40c
265 Overman 10½@10¾
700 Ophir 35½@36¼
140 Occidental 1
2250 Phil Sheridan 75@80c
380 Potosi 5@5⅜
400 Peytona 1
150 Silver Hill 1⅜@1.40
830 Sierra Nevada 51@51½
1170 Scorpiou 3@2.90
790 Savage 13¾@13⅞
100 Senator 25c
1000 S Utah 5@10c
100 Trojan 25c
1190 Union Con 54@57
460 Utah 19¾@20
400 Wells Fargo 15c
450 Ward 1.85@1.60
200 Woodville 50c
925 Yellow Jacket 19¾@16¾

AFTERNOON SESSION.

675 Albion 15c
190 Aurora T 25c
1090 Addenda 50c
1045 Argenta 1.15@1¼
855 Belmont 70c
220 Black Hawk 1¼@1.55
470 Booker 1.35@1.30
995 Bodie 11
1170 Belle Isle 3¾@3.70
60 Bechtel 1.35@1.40
275 Bulwer 9½@9¼
1800 B Chief 50c
1250 Champion 50c
200 Crœsus 20c
130 C Pacific 7@6¾
100 Caledoma (B H) 2¼
20 Defiance 80c
350 Day 15c
280 Dudley 1½
160 Eureka Con 14¾@14½
300 Golden Terra 13
700 Goodshaw 30@35c
100 Glory 60c
110 Grand Prize 3¾
1250 Gila 1.30@1.20
600 Hussey 15c
20 Hillside 1½
380 Independence 2.90@3
730 Jupiter 2@2.10
350 Jackson 4
315 Leeds 70c
1970 Leopard 1.10@1.15
600 Martin White 3½@4
60 Mono 7
130 McClinton 1
825 Manhattan 2
435 Mammoth 11¾@11½
70 Modoc 90c
50 Mt Diablo 4
2250 N Belle Is 50@55c
200 Northern Belle 4@4.10
1350 Noonday 3¾@3.90
2250 N Noonday 3@3¼
150 Oriental 35@25c
600 Orient 30@25c
50 Phenix 2¾
830 Paradise 1.85@1.90
100 Queen Bee 60@65c
200 Richer 45c
100 Raymond & E 3½
600 Red Cloud 50c
50 Real del Monte 2½
500 Silver Prize 20c
900 S Bulwer 75@70c
170 Summit 1.90@1.80
500 Star 50@55c
180 Syndicate 6@6½
630 Tioga Con 4½
400 Tiptop 1.10@1
1150 University 45@40c
23 0 Vortex 65@55c
170 Wales 4¾

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Amazon Con M Co	Nevada	6	10	Mar 24	June 11	Aug 29	Jno Crockett	12 Cosmopolitan Hotel
Belcher S M Co	Nevada	19	1 00	July 21	Aug 26	Sept 16	Jno Crockett	203 Bush st
Belmont M Co	Nevada	21	30	July 1	Aug 7	Sept 2	J W Pew	310 Pine st
Belvidere M Co	California	4	25	July 9	Aug 11	Sept 6	O V Hubbard	203 Bush st
Booker Con G M Co	California	3	50	June 30	Aug 4	Aug 25	W H Lent	309 Montgomery st
Brilliant M Co	Nevada	4	10	July 18	Aug 18	Sept 3	H S Stone	419 California st
Bullion M Co	Nevada	10	1 50	July 9	Aug 13	Sept 3	J Gruss	418 California st
Champion M Co	Nevada		25	July 26	Aug 31	Sep 30	G C Hurlbut	525 Commercial st
Commonwealth Con M Co	Nevada	1	25	June 27	July 11	Aug 30	C A Morse	217 Sansome st
Eagle S M Co	Nevada	14	10	Aug 4	Sept 10	Sept 30	J E Byrne	533 Kearney st
Exchequer M Co	Nevada	14	1 50	July 9	Aug 15	Sept 5	J Gruss	418 California st
Gold Deposit G & S M Co	California	1	25	July 25	Aug 28	Sept 16	J M Buffington	209 California st
Goodshaw M Co	California	4	25	July 9	Aug 23	Sept 30	V Fernbach	327 Pine st
Gould & Curry S M Co	Nevada	36	1 00	July 10	Aug 14	Sept 3	Alfred K Durbrow	309 Montg'y st
Julia Con M Co	Nevada	9	1 25	July 8	Aug 13	Sept 4	H A Charles	419 California st
Jupiter M Co	California	4	25	July 5	Aug 11	Sept 4	E C Masten	22 Nevada Block
K K Con M Co	Nevada	—	1 00	Aug 1	Sept 3	Oct 1	B B Minor	309 Montgomery st
Manhattan S M Co	Nevada	13	1 00	July 16	Aug 21	Sept 12	Jno Crockett	203 Bush st
McCrackin Con M Co	Arizona	3	25	July 29	Aug 29	Sept 17	H Aug Whiting	211 Sansome st
Mexican G & S M Co	Nevada	7	2 00	July 11	Aug 14	Sept 4	C L McCoy	203 Bush st
N Noonday M Co	California	2	25	June 5	July 14	Aug 18	G A Holden	310 Pine st
New York M Co	Nevada	19	40	July 8	Aug 9	Aug 29	D L Thomas	203 Bush st
Original Keystone S M Co	Nevada	2	25	July 28	Sept 1	Sept 28	F E Luty	330 Pine st
Real Del Monte M Co	Nevada	7	1 00	June 10	July 19	Aug 11	C V D Hubbard	203 Bush st
Savage M Co	Nevada	38	1 00	July 8	Aug 11	Aug 30	E B Holmes	309 Montgomery st
Silver Hill M Co	Nevada	7	50	July 10	Aug 14	Sept 4	W E Dean	203 Bush st
South Bodie G M Co	California	1	25	July 18	Aug 25	Sept 17	H Deas	309 Montgomery st
South Bulwer	California	4	15	July 16	Aug 20	Sept 12	Wm Stuart	320 Sansome st
Star M Co	Nevada	2	20	June 3	July 15	Aug 11	———	320 Sansome st
Tellurian G & S M Co	California	19	10	Aug 1	Sept 1	Sept 24	J M Litchfield	415 Montgomery st
Trojan M Co	Nevada	11	25	July 14	Aug 18	Sept 8	David Wilder	328 Montgomery st
Tuscarora M & M Co	Nevada	4	10	Aug 2	Sept 6	Sept 30	M E Sperling	309 California st
Union Con S M Co	Nevada	14	2 00	July 31	Sept 4	Sept 23	J M Buffington	309 California st
Ward G & S M Co	Nevada	4	50	July 2	Aug 7	Aug 27	J Stadtfeldt, Jr	26 Haywards Build
William Penn	Nevada	5	05	July 12	Aug 13	Aug 30	O J Humphrey	328 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Addenda G & S M Co	California	1	20	July 2	Aug 7	Aug 28	T H Dixon	238 Montgomery st
Armand G & S M Co	California	1	10	June 9	July 28	Aug 25	J L Fields	240 Montgomery st
Black Hawk G M Co	California	6	50	July 1	Aug 4	Aug 25	H A Charles	21 Haywards Build
Crœsus G & S M Co	California	1	05	June 16	July 21	Aug 14	E Hestres	328 Montgomery st
Curtis Con M Co	Nevada	1	10	July 11	Aug 11	Aug 30	H S Stone	419 California st
Dudley M Co	California	4	25	June 12	July 16	Aug 11	E C Masten	22 Nevada Block
Fall Creek M Co	California	3	40	June 11	July 22	Aug 14	C Robinson	310 Pine st
Giant and Old Abe M Co	California	1	50	June 4	July 15	Aug 14	———	49 Nevada Block
Gover M & M Co	California	38	50	May 21	July 1	Aug 11	W O Wilson	402 Front st
Hartford S M Co	California	1	50	June 18	July 21	Aug 13	S Heringhi	422 Montgomery st
Leo M Co	Nevada	5	50	June 14	July 18	Aug 8	J J Scovillo	59 Nevada Block
Mayflower Grav M Co	California	5	10	June 17	July 22	Aug 23	J Morizio	328 Montgomery st
Mono G M Co	California	4	50	June 21	July 28	Aug 18	W H Lent	309 Montgomery st
Numa M Co	Nevada	1	03	June 13	July 24	Aug 11	D Wilder	328 Montgomery st
Oriental Con G & S M Co	California	3	25	June 25	July 25	Aug 11	H C Hinman	411 California st
Oro M Co	California	2	05	———	Aug 4	Aug 23	Wm Stuart	320 Sansome st
Queen Bee M Co	California	4	10	July 10	Aug 30	Sept 2	T A White	113 Leidesdorff st
Rustler G M Co	California	1	10	June 30	Aug 4	Aug 18	A F Main	309 California st
San Pedro G & S M Co	California	2	05	July 29	Aug 29	Sept 15	T A White	113 Leidesdorff st
Seg Europa M Co	Nevada	1	25	Apr 4	July 31	Aug 18	R B Noyes	240 Montgomery st
Sherwood Con M Co	Nevada	1	25	July 12	Aug 12	Aug 30	H S Stone	419 California st
Swansea M Co	California	1	10	June 14	Aug 4	Aug 25	F N Delaney	315 California st
Richer M Co	California	3	25	July 30	Sept 3	Sept 28	W H Lent	309 Montgomery st
Wide Awake M & P Co	Arizona	7	02	June 23	Aug 1	Sept 1	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Alta S M Co	Nevada	Wm H Watson	302 Montgomery st	Annual	Aug 21
Calabasas L & M Co	Arizona	F A McGee	Merchants' Exchange	Annual	Aug 12
Comstock G & S M Co	Nevada	J M Buffington	309 California st	Annual	Aug 18
Crœsus G & S M Co		E Hestris	328 Montgomery st	Annual	Aug 18
DeHaro M Co	——	W W Bausman	409 California st	Annual	Aug 13
Europa M Co	Nevada	J L Fields	240 Montgomery st	Annual	Aug 14
George Douglass M Co		W W Bausman	409 California st	Annual	Aug 14
Independence M Co	Nevada	Jno E Dixon	327 Pine st	Annual	Aug 18
Julia Con M Co	Nevada	H A Charles	419 California st	Annual	Aug 13
Lucky Rocky G M Co	———	Chas Healy	Merchants Exchange	Annual	Aug 16
Mount Hood M Co	———	W W Bransman	409 California st	Annual	Aug 21
Navajo M Co	Nevada	J E Dixon	Stock Exchange	Annual	Aug 12
Rocky Point M Co	California	T L Bibbins	314 Bush st	Annual	Aug 18
S Comstock Con S M Co	Nevada	J M Buffington	309 California st	Annual	Aug 18
Sabine M Co	———	W W Bransman	409 California st	Annual	Aug 21
Swiss M Co	———	A Sarboro	521 Washington st	Annual	Aug 22
Seg Europa M Co	Nevada	J L Fields	240 Montgomery st	Annual	Aug 15
South Comstock G & S M Co	Nevada	J M Buffington	309 California st	Annual	Aug 18
Star M Co	Nevada	Wm Stuart	302 Sansome st	Annual	Aug 25
Tolo M Co	——	W W Bausman	409 California st	Annual	Aug 14
Vancouver M Co	——	W W Bausman	409 California st	Annual	Aug 13

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Argenta M Co	Nevada	J E Dixon	Stock Exchange	20	July 25
Belle Isle M Co	Nevada	John E Dixon	Stock Exchange	50	Aug 5
Bodie Con M Co	California	W H Lent	Nevada Block	1 00	Aug 1
California M Co	Nevada	C P Gordon	23 Nevada Block	50	June 17
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	50	June 16
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	1 00	July 21
Indepeudence M Co	Nevada	John E Dixon	Stock Exchange	25	July 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	July 26
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	30	July 28

SALES OF LAST WEEK AND THIS COMPARED

Thursd'y A.M., July 31.

130 Alpha 20@25½
395 Alta 6¾@6⅞
850 Andes 90@95c
410 Belcher 3.95@4
475 Benton 4@3.95
340 Bullion 5¾@5½
185 B & Belcher 16¾@16½
260 Caledonia 2.05@2.10
90 California 4.80@4¾
10 Con Virginia 4.60
50 Chollar 6½@6¾
130 Crown Point 4.40
1210 Con Imperial 1¼@1.30
150 Confidence 11@10¾
235 Challenge 2¼@2.40
250 Con Dorado 1.80
450 Exchequer 5½@5⅝
200 Flowery 50c
30 Gould & Curry 8⅞@8¾
505 Hale & Nor 12@12¼
80 Justice 4
315 Julia 2.65
40 Kentuck 3.90
200 Kossuth 20c
880 Lady Bryan 1.10@1¼
675 Lady Wash 1.20@1¼
400 Leviathan 30c
1005 Mexican 22¾@22
950 Mackey 1.15
210 North Con Vir 9½@9¼
440 N Bonanza 1.40@1.45
750 Ophir 32@32½
55 Overman 9@9¼
175 Occidental 90@85c
320 Potosi 4¼@4½
430 Savage 11
835 Sierra Nevada 39@40½
250 Silvor Hill 1.20@1.15
100 S Utah 10c
140 Scorpiou 1.90
100 Solid Silvor 25c
95 Utah 16½@16¾
1300 Union 35@33¼
640 Woodville 50c
425 Ward 1
515 Yellow Jacket 15½@15¼

AFTERNOON SESSION.

300 Albion 20c
175 Addenda 30@25c
1340 Argenta 1@90c
380 Bulwer 8½@8¼
920 Black Hawk 90@85c
80 Belvidere 1@95c
1435 Belle Isle 3.65@3.60
530 Bodie 12¼@12½
880 Bechtel 1¼@1.30
1715 Booker 1@1.10
200 Crœsus 20c
365 Con Pacific 6¾@6½
1100 Caledonia (B H) 2½@2
675 Champion 50c
430 Dudley 1¼
155 Defiance 1
410 Grand Prize 3¾@3.60
300 Goodshaw 35c
220 Golden Terra 12
1485 Gila 1¼@1.30
100 Hillside 1½
615 Independence 2
870 Jupiter 2@1.95
100 Leopard 1
150 Leeds 75@70c
580 M White 5@4¾
190 Mammoth 11½
330 Mono 7¼
150 Mt Diablo 5@4¼
100 Modoc 1
680 McClinton 1.10@1
305 Manhattan 2@2¼
145 Northern Belle 4¼
200 Navajo 30c
950 N Belle Is 35c
250 Noonday 3½
400 N Noonday 2¾
800 Orient 35@45c
500 Oriental 35c
390 Paradise 1¾@1.60
350 Queen Bee 65c
200 Red Cloud 45c
70 Raymond & E 3.90@3.80
40 Rustler 70c
300 Silver Prize 20c
335 S Bulwer 70c
50 Syndicate 5⅞
400 S Bodie 20c

Thursday A. M., Aug. 7.

590 Alta 6½@6¾
40 Alpha 24@24½
900 Andes 1¼@1.30
130 Best & Belcher 18@17½
535 Belcher 4.60@4.55
180 Bullion 6¼@6⅞
180 Bentou 4.35@4¼
75 California 5½@5¼
145 Chollar 7
330 Con Virginia 5¼@5⅜
395 Crown Point 4¾@4.65
625 Con Imperial 1.45@1½
385 Caledonia 2.40
80 Challenge 2½
350 C Dorado 1¾
100 Daney 2½
275 Exchequer 6¼@6½
3200 Flowery 75@50c
670 Gould & Curry 9¾@9½
340 Hale & Nor 13½@13¾
970 Justice 3.80@3.60
625 Julia 2.80@2.95
325 Kentuck 5@5¼
260 L Bryau 1@1.05
200 Leviathan 35c
350 Lady Wash 1¼@1.30
1000 Mexicau 29½@28¾
1230 Mackey 1.35@1½
1845 New York 35@40c
150 N Con Vir 9¼
1410 N Bonanza 1.60@1¾
130 Ophir 33½@33¾
145 Overman 10@9¾
220 Occidental 1.05
260 Potosi 4¾@4.80
1820 Phil Sheridan 70@50c
660 Savage 12@11¾
1545 Sierra Nevada 44@46½
655 Silver Hill 1¼@1.20
500 Senator 25c
490 Scorpion 2.40@2½
800 S Utah 5c
85 Utah 17½@18
815 Uniou Con 51½@53
640 Woodville 50c
2300 Wells-Fargo 50c
110 Ward 1.65@1.70
310 Yellow Jacket 17¼@17½

AFTERNOON SESSION.

1830 Argenta 1¼@1.20
350 Albiou 15c
500 Addenda 50c
1000 B Chief 55c
125 Belvidere 90c
230 Booker 1¼@1.40
50 Black Hawk 1.60
550 Belle Isle 3¾@3.70
285 Bodie 11@10¾
30 Bechtel 1½
200 Belmont 90c@1
340 Champion 50@40c
200 Caledonia (B H) 2½
160 C Pacific 7@6¾
600 Crœsus 25c
600 Day 15@10c
50 Dudley 1½
115 Eureka Con 14½
20 Glory 1.10
275 Grand Prize 3.90
520 Gila 1.30@1¼
350 Goodshaw 25c
20 Hillside 1.40
1720 Independence 2.40@2.45
45 Jackson 4¼
550 Leopard 1.05@1
45 Mammoth 11½
415 Mono 7@7¼
270 Martin White 3¾@3.95
300 McClinton 90c
50 Modoc 90c
105 Mt Diablo 4¼@4½
1200 N Belle Is 55@50c
5 N Noonday 3.10
475 Northern Belle 4
900 Orient 30c
1300 Oriental 40@35c
1510 Paradiso 2
1400 Queen Bee 60@65c
75 Raymond & Ely 3½
50 Real del Monte 2½
250 Rustler 50c
200 Richer 35c
200 Red Cloud 50c
50 Star 50c
55 Silver King 6¼
545 S Bulwer 75@70c
200 S Standard 10c
150 S Bodie 15c
340 Summit 2
560 Syndicate 6@5⅞
590 Tioga Con 4.10@4

90 Silver King	6½@6	100 Tuscarora	5c
25 Tiptop	65c	130 Tiptop	1
205 Tioga Con	3.10@3.20	450 University	40c
250 Vortex	75c@70c	2835 Vortex	55@60c
140 Wales	4	155 Wales	4

Pacific Board—Latest Sales.

Wed'sday A. M., Aug. 6.		AFTERNOON SESSION.	
100 Andes	1.15@1.20	40 Alta	7
110 Alta	7@7	10 Andes	1
20 Bullion	62@62	70 Bullion	4@4
30 Best & Belcher	18@19	100 Bodie	10
10 Bodie	11	80 Belcher	4.95@4.65
910 Belcher	5@4	40 Bullion	6.30
370 Benton	4@4	160 Con Virginia	5
30 Chollar	7@7	450 Con Imperial	1.55@1
450 Con Imperial	1.55@1.60	30 Exchequer	6
100 California	4.95	450 Flowery	50c
30 Con Virginia	5@5	10 Gould & Curry	10
70 Crown Point	5@5	90 Hale & Nor	13@13
170 Gould & Curry	10@11	90 Julia	3@3
130 Hale & Nor	15@14	30 Justice	3.85@3
110 Justice	4@4	3.0 Leopard	1.10@1.05
85 Julia	3@3.15	200 Manhattan	2@1.95
120 Mexican	32@32	125 Mexican	33@30
100 N Bonanza	2	100 M White	3
50 New York	40c	200 N Standard	2
80 Overman	11@10	405 Ophir Co	3@3
145 Ophir	36	40 Ophir	34
130 Potosi	5@5	460 S Utah	5c
120 Savage	13@13	30 Sierra Nevada	49@48
60 S Nevada	51@53	25 Silver Hill	1.50@1
50 Silver Hill	1.40	50 Trojan	7c
50 Union	53@56	10 Utah	19
10 Utah	20	20 Union Con	54
50 Ward	1.90	100 Wells-Fargo	20c
145 Yellow Jacket	19@19	5 Yellow Jacket	18

California Board—Latest Sales.

Wed'sday A. M., Aug. 6.		AFTERNOON SESSION.	
30 Alpha	24	30 Yellow Jacket	19
40 Alta	7@7	30 Alpha	24
50 Ætna (N)	8	30 Alta	7@7
30 Belcher	5	30 Arcenta	1
40 Best & Belcher	19	125 Ætna (N)	3
40 Bullion	6@6	125 Atlanta	1c
40 California	5	75 Ætna (A)	20c
90 Con Virginia	5@5	325 Atlas	15c
200 Con Imperial	1	200 Almaden Q	2
30 Crown Point	5	40 Best & Belcher	17@17
50 Chollar	7	40 Bullion	6@6
130 Challenge	2	45 California	5
200 Caledonia	2	200 Con Imperial	1
40 Exchequer	6@6	40 Crown Point	5.10
30 Gould & Curry	10	35 Challenge	2.70
40 Hale & Nor	15	150 Caledonia	2 40
30 Julia	3	300 Con Washoe	35c
40 Justice	4.10	500 Gono Con	5c
1200 Leo	65@55c	45 Exchequer	6
30 Mexican	32	500 Enterprise	1
160 Mint	7c	40 Gould & Curry	10@10
200 Monumental	3c	100 Gila	1
300 N Sierra Nevada	3c	20 Hale & Nor	14
100 N Union	45c	100 Hussey	16c
140 New York	40c	80 Julia	3.10@3
250 North Carson	1c	90 Justice	4@4.05
20 Ophir	36	300 Leo	55c
2800 Orient	21c	30 Mexican	32
20 Potosi	4.80	200 Mint	70@8c
30 Savage	13	100 N Sierra Nevada	6c
30 Sierra Nevada	5	300 North Carson	1c
20 Silver Hill	1.40	40 Ophir	34
200 S Utah	10c	30 Sierra Nevada	49@49
200 Silver Prize	20c	100 Succor	13c
200 Trojan	7c	130 S Utah	5c
20 Union Con	54@54	40 Union Con	33@53
100 Wm Penn	10c	40 Yellow Jacket	18@18

The Mining Share Market.

Without what may be termed a "booming" market, the past has been a satisfactory week to dealers in mining shares. After a season of depression, with sales slow and limited in extent, the market gained animation and strength at the very end of the week. Monday came and with it an incisive, sudden and unexpected upheaval, the north end stocks being especially buoyant. Chippers in hastened to realize, this being the first opportunity that had offered for a long time to make a profit, while short sellers, alarmed at the prospect, lost no time in filling outstanding obligations, a combination of movements that served to keep life in the market for several days after. Indeed the week closes with great activity and a cheery outlook. On Wednesday there was a lively call at advanced figures for Comstock shares, the demand reaching to nearly every standard stock from Utah to Silver Hill. As there have been but few Eastern orders since the June collapse, these purchases must have been mostly on home account, disclosing a growing confidence among local operators in this class of securities. But how to interpret these movements it would be difficult to say. The stock manipulator, like the oarsman, looks one way when he pulls the other. Stocks may be put up on their merits, through improvements occurring in mines or through the efforts of insiders who, having discovered the worthlessness of the mines, may be desirous of getting out. The Comstock sphynx sits in the Washoe deserts, mysterious and dumb, a puzzle to all save the keepers of the oracles themselves. Outside worshipers are at a loss to know whether it is coming or vanishing—a stern reality or only a myth. There is evidently a growing belief that important developments are about to transpire at more than one point along the great ore channel. What serves to strengthen this impression is the close personal attention that Mackay and Fair are just now giving to operations there. These men are not apt to devote themselves individually to this sort of work, unless some important ore revealments are expected and even imminent. At any rate, this is the construction put upon their constant presence in the lower levels of certain mines of late. Then, too, the knowing ones are generally beginning to stand in to the support of the old favorites, which also seems significant of the early approach of the good time coming. We trust it will not this time prove a failure, nor be much longer delayed. At the very end of the week the Comstocks, with one or two exceptions, closed stiff, while Bodie and other outside stocks were a little off. This class of mines are, however, generally looking well, and with the opening of new ore bodies, their shares would quickly respond in higher prices.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

ITEMS.—*Dispatch*, Aug. 2: The Gray Eagle mine is being thoroughly prospected. Five stamps of the Empire mill are being run on rock taken from the mine as a test. The Victoria mine, south of the Empire, is also being prospected by San Francisco capitalists.

DOWNS.—*Ledger*, Aug. 2: The new double-compartment shaft is down 200 ft, and connection made with the old shaft. Ventilation is now good. In the Lincoln, running drifts by contract system is the work in hand. The mill is running. The Potosi, between Amador City and Plymouth, is inactive, with the exception of keeping down the water. The Maryland continues to work a small force of men.

BUTTE.

BANNER MINE.—*Mercury*, Aug. 1: C. W. Keeney, Superintendent of the Banner mine, went to San Francisco Wednesday, taking with him 33 pounds of quartz gathered from the old tunnel run by McSmith and Sparks in '59. Old prospectors and miners who saw the rock, estimate its value at $130 a ton on the dump.

CALAVERAS.

CONGO QUARTZ MINE.—*Chronicle*, Aug. 2: This mine is situated in Negro gulch, near Leavitt's ranch. The main shaft has reached a depth of 100 ft. The ledge, which showed very wide on the surface and was somewhat broken up, has narrowed down to a solid, well-defined vein four ft thick, all carrying gold. Good judges estimate that the ore will average $30 per ton, taking the entire ledge as it comes.

CHAMPION.—An immense over-shot wheel is to be built to run the hoisting gear, and the erection of a 20-stamp battery is to be commenced immediately. The Champion is looking better than at any other period in its history, and the mine has now been thoroughly prospected to the depth of 500 ft.

EL DORADO.

ITEM.—*Democrat*, Aug. 2: Last Thursday the St. Lawrence mill and mining company closed a sale of their fine 30-stamp quartz mill and hoisting works to the Placerville gold quartz (the old "Pacific") mining company. This is the finest and most complete quartz mill property ever put up in this county. It will be at once removed to the mining ground of the purchasers, on Pacific hill, just south of this city.

MONO.

TIOGA DISTRICT.—*News*, Aug. 2: Tioga district is situated about four miles north from Mount Dana, and adjoins the south line of the Bodie mining district, and in a direct line is 25 miles distant. There are now some 40 mines taken up, principal among which are the Atherton, opened by a cut now in about 20 ft, uncovering a ledge 15 ft in width, which assays well; the Ahwaga, with a shaft sunk some 25 ft, following down on the ledge from the surface, looking well; the Bevan, on which work has been done by means of a shaft now 18 ft in depth, showing a ledge extending the entire width of the shaft, about 10 ft; the Tiposaid, on which no work has been done beyond stripping the ledge cropping out on the surface, which can be traced 1,500 ft in length; the Highrock, adjoining those mentioned above on the west, has a shaft down 22 ft, following a footwall, and in ledge matter, assays from which run from $40 to $200 per ton, mostly in silver; the Industry adjoins the Bevan on the east, and shows fine, large croppings. The formation of the country is porphyry, mixed with quartzite, which is inclosed between well-defined walls of granite, seeming to form a barrier to the outside rock. There can be traced from camp, with the naked eye, a well-defined mineral belt extending north a distance of over two miles, and south one and one-half miles.

LUCKY RODGE.—*Standard*, Aug. 1: This mine is on Peak hill, a short distance below and parallel with the Bechtel and McClinton. The ground includes 100x1500 ft, embracing, in addition to the Lucky Rodge, the Kinkead and the Minnie veins. The shaft has been sunk to a distance of 60 ft on the Lucky Rodge, and a drift has been run 12 or 15 ft north from the bottom. The ledge is narrow, but is rich throughout. Extensive works are to be put up on this claim.

STANDARD CON.—*Standard*, Aug. 4: The west drift, 385 level, is in 300 ft. The ore is good. In the stopes the ledge is from 7 to 15 ft wide, of very fine ore. The winze in the west crosscut, 550 level (incline), is down 47 ft. The upraise on this ledge to connect with the north drift, new shaft, is up 56 ft. The ledge is eight ft wide, of good ore. In the West Standard they are stoping on a ledge 10 ft wide, of very rich ore. They are also stoping in the south drift, 550 level, where the ledge is eight ft wide, of good milling ore, and in the Gildea stopes the ledge is three ft wide.

RED CLOUD CON.—The east crosscut, 400 level, was extended 12 ft further during last week, and a ledge was cut, into which has now been cut 12 inches. The ore assays from $15 to $30 per ton. A progress of 12 ft was also made in the west crosscut, same level. On the Packard and Morton vein, from this crosscut, a drift has been started south, which is now in a few ft, and has run under a shoot of ore of very good quality, assays from which go $55 per ton.

DUDLEY.—The north drift from these workings is now in 167 ft, and the south drift 110 ft.

NOONDAY AND NORTH NOONDAY.—The north drift on the 200 level has been extended 12 ft during the past week; total length of drift, 327 ft. The combination shaft is now down 215 ft; progress during past week, 15 ft. A station has been cut out during the past week on the 212 level, and a crosscut run west from the station 14 ft.

DEFIANCE.—The shaft has attained a depth of 190 ft, and, following the footwall of the ledge, the bottom is all in quartz. Heretofore the quartz has been found more on the hanging wall, and it has been found by crosscutting. It now appears to have widened out to the full extent of the fissure.

SUMMIT.—The north drift, 200 level, has been advanced since last report nine ft; total length, 310 ft. The ledge is 18 inches wide. The east crosscut from this drift is in 194 ft; progress during the week, 18 ft. The rock is somewhat softer than it has been since starting. The north drift, 300 level, is in 204 ft; progress during the week, 18 ft. The ledge is three ft wide, and looks well. The south drift, same level, has been extended during the week 25 ft; total length, 215 ft. The ledge is two and one-half ft wide.

BODIE CON.—The south drift, first level, is now in 136 ft. The south drift, second level, is in 118 ft. The east crosscut, third level, is in 304 ft. The west crosscut, third level, is in 140 ft.

BULWER CON.—The south drift, 380 level, has been advanced since last report 15 ft; total length 131 ft. The ledge is two ft wide of good ore.

BLACKHAWK.—The winze from the 320 level is down 120 ft on the Warren vein, and the ledge shows an improvement. The drift north on the same vein is in 135 ft, and the face looks well. The east crosscut, same level, is in 150 ft, the rock being very hard, with occasional seams of clay.

SOUTH BULWER.—Work in this mine is now confined to the 350 level, where drifts are being run on the ledge and winze No. 2 is being sunk. The latter is now down 30 ft, where the ledge is looking well.

BOOKER CON.—An average progress of about 15 ft per week is being made in sinking the shaft. It is now down 378 ft, the ground being very wet and working easily.

UNIVERSITY.—The new three-compartment shaft is now down 44 ft, timbered the entire distance with 8x8 timbers. A ledge is coming in on the west side the whole length of the shaft.

DOUBLE STANDARD.—The west crosscut has been run since last report 15 ft, total length, 46 ft. The ground is somewhat harder. The east crosscut is now in 40 ft; progress since last report, 11 ft. The ground is hard blasting porphyry.

RICHER.—The east crosscut, 200 level, is now in 150 ft, and the formation is of a favorable character. The west crosscut, same level, is in 80 ft.

NEVADA.

MOHICAN.—*Transcript*, Aug. 1: The Mohican quartz mine, at the head of Gold flat, has been leased to a company of practical miners. The miners were formerly driven out by the water, but the work done in the Thomas mine has furnished it with thorough drainage. The ledge in sight is large and shows well.

ITEMS.—*Foothill Tidings*, Aug. 2: At the Chavanne shaft of the Rocky Bar mine two companies of tributers are at work on the 300 level, and the rock is said to be looking very well. A contract has been let for sinking the shaft to a depth of 80 ft below the 300 level, at which point the drain drift through to the New York hill ground will be started. A contract for running 50 ft on this drift has also been let, and the work started on the New York hill ground. Rube Thomas has discontinued hydraulicing in his claim on the "Slide" for the season, as the V flume requires all of their surplus water to supply the town reservoirs. He will do some work during the summer by drifting in the gravel. The ore now being extracted from the Murchie mine looks better than ever before. It is very heavily charged with sulphurets. They have eight Frue concentrators running and save several tons of sulphurets daily. The Shamrock mining company is pushing the erection of the new hoisting works. In the meanwhile the new shaft is being sunk to water level. The Surprise Con. mine, near Allison ranch, contains two locations embracing 2,500 linear ft—one of 1,000, the other of 1,500 ft—the first supposed to be the old Illinois ledge, the other the extension of the Hartery. The locations have been consolidated, and a company formed and incorporated under the above name. The principal place of business is in Grass Valley, and the stock is owned mostly by four persons, who are practical working miners. The company have sunk a shaft on the Hartery ledge to the depth of 92 ft, which is 8 ft in the clear, has two compartments, is well timbered, and is intended for a permanent working shaft. At this shaft there has been excellent pumping and hoisting machinery put in place, and inclosed by a good substantial building, 54 by 33 ft in size. The engine is 24-horse power, the boiler tubular, of 40-inch diameter, and 20 ft in length. The pump in the shaft is 8-inch. The ledge in the bottom of the shaft is about 22 inches in thickness, carrying a good footwall and the hanging wall improving. The ledge shows well in free gold and sulphurets, and it is believed that the quartz taken out of shaft will pay for the sinking of the same. Mr. Seth Brown has recently been prospecting in the region north of Truckee, and reports that outlook very flattering. He picked up one piece of gold worth $15.

PLACER.

ITEMS.—*Herald*, Aug. 2: On the old Shipley lead, about three miles west of Ophir, four practical miners, the Hawkins Bros. and two others, who have been prospecting in that vicinity for some time, have recently made a strike that promises to prove of importance. In a shaft which they have sunk about 30 ft deep, they have a ledge from 18 to 20 inches thick, the ore from which prospects from $18 to $20 per ton. They propose to fit up, and crush their rock in the old Shipley quartz mill. The "Rainbow" drift mine, a few miles above the Hidden Treasure, is panning out fully as rich as any mine in the county. They have a breast of over 40 ft, and the gravel pays not less than $20 per day to the man.

DUTCH FLAT.—*Forum*, July 31: The Polar Star mine has yielded some very rich nuggets within the last three weeks, so says rumor. The last clean-upmade by it, after a nine days run, was over $7,000. It cleans up again today.

SHASTA.

FRENCH GULCH.—Reading *Independent*, July 31: F. W. Wheeler is pounding out $50 per day with a hand mortar. The Frank ledge is taking out every day a large quantity of rich quartz from the Niagara. The old Scorpion ledge is turning out some ore. There are four men working on the Sparta ledge, near Slick Rock, running an arastra with fair success. Mr. Heaton says that he and Vandeveer are getting out some good rock from the old Swasey & Dunlap quartz ledge on Middle creek. They have run their tunnel in about 150 ft. The Extra company, at Copper City, are working on some very rich decomposed quartz from Bully hill. Rich placer diggings are also being worked in the same locality. Mr. Cannon a short time ago took out $2,000 or $3,000 out of a quarter acre of ground. Mr. Potter has his new quartz mill on the ground at Spring creek, and will begin to crush ore immediately.

SIERRA.

WILBOURN CON.—*Messenger*, Aug. 2: Work has again been commenced on the Wilbourn Con. mining company's ground, the location of which is about three miles south of Gold lake, what is known as Thompson's ridge, on the same range as the rich diggings recently discovered above Sierra City. The company will put down a shaft in this granite to sufficient depth and then run a drift to strike the channel. A shaft was sunk on the ground two years ago, and the finest of gravel was obtained.

TUOLUMNE.

ITEMS.—*Independent*, Aug. 2: About 100 pounds of quartz ores were shown us to-day, taken from the "Spring Gulch mine," which equals anything in the way of mill rock which we have ever seen in this county. This was sprinkled with gold all through, some of which was very coarse. The portion of the vein from which this ore was extracted was from 5 to 8 ft wide. Near the "Spring Gulch mine" is the "Hunter Con." This has recently had the addition of a new 10-stamp mill, and has recently struck a rich body of ore. The "Starr King" has resumed operations, under the superintendency of Mr. Floyd, and a rich strike of ore has been made in it. The "Soulsby," "Confidence" and other mines are turning out steady and enormous yields. At Oroveland a mine near Quartz gulch, Big Oak flat, has struck good paying rock at three different places along the ledge, which is quite large, and some of the rock is very rich indeed, being covered all over with specks and threads of beautiful yellow gold. It is usually pounded out with a mortar, and besides there has been saved up a considerable quantity of milling ore; some of which shows gold, in about every piece, and will pay over $100 per ton. The gulch, which runs along side of this vein, has been one of the richest in California. Mr. McCortea has just completed a cut and tunnel from near the gulch to the vein, about 70 ft, where he has struck rock that prospects very well; has not yet cut through the vein, which, at this place lays quite flat, with a general dip to the eastward towards the gulch. There is a singular phenomena connected with this mine. At the point where the tunnel strikes the vein there is a crevice through which a strong current of fresh, cool air comes up from below, with force enough to blow out a candle when held near it. This current of air is quite cold and pure, and by holding the ear close to the crevice, a soft, musical sound can be heard, like the murmuring of distant waters. Mr. McCortea is also the owner of another mine, on the west side of Big Oak flat, known as the Slate Gulch mine; from several parts of which he has taken good ore while opening the mine, both by shafts and tunnels, and has generally succeeded in making it pay its way. This mine is now bonded to Conde and Savery for $3,000. It was near this mine that McCortea found $380 in gold dust, on the surface near the trail, all in a bunch, about two years ago.

NEVADA.

WASHOE DISTRICT.

NORTH BONANZA AND FLOWERY.—Gold Hill *News*, Aug. 6: Sinking the main shaft is making fair progress. The north drift, 400 level, is nearing the vein and will cut into it diagonally during the coming week. The Flowery crosscut, 300 level, is in a very promising formation o quartz, assaying well.

UNION CON.—Two and a half ft per day are being added to the east drift, 1000 level; total length from the main north drift, 152 ft.

OPHIR.—A joint Mexican crosscut has been started on the 2000 level in search of the west wall and to prospect the ground in that direction. The joint Mexican winze from the 2100 level is making two ft per day, through blasting porphyry carrying some water. The drift north on this level is averaging four ft per day, through a harder formation of vein porphyry; total length, 82 ft. The incline is now 140 ft on the slope below the 2300 station, and continues in a fine vein formation with streaks of quartz.

CALIFORNIA.—The face of the joint west crosscut, 850 level, is in harder rock than formerly and is encountering some water; total length, 532 ft. On the 1950 level the winze from the north end of the ore stopes is down 20 ft in vein material carrying quartz in streaks.

ALTA.—A raise is being made from the 1450 to the 1350 level, in ore, to connect the ore bodies on the two levels, preparatory to stoping out.

MEXICAN.—A crosscut joint with Ophir has been started west on the 2000 level, which is making two ft per day, and will be driven with all speed toward the west wall of the vein.

GOULD & CURRY.—Three ft per day are being added to the length of crosscut No. 3, 1700 level; total length from the main lateral drift north, 1,063 ft, the face in clay and porphyry.

OCCIDENTAL.—The lower tunnel has been enlarged and repaired throughout, and from a point 2,434 ft from the mouth a winze has been sunk on the dip of the ledge 110 ft in perpendicular depth, and from a point 100 ft down a crosscut run west 96 ft through a well-defined vein of low-grade ore.

NEW YORK.—The crosscut on the 1200 level has passed 100 ft through favorable vein matter and is now in the clay and cast easing of the vein.

CON. VIRGINIA.—On the 850 level the joint west crosscut is averaging two ft per day through hard rock carrying some water. The raise from the south drift, 1500 level, is up 25 ft and passing through low-grade ore. On the 1650 level, winze No. 2 will be reached some time this week. East crosscut, 2150 level; is in harder rock than formerly, the face 90 ft from the main south drift.

JULIA CON.—The winze from the 1800 level is down 110 ft, and the bottom is in a promising formation of quartz.

OVERMAN.—A drift has been started north on the 1900 level, from the bottom of the winze from the 1600 level, to connect with that south on the 2100 level of the Belcher.

CON. IMPERIAL.—The north drift, 2000 level, is in 555 ft, and passing through quartz and porphyry.

LEVIATHAN.—On the 750 level the south lateral drift is pushing ahead in easy blasting rock with occasional streaks of quartz. The north lateral drift, on the same level, shows less quartz; material in face, hard ledge porphyry.

CALEDONIA.—The winze from the 1000 level has attained a depth of 258 ft, the bottom in hard rock carrying considerable water.

LADY BRYAN.—The north and south drifts, 600 level, and crosscuts from them are all in promising quartz, but of low grade.

TROJAN.—The upraise from the east drift, third level, is in low-grade quartz.

WARD.—The shaft has attained a depth of 1,588 ft, and is passing through bird's-eye porphyry, carrying stringers of quartz.

EUREKA DISTRICT.

EUREKA TUNNEL.—*Sentinel*, Aug. 1: The tunnel is now in close on to 750 ft, the last 50 ft improving in ore indications with each blast.

SILVER CONNOR.—This mine is taking out nothing but ore, and it improves in richness as greater depth is attained. We have been shown some beautiful specimens from the lower workings of this mine—genuine nuggets. Sacks full of very rich ore are now stacked by the mouth of the shaft.

ORANGE.—The shaft from the end of the 500 tunnel is now down about 90 ft. Two shifts, three men each, are employed, and they raise only such ore as is met with in sinking.

PHŒNIX.—The Phœnix is in running order, and some ore is being shipped to the Richmond company's furnaces. Several large bins are now well filled with good ore from this mine.

REBEL CREEK DISTRICT.

OHIO LEDGE.—*Silver State*, Aug. 2: This ledge situated near Stump's station, on the Idaho road, was discovered last spring. It has been developed to some extent by a shaft, and is said to be large, rich and well defined. Samples of the ore have assayed from $300 to $2,000 in silver per ton; but it is scarcely possible that all the ore is as rich as these samples.

WILLOW CREEK DISTRICT.

ITEM.—Paradise *Reporter*, Aug. 2: George White, who has been prospecting in Willow Creek district, returned last Thursday with several samples of ore from a ledge he located there. The samples were left with Judge Harlan for assay, and after the test showed an average value of $301.78 in silver per ton.

ARIZONA.

ITEMS.—*Arizonian*, July 30: We have the best of news from the Tiger mill and mine, in Bradshaw mountain, about 40 miles south of Prescott. A private letter recently received states that $40,000 in silver bullion, ranging from $30 to 935 fine, had been shipped. The working shaft is now down about 300 ft. People say the mill is the most perfect ever set up in Arizona. The placer mines of Clifton, Apache county (or more properly the newly-discovered gold region in the southern part of the county), are proving to be immensely rich. Miners are flocking to the new placers, and 23 claims were recorded in one day. Two men have a claim from which it is estimated that they are taking out, at the least calculation, $1,000 per week. In Pinal county the Santa Catalena district improves. Several assays have been running as high as $2,800 in gold from rock taken out of the Highland Mary lode, which is in the Santa Catalena mountains, about 65 miles southeast of Florence. Plenty of wood and water all over the district. In Big Bug district, quartz and placer miners are hard at work. The Tiger mill, on Turkey creek, is running on good ore. The Southern Belle lode is realizing ore at $60 per ton, worked by the arastra.

COLORADO.

SUMMIT COUNTY.—*Miner*, July 26: Carbonates have been discovered on Gibson hill, which is between French Gulch and Gold Run. Six or seven shafts have been sunk, and one tunnel is being run. The Superintendent reports that they are taking from the tunnel daily not less than 30 tons of ore. Good mines have been struck between Breckenridge and the range. Sam Conger has sent down 112 sacks of silver ore to Denver, 120 pounds bringing him at Argo $32.50. This ore was from a point three miles from Breckenridge southwest from the road. F. J. Ebert has struck good ore opposite Conger, between Indiana and Illinois gulches. Wannemacher has got good ore between Conger and Pennsylvania gulch.

PERU DISTRICT.—Cyphers & Mendenhall have struck a lode from which they are taking ore that assays from 1,700 to 1,900 ounces. They have stripped it over 100 ft in length and exposed from 8 to 18 inches of mineral. Other strikes are being made on Cooper and Ruby mountains. Old prospect holes are being sunk down and are showing good ore. The old black quartz in these lodes is running from 75 and 80 to 100 ounces. The new town will probably be near Commodore Decatur's old cabin. The lodes are large fissure veins, low grade on the surface, which improve rapidly as depth is gained. As it is only 14 miles from Georgetown it is easily accessible.

TEN MILE.—On the Sheep mountain, in the Kearsarge, 7 ft of mineral have been exposed on the face, and at depth of 5 ft there are no indications of bottom.

GUNNISON & SAN JUAN.—A gold lode was discov

[CONTINUED ON PAGE 92.]

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending July 17.		Week Ending July 24.		Week Ending July 31.		Week Ending Aug. 7.	
Alpha	26¾	25½	25½	21	25¾	19	25½	20
Alta	11	8¾	8½	6¼	7⅞	6¼	7⅞	6½
Andes	1.20	1	1.05	80c	1	80c	1.30	90c
Alps	....	....	....	....	....	....	....	....
Argenta	1.05	90c	1.65	1.30	1¼	1	1¼	1.05
Atlantic	35c	....	....	....	....	....	....	....
Aurora Tunnel	50c	20c	50c	40c	50c	....	25c	....
Baltimore Con	....	....	....	....	....	....	....	....
Belcher	5¾	4.90	5	3.80	4.30	3.95	4.90	4.10
Belmont	50c	40c	40c	....	40c	30c	70c	40c
Best & Belcher	18	16¾	17¾	15¼	17¾	16	19	16½
Bullion	6⅞	6⅜	6¼	4.80	5⅜	3.95	6¾	5¼
Bechtel	1.95	1.60	1.80	1¼	1.60	1¼	1.40	1¼
Belle Isle	2.90	2¼	4.80	3¼	4.40	3¾	4¼	3½
Bodie	20½	18½	17¾	11¾	14	11	13½	11¾
Benton	7½	6½	5¼	4	4½	3¾	4.70	3.80
Bulwer	8½	8	9	6¾	9	8¼	9½	8¾
Boyle	....	....	....	....	....	....	....	....
Black Hawk	1.70	1	1½	1	95c	75c	1.55	1.35
Belvidere	2¼	1.10	1.10	90c	1	95c	1	85c
Booker	1½	85c	1.10	95c	90c	50c	1½	1.05
Caledonia	2.40	2.05	2.35	2.05	2.20	2	2½	2.05
California	4.90	4¾	4.95	4.60	4.95	4½	5¼	4.80
Challenge	2.60	2	2.40	2.10	2½	2.15	2¾	2¼
Chollar	7½	6	7	6	6⅞	5⅞	7½	6
Confidence	11½	10¼	11	10¼	11	10	12¾	10¾
Con Imperial	1½	1¼	1.65	1¼	1.40	1.15	1.60	1½
Con Virginia	4.85	4.65	4.80	4.60	4.70	4.60	5¾	4.60
Crown Point	5¼	4.90	5	4	4.40	4	5¼	4.40
Con Washoe	....	....	....	....	....	....	....	....
Champion	80c	55c	90c	50c	70c	50c	55c	50c
Concordia	....	....	15c	....	....	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	20c	15c	20c	15c	15c	....	....	....
Daney	....	....	....	....	....	....	2½	....
Day	30c	20c	20c	....	20c	15c	15c	....
Eureka Con	16½	15½	16	15	15	14⅜	15	14½
Exchequer	7	6¼	6	5	5⅜	5	6½	5½
Endowment	45c	35c	45c	40c	....	....	40c	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	4	3½	3.90	3⅜	3⅜	3.60	3⅜	3.55
Gila	1.10	1	1¼	1.05	1⅜	1⅛	1.40	1.20
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	13¾	....	13¾	....	14	13	13	12½
Goodshaw	50c	40c	50c	40c	40c	25c	40c	30c
Gould & Curry	10¾	10¼	10	8	9¼	8¼	11¼	8⅞
Hale & Norcross	15½	12¼	14¾	11¾	13	10¾	15¼	11⅝
Hillside	1½	1½	1¼	....	....	....	1½	....
Highbridge	25c	20c	20c	....	20c	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	25c	15c	20c	15c	15c	....	20c	15c
Independence	2.55	2.30	2.45	1.80	2.15	1.10	3	2.30
Julia	3¾	3½	3.60	3.05	2.95	2.55	3.10	2⅞
Justice	5½	4½	5¼	4.15	4.20	3.60	4.10	3.60
Jackson	4¼	4	4	....	3¾	....	4	3½
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	4.60	4.10	4.30	4	4½	3.90	5¼	4
Kossuth	....	....	15c	....	20c	10c	25c	20c
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	1.20	90c	1	75c	1.30	95c	1.15	1
Lady Wash	2	1¾	1.70	1¼	1.40	1.15	1½	1⅛
Leopard	1.60	1	1.60	1.20	1.40	1	1.15	1
Leviathan	65c	55c	55c	40c	40c	30c	40c	30c
Leeds	80c	70c	75c	....	75c	....	75c	70c
Lee	....	....	....	....	....	....	....	....
May Belle	40c	30c	40c	....	30c	....	....	....
Modoc	....	....	1	....	1	....	1	90c
Manhattan	3.10	2¾	2¾	2½	2¼	2	2¼	2
Martin White	6	5⅜	6	5¼	6	5¼	4	3½
McClinton	1½	1¼	1.30	1	1⅛	1	1.10	1
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	26¾	23	25¾	21	24¾	20¼	33¾	21¼
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	....	....
North Con Virginia	9¼	9	9¼	9	9¼	9	9⅛	9
New York	75c	60c	60c	40c	50c	40c	40c	35c
Northern Belle	5	4	4.95	4¾	4.40	4.15	4.40	4
New Coso	....	....	....	....	....	....	....	....
Navajo	45c	40c	50c	40c	40c	35c	30c	....
Occidental	1	85c	1	90c	90c	80c	1.05	90c
Ophir	37	31	36½	30¼	32½	29½	36¼	30¾
Oriental	25c	20c	15c	10c	45c	10c	50c	25c
Overman	10¼	9	9¼	8¼	9¾	8	10¾	8¼
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	....	....	2¾	....
Phil Sheridan	....	....	....	....	45c	....	80c	35c
Potosi	5	4¾	4.95	4.15	4¾	4.05	5⅜	4.05
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	4.10	3.90	4	3	4	3.90	3¾	2½
Richer	90c	60c	75c	50c	55c	50c	45c	25c
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	14¾	12½	14	11½	12	10¼	13¾	10¾
Seg Belcher	....	....	....	....	....	....	....	....
Sierra Nevada	42¼	38½	42	31¼	40¼	31¼	51½	37
Silver Hill	1.70	1½	1.60	1¼	1¼	1¼	1.40	1¼
Silver King	7½	7	7¼	6¾	6¾	6½	6⅛	6
Silver Prize	15o	....	25c	20c	20c	....	20c	....
Succor	15c	10c	15c	10c	15c	....	....	....
Summit	2½	2.10	2.35	1.40	2.05	1¾	1.90	1¾
Scorpion	2.10	1.70	1.80	1½	1.90	1½	3	1.95
Solid Silver	35c	20c	30c	20c	25c	....	....	....
South Bodie	40c	30c	30c	15c	25c	15c	20c	15c
South Standard	25c	20c	20c	15c	20o	15c	20c	....
Star	75c	50c	60o	45c	....	....	55c	50c
St. Louis	....	....	....	....	....	....	....	....
Syndicate	8	7½	7	5	6	5½	6¾	6
Tioga Con	5⅞	4.60	4½	3½	4	3.10	4½	3.10
Tiptop	80c	75c	90c	75c	1	75c	1.10	95c
Trojan	....	....	10c	5c	10c	5c	25c	5c
Union Con	38	36½	37	29	35	26½	57	27½
Utah	18¼	17¾	17½	13½	16¾	14	20	14¾
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.40	1¼	1.40	1⅛	1.40	1.05	2	1
Wells-Fargo	....	....	....	....	....	....	20c	15c
Woodville	50c	40c	50c	40c	50c	35c	50c	45c
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	15½	14¾	15	12½	16½	14¼	19¾	15¾

Sales at S. F. Stock Exchange.

Friday A. M., Aug. 1.

360 Alta...6¾@6⅝
60 Alpha...20
450 Andes...90c@1
100 Belcher...4.10@4.20
390 Best & Belcher...16¾@16½
160 Bullion...5¼
145 Benton...3.90@3.85
195 California...4.80
75 Con Virginia...4.60@4¾
480 Con Imperial...1.30@1¼
20 Chollar...6¾@6½
690 Crown Point...4.40@4¼
250 C Dorado...1.85
60 Challenge...2¼@2.35
80 Caledonia...2.10
200 Exchequer...5¼@5⅜
200 Flowery...50c
30 Gould & Curry...8¾
425 Hale & Nor...12@11¾
270 Justice...3¾@3.95
205 Julia...2.60@2¾
210 Kentuck...4
100 Kossuth...20c
500 Lady Bryan...1@1.05
120 Lady Wash...1½
20 Leviathan...30c
300 Mexican...21½
150 Mackey...1.15
45 North Con Vir...9
325 New York...40@35c
375 N Bonanza...1.40@1½
215 Ophir...30¾@30½
20 Overman...8@8¼
150 Occidental...90c
130 Potosi...4.20
730 Sierra Nevada...37
275 Savage...10¾@10¾
100 Silver Hill...1¼
250 Scorpion...1.95@2
460 Trojan...5c
185 Utah...14¾@15
735 Union Con...29@27¼
450 Woodville...50@45c
925 Ward...1@1.05
315 Yellow Jacket...15¾

AFTERNOON SESSION.

975 Argenta...1.10@1.05
100 Albion...20c
550 Adenda...30@25c
1395 Belle Isle...3.60@3¾
300 Belmont...40c
120 Bodie...11⅝
960 Booker...1.20@1.05
110 Black Hawk...1.45
540 Bechtel...1¼
100 Belvidere...90c
60 Bulwer...8¾@9
915 Champion...50c
950 Crœsus...20c
145 C Pacific...6@6½
50 D Standard...90c
565 Defiance...95c
665 Dudley...1¼
105 Eureka Con...14¾@15
200 Fourth July...60c
115 Grand Prize...3.65
80 Goodshaw...40c
40 Glory...1.15
100 Golden Terra...13
210 Gila...1.30@1.40
1205 Independence...2.40@2.30
10 Jackson...3¾
170 Jupiter...2
300 Leopard...1
80 Manhattan...2.10
120 Mono...7¾
520 Martin White...4
10 McClinton...1.05
15 Mammoth...11½
750 N Belle Is...35c
150 Noonday...3½
370 N Noonday...2¾
425 Orient...40@50c
280 Queen Bee...65c
150 Richer...45c
360 S Standard...20c
145 Syndicate...6
25 Standard...30
300 Silver Prize...20c
350 S Bodie...20@15c
110 Silver King...6½@6
215 Summit...1.80@1¾
100 S Bulwer...65c
650 Tioga Con...3.10@3.20
150 Vortex...70c
80 Wales...4½

Saturday A. M., Aug. 2.

30 Alpha...20@20½
450 Andes...90c@1
105 Alta...6¾@6¾
900 Argenta...1.15@1.10
400 Adenda...50c
150 Belcher...4½
170 Bullion...5¼
280 Benton...3.85@3.80
35 Best & Belcher...16½@17
290 Belmont...65@55c
990 Belle Isle...4@3.95
900 Bodie...12@11¾
5 Belvidere...1
250 Bulwer...9
320 Black Hawk...1.35@1.40
1175 Booker...1.40@1½
390 Champion...50c
350 California...4.90@4.95
850 Con Virginia...4.85@4.80
50 Chollar...6½@6
200 Caledonia (BH)...2½
180 Crown Point...4.40
1600 Con Imperial...1¼
130 Confidence...10¾
50 Challenge...2.40
75 Caledonia...2.05
350 C Dorado...1.90
175 C Pacific...6½
70 Dudley...1¼
200 Exchequer...5¼
30 Eureka Con...15
50 Endowment...40c
350 Flowery...45@50c
280 Gould & Curry...9@8⅞
20 Grand Prize...3¾
305 Goodshaw...30@40c
30 Glory...1.20
100 Golden Terra...12½
75 H & Norcross...12
320 Independence...2.40@2.45
205 Justice...3.90@3.80
250 Julia...2.55@2½
20 Jackson...3½
100 Kentuck...4
200 Kossuth...25c
120 L Wash...1¼@1.20
300 L Bryan...1.05@1
100 Leviathan...35c
1200 Leopard...1.05@1
35 Leeds...70c
50 M White...4
100 Mammoth...11½@11¼
395 Mexican...22¾@23
220 Mackey...1.20@1¼
110 Manhattan...2¼@2.10
60 Mono...7¾
100 New York...35c
125 North Con Vir...9
160 N Bonanza...1½
20 Northern Belle...4.30
250 Navajo...30c
50 Noonday...3½
700 N Noonday...2¾@2½
65 Overman...8¼@8¼
350 Occidental...1
135 Ophir...31½@32
230 Potosi...4.05@4.15
100 Paradise...1.65
200 Red Cloud...35@40c
100 Rustler...70c
150 Summit...1.60@1.85
90 Syndicate...6¼
80 Savage...11
825 Sierra Nevada...38½@39½
150 Silver Hill...1.30@1¼
320 Scorpion...2.65@2.90
1400 S Utah...5c
20 S Potosi...85c
950 Tioga Con...3.40@3¾
50 Utah...15¾@15⅝
540 Union Con...31½@32
550 University...40c
100 Vortex...70c
550 Woodville...50c
320 Ward...1½
740 Yellow Jacket...16¾@16

Monday A. M., Aug. 4.

20 Alpha...21½
1075 Andes...1
485 Alta...7
440 Bullion...5¾@5½
470 Belcher...4½@4.60
345 Best & Belcher...18
345 Benton...4.10@4
240 California...4.95@5
4175 Con Imperial...1.40@1.35
760 Crown Point...4½@4¾
530 Confidence...11½@11¼
300 C Dorado...1.90
100 Challenge...2¾
230 Caledonia...2.20@2.45
290 Con Virginia...4.90@4.65
185 Chollar...6¾@6¾
490 Exchequer...5¼@5¼
600 Flowery...70@75c
855 Gould & Curry...9¼@9⅞
455 Hale & Nor...13¼
245 Justice...3.70
415 Julia...2¾@2.70
85 Kentuck...4.15
400 Kossuth...25c
600 Lady Bryan...1.15
670 Lady Wash...1¼@1.20
1430 Mexican...27@26½
100 Mount View...2.60@2½
250 Mackey...1¼
640 N Bonanza...1.65@1.85
100 New York...35c
25 N Con Virginia...9
165 Overman...9
575 Ophir...35@35¾
280 Occidental...1
300 Phil Sheridan...35c
50 Potosi...4.30
430 Savage...12⅞@12
1095 Sierra Nevada...48½@47
635 Scorpion...2.90@3
265 Silver Hill...1¼@1.30
2000 S Utah...5c
250 Utah...17@16¾
1420 Union Con...38@39¾
170 Ward...1½
705 Yellow Jacket...16¾@17

AFTERNOON SESSION.

590 Argenta...1.15
100 Adenda...55@60c
505 Albion...20@30c
800 Belmont...70c
760 Booker...1.45@1½
365 Black Hawk...1.35@1.40
50 Belvidere...95c
120 Bulwer...9@9¼
235 Bodie...13¼
350 Bechtel...1¼
595 Belle Isle...4¼@4.10
300 Champion...55c
100 Caledonia (B H)...2½
100 Crœsus...20c
500 C Pacific...7@6¾
300 Day...15c
230 Dudley...1.55@1½
50 Defiance...90c
65 Eureka Con...14¾@15
30 Glory...1.20
220 Grand Prize...3.60@3.55
325 Gila...1.30@1.40
200 Goodshaw...35c
250 Hamburg...40c
100 Hillside...1½
1560 Independence...2½@2.60
30 Jackson...3¾
350 Jupiter...2
85 Leeds...75c
1430 Leopard...1.05@1½
495 M White...3¾
210 Mono...7⅞@7¾
490 Mammoth...11½@11¾
100 Modoc...1
775 N Belle Is...45@40c
90 Northern Belle...4¼@4
60 Noonday...3.60@3¾
175 N Noonday...2.85@3
1450 Orient...25@20c
300 Oriental...40c
100 Paradise...1¾
250 Phenix...2½
300 Queen Bee...60@65c
700 Richer...25@30c
90 Raymond & Ely...2½@2¼
100 Rustler...60c
250 Red Cloud...40c
40 Summit...1.90@1⅞
80 Syndicate...6½@6⅝
500 S Bodie...20c
1000 S Bulwer...60@70c
680 Tioga Con...3.80@3.90
180 University...40c
100 Vortex...70c

Tuesday A. M., Aug. 5.

75 Alpha...22
120 Alta...7½@7⅞
335 Andes...1@1.10
450 Bullion...5⅜@5½
670 Belcher...4¾@4.80
370 Best & Belcher...18@17¾
310 Benton...4¼@4½
300 Con Dorado...1.90
835 California...4.95@5
180 Con Virginia...4.95@5
735 Crown Point...4¾@5
1050 Con Imperial...1.40
105 Confidence...12
245 Chollar...6⅞@6¾
100 Challenge...2.60@2½
190 Caledonia...2.40
470 Exchequer...5⅜@5½
1460 Flowery...70@80c
275 Gould & Curry...9½@9⅝
550 H & Norcross...13¾@13½
330 Justice...3.95@4
225 Julia...2.80@2.90
180 Kentuck...4.40@5
175 Kossuth...15c
840 Lady Wash...1.45@1.30
520 L Bryan...1.15
505 Mexican...26¾@27
680 Mackey...1.30@1.40
885 N Bonanza...1.80@1.95
80 North Con Vir...9
900 New York...35c
55 Overman...9½@9¼
630 Ophir...34½@33¾
195 Occidental...1
350 Phil Sheridan...65@50c
140 Potosi...4½@4.40
200 Silver Hill...1¾@1.30
395 Savage...12¼@12
460 Scorpion...2.80@2.90
650 S Utah...5c
685 Sierra Nevada...46@47
80 Utah...17¼
815 Union Con...45@45¼
1200 Ward...1.60@2
100 Wells-Fargo...20c
150 Woodville...50c
1265 Yellow Jacket...18@18¾

AFTERNOON SESSION.

500 Addenda...50@55c
400 Albion...15c
690 Argenta...1.15@1¼
1205 B Chief...50c
1580 Booker...1.35@1¼
1300 Black Hawk...1½@1.45
1690 Belle Isle...3½@3.80
195 Belvidere...90@85c
100 Belmont...65c
330 Bulwer...9¼@9¾
220 Bodie...13@12¾
430 Bechtel...1.30@1.40
350 Champion...50@55c
30 Caledonia (B H)...2½
95 C Pacific...7@6¾
125 Dudley...1½@1.40
30 Defiance...80c
120 Eureka Con...14¾
30 Glory...1.20
110 Grand Prize...3.60
300 Goodshaw...30c
1005 Gila...1.30
175 Hussey...20c
175 Hillside...1½
100 Hamburg...40c
600 Independence...2¾@3
70 Jackson...3.90@4
250 Jupiter...2.20@2¼
1570 Leopard...1.10@1
50 Leeds...70c
200 Manhattan...2.10
400 Martin White...3½
130 Mammoth...11¾
360 Mono...8
370 McClinton...1.10@1
50 Mt Diablo...4½
2420 N Belle Is...50c
230 Noonday...3¾
1100 N Noonday...3.10@3
200 Northern Belle...4¼@4.40
500 Oriental...45@50c
3550 Orient...20@25c
600 Paradise...1.85@1.80
200 Queen Bee...55c
50 Raymond & Ely...3½
100 Richer...45c
500 Red Cloud...50c
125 Summit...1.85
700 Silver Prize...20c
210 Star...55c
1525 S Bulwer...70@65c
1200 S Bodie...20@15c
230 Syndicate...6¾
170 Tiptop...95c@1
375 Tioga...4.20@4.10
100 University...45c

Wed'sday A. M., Aug. 6.

320 Alpha...25@25½
480 Alta...7¼@7
950 Andes...1.15@1¼
1305 Bullion...6¾@6¼
520 Belcher...4.90@4.70
720 Best & Belcher...19@16½
895 Benton...4.70@4½
550 Con Dorado...1.85
24 0 Con Imperial...1.60@1.55
465 Crown Point...5@5¼
50 Confidence...12¾
1910 Con Virginia...4.95@5
820 Chollar...7½
430 California...4.95@5
230 Challenge...2.70@2¾
340 Caledonia...2.40@2½
520 Exchequer...6½
2750 Flowery...1@1.10
705 Gould & Curry...11@11¼
585 Hale & Nor...15¼@14½
520 Julia...3.10
470 Justice...4.05@4.10
270 Kentuck...5¼@5¼
370 Leviathan...30@40c
1195 Lady Wash...1.45@1½
650 Lady Bryan...1.15
1525 Mexican...32¾@33¾
570 Mackey...1.35
100 Mountain View...2.60
100 North Con Vir...9
2200 N Bonanza...2.10@1.90
880 New York...40c
265 Overman...10½@10¾
700 Ophir...35½@36¼
140 Occidental...1
2250 Phil Sheridan...75@80c
380 Potosi...5@5⅜
400 Peytona...1
150 Silver Hill...1¾@1.40
830 Sierra Nevada...51@51½
1170 Scorpion...3@2.90
790 Savage...13¼@13¾
100 Senator...25c
1000 S Utah...5@10c
100 Trojan...25c
1190 Union Con...54@57
460 Utah...19¾@20
400 Wells Fargo...15c
450 Ward...1.85@1.80
200 Woodville...50c
925 Yellow Jacket...19¾@18¾

AFTERNOON SESSION.

675 Albion...15c
190 Aurora T...25c
1090 Addenda...50c
1045 Argenta...1.15@1¼
855 Belmont...70c
220 Black Hawk...1¼@1.55
470 Booker...1.35@1.30
995 Bodie...11
1170 Belle Isle...3¾@3.70
60 Bechtel...1.35@1.40
275 Bulwer...9¼@9¼
1800 B Chief...50c
1250 Champion...50c

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Amazon Con M Co	Nevada	6	10	Mar 24	June 11	Aug 29	Jno Crockett	12 Cosmopolitan Hotel
Belcher S M Co	Nevada	19	1 00	July 21	Aug 26	Sept 16	Jno Crockett	203 Bush st
Belmont M Co	Nevada	21	30	July 1	Aug 7	Sept 2	J W Pew	310 Pine st
Belvidere M Co	California	4	25	July 9	Aug 11	Sept 6	C V Hubbard	203 Bush st.
Booker Con G M Co	California	3	50	June 30	Aug 4	Aug 25	W H Lent	309 Montgomery st
Brilliant M Co	Nevada	4	10	July 18	Aug 18	Sept 3	H S Stone	419 California st
Bullion M Co	Nevada	10	1 50	July 9	Aug 13	Sept 3	J Gruss	418 California st
Champion M Co	Nevada		25	July 26	Aug 31	Sep 30	G C Hurlbut	525 Commercial st
Commonwealth Con M Co	Nevada	1	25	June 27	July 11	Aug 30	C A Morse	217 Sansome st
Eagle S M Co	Nevada	14	10	Aug 4	Sept 10	Sept 30	J E Byrne	533 Kearney st
Exchequer M Co	Nevada	14	1 50	July 9	Aug 15	Sept 5	J Gruss	418 California st
Gold Deposit G & S M Co	California	1	25	July 25	Aug 28	Sept 16	J M Buffington	209 California st
Goodshaw M Co	California	4	25	July 9	Aug 23	Sept 30	V Feinbach	327 Pine st
Gould & Curry S M Co	Nevada	36	1 00	July 10	Aug 14	Sept 3	Alfred K Durbrow	309 Montg'y st
Julia Con M Co	Nevada	9	1 25	July 8	Aug 13	Sept 4	H A Charles	419 California st
Jupiter M Co	California	4	25	July 5	Aug 11	Sept 4	E C Masten	22 Nevada Block
K K Con M Co	Nevada	—	1 00	Aug 1	Sept 3	Oct 1	B B Minor	309 Montgomery st
Manhattan S M Co	Nevada	13	1 00	July 16	Aug 21	Sept 12	Jno Crockett	203 Bush st
McCrackin Con M Co	Arizona	3	25	July 29	Aug 29	Sept 17	H Aug Whiting	211 Sansome st
Mexican G & S M Co	Nevada	7	2 00	July 11	Aug 14	Sept 4	C L McCoy	203 Bush st
N Noonday M Co	California	2	25	June 5	July 14	Aug 18	G A Holden	310 Pine st
New York M Co	Nevada	19	40	July 8	Aug 9	Aug 29	D L Thomas	203 Bush st
Original Keystone S M Co	Nevada	2	25	July 28	Sept 1	Sept 26	F E Luty	330 Pine st
Real Del Monte M Co	Nevada	7	1 00	June 10	July 19	Aug 11	C V D Hubbard	203 Bush st
Savage M Co	Nevada	38	1 00	July 8	Aug 11	Aug 30	E B Holmes	309 Montgomery st
Silver Hill M Co	Nevada	7	60	July 10	Aug 14	Sept 4	W E Dean	203 Bush st
South Bodie G M Co	California	1	25	July 18	Aug 25	Sept 17	H Deas	309 Montgomery st
South Bulwer	California	4	15	July 16	Aug 20	Sept 12	Wm Stuart	320 Sansome st
Star M Co	Nevada	2	20	June 3	July 15	Aug 11	———	320 Sansome st
Tellurian G & S M Co	California	19	10	Aug 1	Sept 1	Sept 24	J M Litchfield	415 Montgomery st
Trojan M Co	Nevada	11	25	July 14	Aug 18	Sept 8	David Wilder	328 Montgomery st
Tuscarora M & M Co	Nevada	4	10	Aug 2	Sept 6	Sept 30	M E Sperling	309 California st
Union Con S M Co	Nevada	14	2 00	July 31	Sept 4	Sept 23	J M Buffington	309 California st
Ward G & S M Co	Nevada	4	50	July 2	Aug 7	Aug 27	J Stadtfeldt, Jr	26 Haywards Build
William Penn	Nevada	5	05	July 12	Aug 13	Aug 30	O J Humphrey	328 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Addeuda G & S M Co	California	1	20	July 2	Aug 7	Aug 28	T H Dixon	238 Montgomery st
Armand G & S M Co	California	1	10	June 9	July 28	Aug 25	J L Fields	240 Montgomery st
Black Hawk G M Co	California	6	50	July 1	Aug 4	Aug 25	H A Charles	21 Haywards Build
Crœsus G & S M Co	California	1	05	June 16	July 21	Aug 14	E Hestres	328 Montgomery st
Curtis Con M Co	Nevada	1	10	July 11	Aug 11	Aug 30	H S Stone	419 California st
Dudley M Co	California	4	25	June 12	July 16	Aug 11	E C Masten	22 Nevada Block
Fall Creek M Co	California	3	40	June 11	July 22	Aug 14	C Robinson	310 Pine st
Giant and Old Abe M Co	California	1	50	June 4	July 15	Aug 14	———	49 Nevada Block
Gover M & M Co	California	38	50	May 21	July 1	Aug 11	W O Wilson	402 Front st
Hartford S M Co	California	1	50	June 16	July 21	Aug 13	S Heringhi	422 Montgomery st
Leo M Co	Nevada	5	50	June 14	July 18	Aug 8	J J Scoville	59 Nevada Block
Mayflower Grav M Co	California	5	10	June 17	July 22	Aug 23	J Morizio	328 Montgomery st
Mono G M Co	California	4	50	June 21	July 28	Aug 18	W H Lent	309 Montgomery st
Numa M Co	Nevada	1	03	June 13	July 24	Aug 11	D Wilder	328 Montgomery st
Oriental Con G & S M Co	California	3	25	June 25	July 25	Aug 11	H C Hinman	411 California st
Oro M Co	California	2	05	———	Aug 4	Aug 23	Wm Stuart	320 Sansome st
Queen Bee M Co	California	4	10	July 10	Aug 30	Sept 2	T A White	113 Leidesdorff st
Rustler G M Co	California	1	10	June 30	Aug 4	Aug 18	A F Main	309 California st
San Pedro G & S M Co	California	2	05	July 29	Aug 29	Sept 15	T A White	113 Leidesdorff st
Seg Europa M Co	Nevada	1	25	Apr 4	July 31	Aug 18	R B Noyes	240 Montgomery st
Sherwood Con M Co	Nevada	1	25	July 12	Aug 12	Aug 30	H S Stone	419 California st
Swansea M Co	California	1	10	June 14	Aug 4	Aug 25	F N Delaney	315 California st
Richer M Co	California	3	25	July 30	Sept 3	Sept 28	W H Lent	309 Montgomery st
Wide Awake M & P Co	Arizona	7	02	June 23	Aug 1	Sept 1	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Alta S M Co	Nevada	Wm H Watson	302 Montgomery st	Annual	Aug 21
Calabasas L & M Co	Arizona	F A McGee	Merchants' Exchange	Annual	Aug 12
Comstock G & S M Co	Nevada	J M Buffington	309 California st	Annual	Aug 18
Crœsus G & S M Co		E Hestris	328 Montgomery st	Annual	Aug 18
DeHaro M Co	——	W W Bausman	409 California st	Annual	Aug 13
Europa M Co	Nevada	J L Fields	240 Montgomery st	Annual	Aug 14
George Douglass M Co		W W Bausman	409 California st	Annual	Aug 14
Independence M Co	Nevada	Jno E Dixon	327 Pine st	Annual	Aug 18
Julia Con M Co	Nevada	H A Charles	419 California st	Annual	Aug 13
Lucky Rocky G M Co	——	Chas Healy	Merchants Exchange	Annual	Aug 16
Mount Hood M Co	——	W W Brausman	409 California st	Annual	Aug 21
Navajo M Co	Nevada	J E Dixon	Stock Exchange	Annual	Aug 12
Rocky Point M Co	California	T L Bibbins	314 Bush st	Annual	Aug 18
S Comstock Con S M Co	Nevada	J M Buffington	309 California st	Annual	Aug 18
Sabine M Co	——	W W Bransman	409 California st	Annual	Aug 21
Swiss M Co	——	A Sarboro	521 Washington st	Annual	Aug 22
Seg Europa M Co	Nevada	J L Fields	240 Montgomery st	Annual	Aug 15
South Comstock G & S M Co	Nevada	J M Buffington	309 California st	Annual	Aug 18
Star M Co	Nevada	Wm Stuart	302 Sansome st	Annual	Aug 25
Tolo M Co	——	W W Bausman	409 California st	Annual	Aug 14
Vancouver M Co	——	W W Bausman	409 California st	Annual	Aug 13

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Argenta M Co	Nevada	J E Dixon	Stock Exchange	20	July 25
Belle Isle M Co	Nevada	John E Dixon	Stock Exchange	50	Aug 5
Bodie Con M Co	California	W H Lent	Nevada Block	1 00	Aug 1
California M Co	Nevada	C P Gordon	23 Nevada Block	50	June 17
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	50	June 16
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	1 00	July 21
Independence M Co	Nevada	John E Dixon	Stock Exchange	25	July 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	July 26
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	30	July 28

200 Crœsus...20c
130 C Pacific...7@6¾
100 Caledonia (B H)...2½
20 Defiance...80c
350 Day...15c
280 Dudley...1½
160 Eureka Con...14¾@14½
300 Golden Terra...13
700 Goodshaw...30@35c
100 Glory...60c
110 Grand Prize...3¾
250 Gila...1.30@1.20
600 Hussey...15c
20 Hillside...1½
380 Independence...2.90@3
730 Jupiter...2@2.10
350 Jackson...4
315 Leeds...70c
1970 Leopard...1.10@1.15
600 Martin White...3½@4
60 Mono...7
130 McClinton...1
625 Manhattan...2
435 Mammoth...11¾@11½
70 Modoc...90c
50 Mt Diablo...4
2250 N Belle Is...50@55c
200 Northern Belle...4@4.10
1350 Noonday...3¾@3.90
2250 N Noonday...3@3¼
150 Oriental...35@25c
600 Orient...30@25c
50 Phenix...2¾
830 Paradise...1.85@1.90
100 Queen Bee...60@65c
200 Richer...45c
100 Raymond & E...3¾
600 Red Cloud...50c
50 Real del Monte...2½
500 Silver Prize...20c
900 S Bulwer...75@70c
170 Summit...1.90@1.80
500 Star...50@55c
180 Syndicate...6@6½
630 Tioga Con...4½
400 Tiptop...1.10@1
1150 University...45@40c
2300 Vortex...65@55c
170 Wales...4¾

SALES OF LAST WEEK AND THIS COMPARED

Thursd'y A. M., July 31.

130 Alpha...20@25½
395 Alta...6¾@6⅜
850 Andes...90@95c
410 Belcher...3.95@4
475 Benton...4@3.95
340 Bullion...5⅜@5¼
185 B & Belcher...16¾@16½
260 Caledonia...2.05@2.10
90 California...4.80@4¾
10 Con Virginia...4.60
80 Chollar...6¼@6¼
130 Crown Point...4.40
1210 Con Imperial...1¾@1.30
160 Confidence...11@10¾
235 Challenge...2¼@2.40
250 Con Dorado...1.60
450 Exchequer...5¼@5⅜
200 Flowery...50c
30 Gould & Curry...8¾@8⅞
505 Hale & Nor...12@12¼
60 Justice...4
315 Julia...2.65
40 Kentuck...3.90
200 Kossuth...20c
880 Lady Bryan...1.10@1¼
675 Lady Wash...1.20@1¼
400 Leviathan...30c
1005 Mexican...22¾@22
950 Mackey...1.15
210 North Con Vir...9¼@9¼
440 N Bonanza...1.40@1.45
750 Ophir...32@32¼
55 Overman...9@9¼
175 Occidental...90@85c
320 Potosi...4¼@4½
430 Savage...11
835 Sierra Nevada...39@40¼
250 Silver Hill...1.20@1.15
100 S Utah...10c
140 Scorpion...1.90
100 Solid Silver...25c
95 Utah...16½@16¾
1300 Union...35@33¼
640 Woodville...50c
425 Ward...1
515 Yellow Jacket...15½@15¼

AFTERNOON SESSION.

300 Albion...20c
175 Addenda...30@25c
1340 Argenta...1@90c
380 Bulwer...8½@8¾
920 Black Hawk...90@85c
80 Belvidere...1@95c
1435 Belle Isle...3.65@3.60
530 Bodie...12¼@12½
880 Bechtel...1¼@1.30
1715 Booker...1@1.10
200 Crœsus...20c
365 Con Pacific...6¾@6½
1100 Caledonia (B H)...2½@2
675 Champion...50c
430 Dudley...1¼
155 Defiance...1
410 Grand Prize...3¾@3.60
300 Goodshaw...35c
220 Golden Terra...12
1485 Gila...1½@1.30
100 Hillside...1½
615 Independence...2
870 Jupiter...2@1.95
100 Leopard...1
150 Leeds...75@70c
580 M White...5@4¾
190 Mammoth...11½
330 Mono...7¼
150 Mt Diablo...5@4½
100 Modoc...1
660 McClinton...1.10@1
305 Manhattan...2@2¼
145 Northern Belle...4¼
200 Navajo...30c
950 N Belle Is...35c
250 Noonday...3½
400 N Noonday...2¾
800 Orient...35@45c
500 Oriental...35c
390 Paradise...1½@1.60
350 Queen Bee...65c
200 Red Cloud...45c
70 Raymond & E...3.90@3.80
40 Rustler...70c
300 Silver Prize...20c
335 S Bulwer...70c
50 Syndicate...5¾
400 S Bodie...20c

Thursday A. M., Aug. 7.

590 Alta...6¼@6½
40 Alpha...24@24½
900 Andes...1¼@1.30
130 Best & Belcher...18@17½
535 Belcher...4.60@4.55
180 Bullion...6¼@6⅝
180 Benton...4.35@4¼
75 California...5¼@5¼
145 Chollar...7
330 Con Virginia...5¼@5⅜
395 Crown Point...4¾@4.65
625 Con Imperial...1.45@1½
385 Caledonia...2.40
80 Challenge...2½
350 C Dorado...1¾
100 Daney...2½
275 Exchequer...6¼@6½
3200 Flowery...75@50c
670 Gould & Curry...9⅝@9½
340 Hale & Nor...13¼@13¾
970 Justice...3.80@3.60
625 Julia...2.80@2.95
325 Kentuck...5@5¼
260 L Bryan...1@1.05
200 Leviathan...35c
350 Lady Wash...1¼@1.30
1000 Mexican...29½@28¾
1230 Mackey...1.35@1½
1845 New York...35@40c
150 N Con Vir...9½
1410 N Bonanza...1.60@1¾
130 Ophir...33½@33¾
145 Overman...10@9⅞
220 Occidental...1.05
260 Potosi...4¾@4.80
1820 Phil Sheridan...70@50c
660 Savage...12@11¾
1545 Sierra Nevada...44@46½
655 Silver Hill...1¼@1.20
500 Senator...25c
490 Scorpion...2.40@2½
800 S Utah...5c
85 Utah...17¼@18
815 Union Con...51½@53
640 Woodville...50c
2300 Wells-Fargo...50c
110 Ward...1.65@1.70
310 Yellow Jacket...17¼@17½

AFTERNOON SESSION.

1850 Argenta...1¼@1.20
350 Albion...15c
500 Addenda...50c
1000 B Chief...55c
125 Belvidere...90c
230 Booker...1¼@1.40
50 Black Hawk...1.60
550 Belle Isle...3¾@3.70
285 Bodie...11@10¾
30 Bechtel...1¼
200 Belmont...90c@1
340 Champion...50@40c
200 Caledonia (B H)...2½
160 C Pacific...7@6¾
600 Crœsus...25c
600 Day...15@10c
50 Dudley...1½
115 Eureka Con...14⅞
20 Glory...1.10
275 Grand Prize...3.90
520 Gila...1.30@1¼
350 Goodshaw...25c
20 Hillside...1.40
1720 Independence...2.40@2.45
45 Jackson...4¼
550 Leopard...1.05@1
45 Mammoth...11½
415 Mono...7@7¼
270 Martin White...3¾@3.95
300 McClinton...90c
50 Modoc...90c
105 Mt Diablo...4¼@4½
1200 N Belle Is...55@50c
5 N Noonday...3.10
475 Northern Belle...4
900 Orient...30c
1300 Oriental...40@35c
1510 Paradise...2
1400 Queen Bee...60@65c
75 Raymond & Ely...3½
50 Real del Monte...2½
250 Rustler...50c
200 Richer...35c
200 Red Cloud...50c
50 Star...50c
55 Silver King...6¼
545 S Bulwer...75@70c
200 S Standard...10c
150 S Bodie...15c
340 Summit...2
560 Syndicate...6@5¾
590 Tioga Con...4.10@4

90	Silver King	6¾@6	100	Tuscarora	5c
25	Tiptop	65c	190	Tiptop	1
205	Tioga Con	3.10@3.20	450	University	40c
250	Vortex	75@70c	2835	Vortex	55@60c
140	Wales	4¼	155	Wales	4¾

Pacific Board—Latest Sales.

Wed'sday A. M., Aug. 6.			Afternoon Session.		
100	Andes	1.15@1.20	40	Alta	7¾
110	Alta	7¼@7	10	Andes	1¼
20	Bullion	6¾@6½	70	Benton	4½@4¾
30	Best & Belcher	18¾@19¾	100	Bodie	10¾
10	Bodie	11½	80	Belcher	4.95@4.65
910	Belcher	5@4¾	40	Bullion	6.30
370	Benton	4½@4.80	160	Con Virginia	5
30	Chollar	7¼@7½	450	Con Imperial	1.55@1½
450	Con Imperial	1.55@1.60	30	Exchequer	6¾
100	California	4.95	450	Flowery	90c
30	Con Virginia	5¼@5	10	Gould & Curry	10¾
70	Crown Point	5½@5¾	90	Hale & Nor	13¾@13¾
170	Gould & Curry	10¾@11	90	Julia	3¼@3
130	Hale & Nor	15½@14½	60	Justice	3.85@3¾
110	Justice	4½@4	300	Leopard	1.10@1.05
85	Julia	3¾@3.15	200	Manhattan	2@1.95
120	Mexican	32¼@32¼	125	Mexican	33¾@30¾
100	N Bonanza	2	100	M White	3½
50	New York	40c	200	N Standard	2¼
80	Overman	11@10¾	405	Ophir Co	3¾@3½
145	Ophir	36	10	Ophir	34½
130	Potosi	5@5¼	400	S Utah	5c
120	Savage	13½@13	30	Sierra Nevada	49¾@48
60	S Nevada	51½@53	25	Silver Hill	1.30@1¾
50	Silver Hill	1.40	100	Trojan	7c
50	Union	53¾@56	10	Utah	19
10	Utah	20	20	Union Con	54½
50	Ward	1.90	100	Wells-Fargo	20c
145	Yellow Jacket	19¾@19	5	Yellow Jacket	18

California Board—Latest Sales.

Wed'sday A. M., Aug. 6.			30	Yellow Jacket	19¾
30	Alpha	24½	Afternoon Session.		
40	Alta	7½@7¾	30	Alpha	24½
50	Ætna (N)	8½	30	Alta	7@7½
30	Belcher	5½	30	Argenta	1¼
40	Best & Belcher	19¾	125	Ætna (N)	3½
40	Bullion	6¾@6½	125	Atlanta	1c
40	California	5	75	Ætna (A)	20c
90	Con Virginia	5@5¼	325	Atlas	15c
200	Con Imperial	1½	200	Almaden Q	2½
30	Crown Point	5¼	40	Best & Belcher	17½@17¾
50	Chollar	7¾	40	Bullion	6½@6¾
130	Challenge	2¾	45	California	5
290	Caledonia	2½	200	Con Imperial	1½
40	Exchequer	6¾@6¼	40	Crown Point	5.10
30	Gould & Curry	10¼	35	Challenge	2.70
40	Hale & Nor	15	150	Caledonia	2 40
30	Julia	3¼	300	Con Washoe	35c
40	Justice	4.10	500	Coso Con	6c
1200	Leo	65@55c	45	Exchequer	6½
30	Mexican	32½	500	Enterprise	1¼
100	Mint	7c	40	Gould & Curry	10¾@10¾
200	Monumental	3c	100	Gila	1¼
300	N Sierra Nevada	9c	30	Hale & Nor	14
100	N Union	45c	100	Hussey	16c
140	New York	40c	80	Julia	3.10@3
250	North Carson	1c	90	Justice	4@4.05
20	Ophir	36¾	300	Leo	55c
2806	Orient	21c	30	Mexican	32
20	Potosi	4.80	300	Mint	7@8c
30	Savage	13¼	100	N Sierra Nevada	6c
30	Sierra Nevada	51	300	North Carson	1c
20	Silver Hill	1.40	40	Ophir	34¾
200	S Utah	10c	30	Sierra Nevada	49½@49¾
200	Silver Prize	20c	100	Succor	13c
200	Trojan	7c	130	S Utah	5c
20	Union Con	54½@54	40	Union Con	33@53½
100	Wm Penn	10c	40	Yellow Jacket	18½@18

The Mining Share Market.

Without what may be termed a "booming" market, the past has been a satisfactory week to dealers in mining shares. After a season of depression, with sales slow and limited in extent, the market gained animation and strength at the very end of the week. Monday came and with it an incisive, sudden and unexpected upheaval, the north end stocks being especially buoyant. Chippers in hastened to realize, this being the first opportunity that had offered for a long time to make a profit, while short sellers, alarmed at the prospect, lost no time in filling outstanding obligations, a combination of movements that served to keep life in the market for several days after. Indeed the week closes with great activity and a cheery outlook. On Wednesday there was a lively call at advanced figures for Comstock shares, the demand reaching to nearly every standard stock from Utah to Silver Hill. As there have been but few Eastern orders since the June collapse, these purchases must have been mostly on home account, disclosing a growing confidence among local operators in this class of securities. But how to interpret these movements it would be difficult to say. The stock manipulator, like the oarsman, looks one way when he pulls the other. Stocks may be put up on their merits, through improvements occurring in mines or through the efforts of insiders who, having discovered the worthlessness of the mines, may be desirous of getting out. The Comstock sphynx sits in the Washoe deserts, mysterious and dumb, a puzzle to all save the keepers of the oracles themselves. Outside worshipers are at a loss to know whether it is coming or vanishing—a stern reality or only a myth. There is evidently a growing belief that important developments are about to transpire at more than one point along the great ore channel. What serves to strengthen this impression is the close personal attention that Mackay and Fair are just now giving to operations there. These men are not apt to devote themselves individually to this sort of work, unless some important ore revealments are expected and even imminent. At any rate, this is the construction put upon their constant presence in the lower levels of certain mines of late. Then, too, the knowing ones are generally beginning to stand in to the support of the old favorites, which also seems significant of the early approach of the good time coming. We trust it will not this time prove a failure, nor be much longer delayed. At the very end of the week the Comstocks, with one or two exceptions, closed stiff, while Bodie and other outside stocks were a little off. This class of mines are, however, generally looking well, and with the opening of new ore bodies, their shares would quickly respond in higher prices.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

Items.—*Dispatch*, Aug. 2: The Gray Eagle mine is being thoroughly prospected. Five stamps of the Empire mill are being run on rock taken from the mine as a test. The Victoria mine, south of the Empire, is also being prospected by San Francisco capitalists.

Downs.—*Ledger*, Aug. 2: The new double-compartment shaft is down 200 ft, and connection made with the old shaft. Ventilation is now good. In the Lincoln, running drifts by contract system is the work in hand. The mill is running. The Potosi, between Amador City and Plymouth, is inactive, with the exception of keeping down the water. The Maryland continues to work a small force of men.

BUTTE.

Banner Mine.—*Mercury*, Aug. 1: C. W. Keeney, Superintendent of the Banner mine, went to San Francisco Wednesday, taking with him 33 pounds of quartz gathered from the old tunnel run by McSmith and Sparks in '59. Old prospectors and miners who saw the rock, estimate its value at $130 a ton on the dump.

CALAVERAS.

Congo Quartz Mine.—*Chronicle*, Aug. 2: This mine is situated in Negro gulch, near Leavitt's ranch. The main shaft has reached a depth of 100 ft. The ledge, which showed very wide on the surface and was somewhat broken up, has narrowed down to a solid, well-defined vein four ft thick, all carrying gold. Good judges estimate that the ore will average $30 per ton, taking the entire ledge as it comes.

Champion.—An immense over-shot wheel is to be built to run the hoisting gear, and the erection of a 20-stamp battery is to be commenced immediately. The Champion is looking better than at any other period in its history, and the mine has now been thoroughly prospected to the depth of 500 ft.

EL DORADO.

Item.—*Democrat*, Aug. 2: Last Thursday the St. Lawrence mill and mining company closed a sale of their fine 30-stamp quartz mill and hoisting works to the Placerville gold quartz (the old "Pacific") mining company. This is the finest and most complete quartz mill property ever put up in this county. It will be at once removed to the mining ground of the purchasers, on Pacific hill, just south of this city.

MONO.

Tioga District.—*News*, Aug. 2: Tioga district is situated about four miles north from Mount Dana, and adjoins the south line of the Bodie mining district, and in a direct line is 25 miles distant. There are now some 40 mines taken up, principal among which are the Atherton, opened by a cut now in about 20 ft, uncovering a ledge 15 ft in width, which assays well; the Ahwaga, with a shaft sunk some 25 ft, following down on the ledge from the surface, looking well; the Bevan, on which work has been done by means of a shaft now 18 ft in depth, showing a ledge extending the entire width of the shaft, about 10 ft; the Tiposaid, on which no work has been done beyond stripping the ledge cropping out on the surface, which can be traced 1,500 ft in length; the Highrock, adjoining those mentioned above on the west, has a shaft down 22 ft, following a footwall, and in ledge matter, assays from which run from $40 to $200 per ton, mostly in silver; the Industry adjoins the Bevan on the east, and shows fine, large croppings. The formation of the country is porphyry, mixed with quartzite, which is inclosed between well-defined walls of granite, seeming to form a barrier to the outside rock. There can be traced from camp, with the naked eye, a well-defined mineral belt extending north a distance of over two miles, and south one and one-half miles.

Lucky Rodge.—*Standard*, Aug. 1: This mine is on Peak hill, a short distance below and parallel with the Bechtel and McClinton. The ground includes 100x1500 ft, embracing, in addition to the Lucky Rodge, the Kinkead and the Minnie veins. The shaft has been sunk to a distance of 60 ft on the Lucky Rodge, and a drift has been run 12 or 15 ft north from the bottom. The ledge is narrow, but is rich throughout. Extensive works are to be put up on this claim.

Standard Con.—*Standard*, Aug. 4: The west drift, 385 level, is in 300 ft. The ore is good. In the stopes the ledge is from 7 to 15 ft wide, of very fine ore. The winze in the west crosscut, 550 level (incline), is down 47 ft. The upraise on this ledge to connect with the north drift, new shaft, is up 56 ft. The ledge is eight ft wide, of good ore. In the West Standard they are stoping on a ledge 10 ft wide, of very rich ore. They are also stoping in the south drift, 550 level, where the ledge is eight ft wide, of good milling ore, and in the Gildea stopes the ledge is three ft wide.

Red Cloud Con.—The east crosscut, 400 level, was extended 12 ft further during last week, and a ledge was cut, into which has now been cut 12 inches. The ore assays from $15 to $30 per ton. A progress of 12 ft was also made in the west crosscut, same level. On the Packard and Morton vein, from this crosscut, a drift has been started south, which is now in a few ft, and has run under a shoot of ore of very good quality, assays from which go $55 per ton.

Dudley.—The north drift from these workings is now in 167 ft, and the south drift 110 ft.

Noonday and North Noonday.—The north drift on the 200 level has been extended 12 ft during the past week; total length of drift, 327 ft. The combination shaft is now down 215 ft; progress during past week, 15 ft. A station has been cut out during the past week on the 212 level, and a crosscut run west from the station 14 ft.

Defiance.—The shaft has attained a depth of 190 ft, and, following the footwall of the ledge, the bottom is all in quartz. Heretofore the quartz has been found more on the hanging wall, and it has been found by crosscutting. It now appears to have widened out to the full extent of the fissure.

Summit.—The north drift, 200 level, has been advanced since last report nine ft; total length, 310 ft. The ledge is 18 inches wide. The east crosscut from this drift is in 194 ft; progress during the week, 18 ft. The rock is somewhat softer than it has been since starting. The north drift, 300 level, is in 204 ft; progress during the week, 18 ft. The ledge is three ft wide, and looks well. The south drift, same level, has been extended during the week 25 ft; total length, 215 ft. The ledge is two and one-half ft wide.

Bodie Con.—The south drift, first level, is now in 136 ft. The south drift, second level, is in 118 ft. The east crosscut, third level, is in 304 ft. The west crosscut, third level, is in 140 ft.

Bulwer Con.—The south drift, 380 level, has been advanced since last report 15 ft; total length 131 ft. The ledge is two ft wide of good ore.

Blackhawk.—The winze from the 320 level is down 120 ft on the Warren vein, and the ledge shows an improvement. The drift north on the same vein is in 135 ft, and the face looks well. The east crosscut, same level, is in 150 ft, the rock being very hard, with occasional seams of clay.

South Bulwer.—Work in this mine is now confined to the 350 level, where drifts are being run on the ledge and winze No. 2 is being sunk. The latter is now down 30 ft, where the ledge is looking well.

Booker Con.—An average progress of about 15 ft per week is being made in sinking the shaft. It is now down 378 ft, the ground being very wet and working easily.

University.—The new three-compartment shaft is now down 44 ft, timbered the entire distance with 8x8 timbers. A ledge is coming in on the west side the whole length of the shaft.

Double Standard.—The west crosscut has been run since last report 15 ft, total length, 46 ft. The ground is somewhat harder. The east crosscut is now in 46 ft; progress since last report, 11 ft. The ground is hard blasting porphyry.

Richer.—The east crosscut, 266 level, is now in 150 ft, and the formation is of a favorable character. The west crosscut, same level, is in 80 ft.

NEVADA.

Mohican.—*Transcript*, Aug. 1: The Mohican quartz mine, at the head of Gold flat, has been leased to a company of practical miners. The miners were formerly driven out by the water, but the work done in the Thomas mine has furnished it with thorough drainage. The ledge in sight is large and shows well.

Items.—*Foothill Tidings*, Aug. 2: At the Chavanne shaft of the Rocky Bar mine two companies of tributers are at work on the 300 level, and the rock is said to be looking very well. A contract has been let for sinking the shaft to a depth of 80 ft below the 300 level, at which point the drain drift through to the New York hill ground will be started. A contract for running 50 ft on this drift has also been let, and the work started on the New York hill ground. Rube Thomas has discontinued hydraulicing in his claim on the "Slide" for the season, as the V flume requires all of their surplus water to supply the town reservoirs. He will do some work during the summer by drifting in the gravel. The ore now being extracted from the Murchie mine looks better than ever before. It is very heavily charged with sulphurets They have eight Frue concentrators running and save several tons of sulphurets daily. The Shamrock mining company is pushing the erection of the new hoisting works. In the meanwhile the new shaft is being sunk to water level. The Surprise Con. mine, near Allison ranch, contains two locations embracing 2,500 linear ft—one of 1,000, the other of 1,500 ft—the first supposed to be the old Illinois ledge, the other the extension of the Hartery. The locations have been consolidated, and a company formed and incorporated under the above name. The principal place of business is in Grass Valley, and the stock is owned mostly by four persons, who are practical working miners. The company have sunk a shaft on the Hartery ledge to the depth of 92 ft, which is 8 ft in the clear, has two compartments, is well timbered, and is intended for a permanent working shaft. At this shaft there has been excellent pumping and hoisting machinery put in place, and inclosed by a good substantial building, 54 by 33 ft in size. The engine is 24-horse power, the boiler tubular, of 40-inch diameter, and 20 ft in length. The pump in the shaft is 8-inch. The ledge in the bottom of the shaft is about 22 inches in thickness, carrying a good footwall and the hanging wall improving. The ledge shows well in free gold and sulphurets, and it is believed that the quartz taken out of shaft will pay for the sinking of the same. Mr. Seth Brown has recently been prospecting in the region north of Truckee, and reports that outlook very flattering. He picked up one piece of gold worth $15.

PLACER.

Items.—*Herald*, Aug. 2: On the old Shipley lead, about three miles west of Ophir, four practical miners, the Hawkins Bros. and two others, who have been prospecting in that vicinity for some time, have recently made a strike that promises to prove of importance. In a shaft which they have sunk about 30 ft deep, they have a ledge from 18 to 20 inches thick, the ore from which prospects from $18 to $20 per ton. They propose to fit up, and crush their rock in the old Shipley quartz mill. The "Rainbow" drift mine, a few miles above the Hidden Treasure, is panning out fully as rich as any mine in the county. They have a breast of over 40 ft, and the gravel pays not less than $20 per day to the man.

Dutch Flat.—*Forum*, July 31: The Polar Star mine has yielded some very rich nuggets within the last three weeks, so says rumor. The last clean-up made by it, after a nine days run, was over $7,000. It cleans up again today.

SHASTA.

French Gulch.—Reading *Independent*, July 31: F. W. Wheeler is pounding out $50 per day with a hand mortar. The Frank ledge is taking out every day a large quantity of rich quartz from the Niagara. The old Scorpion ledge is turning out some ore. There are four men working on the Sparta ledge, near Slick Rock, running an arastra with fair success. Mr. Heaton says that he and Vandeveer are getting out some good rock from the old Swasey & Dunlap quartz ledge on Middle creek. They have run their tunnel in about 150 ft. The Extra company, at Copper City, are working on some very rich decomposed quartz from Bully hill. Rich placer diggings are also being worked in the same locality. Mr. Cannon a short time ago took out $2,000 or $3,000 out of a quarter acre of ground. Mr. Potter has his new quartz mill on the ground at Spring creek, and will begin to crush ore immediately.

SIERRA.

Wilbourn Con.—*Messenger*, Aug. 2: Work has again been commenced on the Wilbourn Con. mining company's ground, the location of which is about three miles south of Gold lake, what is known as Thompson's ridge, on the same range as the rich diggings recently discovered above Sierra City. The company will put down a shaft in this granite to sufficient depth and then run a drift to strike the channel. A shaft was sunk on the ground two years ago, and the finest of gravel was obtained.

TUOLUMNE.

Items.—*Independent*, Aug. 2: About 100 pounds of quartz ores were shown us to-day, taken from the "Spring Gulch mine," which equals anything in the way of mill rock which we have ever seen in this county. This was sprinkled with gold all through, some of which was very coarse. The portion of the vein from which this ore was extracted was from 5 to 8 ft wide. Near the "Spring Gulch mine" is the "Hunter Con." This has recently had the addition of a new 10-stamp mill, and has recently struck a rich body of ore. The "Starr King" has resumed operations, under the superintendency of Mr. Floyd, and a rich strike of ore has been made in it. The "Soulsby," "Confidence" and other mines are turning out steady and enormous yields. At Groveland a mine near Quartz gulch, Big Oak flat, has struck good paying rock at three different places along the ledge, which is quite large, and some of the rock is very rich indeed, being covered all over with specks and threads of beautiful yellow gold. It is usually pounded out with a mortar, and besides there has been saved up a considerable quantity of milling ore; some of which shows gold, in about every piece, and will pay over $100 per ton. The gulch, which runs along side of this vein, has been one of the richest in California. Mr. McCortea has just completed a cut and tunnel from near the gulch to the vein, about 70 ft, where he has struck rock that prospects very well; has not yet cut through the vein, which, at this place lays quite flat, with a general dip to the eastward towards the gulch. There is a singular phenomena connected with this mine. At the point where the tunnel strikes the vein there is a crevice through which a strong current of fresh, cool air comes up from below, with force enough to blow out a candle when held near it. This current of air is quite cold and pure, and by holding the ear close to the crevice, a soft, musical sound can be heard, like the murmuring of distant waters. Mr. McCortea is also the owner of another mine, on the west side of Big Oak flat, known as the Slate Gulch mine; from several parts of which he has taken good ore while opening the mine, both by shafts and tunnels, and has generally succeeded in making it pay its way. This mine is now bonded to Conde and Savery for $3,000. It was near this mine that McCortea found $380 in gold dust, on the surface near the trail, all in a bunch, about two years ago.

NEVADA.

WASHOE DISTRICT.

North Bonanza and Flowery.—Gold Hill *News*, Aug. 6: Sinking the main shaft is making fair progress. The north drift, 400 level, is nearing the vein and will cut into it diagonally during the coming week. The Flowery crosscut, 300 level, is in a very promising formation of quartz, assaying well.

Union Con.—Two and a half ft per day are being added to the east drift, 1600 level; total length from the main north drift, 152 ft.

Ophir.—A joint Mexican crosscut has been started on the 2000 level in search of the west wall and to prospect the ground in that direction. The joint Mexican winze from the 2100 level is making two ft per day, through blasting porphyry carrying some water. The drift north on this level is averaging four ft per day, through a harder formation of vein porphyry; total length, 82 ft. The incline is now 140 ft on the slope below the 2300 station, and continues in a fine vein formation with streaks of quartz.

California.—The face of the joint west crosscut, 850 level, is in harder rock than formerly and is encountering some water; total length, 532 ft. On the 1950 level the winze from the north end of the ore stopes is down 20 ft in vein material carrying quartz in streaks.

Alta.—A raise is being made from the 1450 to the 1350 level, in ore, to connect the ore bodies on the two levels, preparatory to stoping out.

Mexican.—A crosscut joint with Ophir has been started west on the 2000 level, which is making two ft per day, and will be driven with all speed toward the west wall of the vein.

Gould & Curry.—Three ft per day are being added to the length of crosscut No. 3, 1700 level; total length from the main lateral drift north, 1,063 ft, the face in clay and porphyry.

Occidental.—The lower tunnel has been enlarged and repaired throughout, and from a point 2,434 ft from the mouth a winze has been sunk on the dip of the ledge 110 ft in perpendicular depth, and from a point 100 ft down a crosscut run west 96 ft through a well-defined vein of low-grade ore.

New York.—The crosscut on the 1200 level has passed 100 ft through favorable vein matter and is now in the clay and east casing of the vein.

Con. Virginia.—On the 850 level the joint west crosscut is averaging two ft per day through hard rock carrying some water. The raise from the south drift, 1500 level, is up 25 ft and passing through low-grade ore. On the 1650 level, winze No. 2 will be reached some time this week. East crosscut, 2150 level, is in harder rock than formerly, the face 90 ft from the main south drift.

Julia Con.—The winze from the 1800 level is down 110 ft, and the bottom is in a promising formation of quartz.

Overman.—A drift has been started north on the 1000 level, from the bottom of the winze from the 1000 level, to connect with that south on the 2160 level of the Belcher.

Con. Imperial.—The north drift, 2000 level, is in 555 ft, and passing through quartz and porphyry.

Leviathan.—On the 750 level the south lateral drift is pushing ahead in easy blasting rock with occasional streaks of quartz. The north lateral drift, on the same level, shows less quartz; material in face, hard ledge porphyry.

Caledonia.—The winze from the 1600 level has attained a depth of 258 ft, the bottom in hard rock carrying considerable water.

Lady Bryan.—The north and south drifts, 600 level, and crosscuts from them are all in promising quartz, but of low grade.

Trojan.—The upraise from the east drift, third level, is in low-grade quartz.

Ward.—The shaft has attained a depth of 1,588 ft, and is passing through bird's-eye porphyry, carrying stringers of quartz.

EUREKA DISTRICT.

Eureka Tunnel.—*Sentinel*, Aug. 1: The tunnel is now in close on to 750 ft, the last 50 ft improving in ore indications with each blast.

Silver Connor.—This mine is taking out nothing but ore, and it improves in richness as greater depth is attained. We have been shown some beautiful specimens from the lower workings of this mine—genuine nuggets. Sacks full of very rich ore are now stacked by the mouth of the shaft.

Orange.—The shaft from the end of the 500 tunnel is now down about 90 ft. Two shifts, three men each, are employed, and they raise only such ore as is met with in sinking.

Phœnix.—The Phœnix is in running order, and some ore is being shipped to the Richmond company's furnaces. Several large bins are now well filled with good ore from this mine.

REBEL CREEK DISTRICT.

Ohio Ledge.—*Silver State*, Aug. 2: This ledge situated near Snapp's station, on the Idaho road, was discovered last spring. It has been developed to some extent by a shaft, and is said to be large, rich and well defined. Samples of the ore have assayed from $300 to $2,000 in silver per ton; but it is scarcely possible that all the ore is as rich as these samples.

WILLOW CREEK DISTRICT.

Item.—Paradise *Reporter*, Aug. 2: George White, who has been prospecting in Willow Creek district, returned last Thursday with several samples of ore from a ledge he located there. The samples were left with Judge Harlan for assay, and after the test showed an average value of $301.78 in silver per ton.

ARIZONA.

Items.—*Arizonian*, July 30: We have the best of news from the Tiger mill and mine, in Bradshaw mountain, about 40 miles south of Prescott. A private letter recently received states that $40,000 in silver bullion, ranging from 830 to 935 fine, had been shipped. The working shaft is now down about 300 ft. People say the mill is the most perfect ever set up in Arizona. The placer mines of Clifton, Apache county (or more properly the newly-discovered gold region in the southern part of the county), are proving to be immensely rich. Miners are flocking to the new placers, and 23 claims were recorded in one day. Two men have a claim from which it is estimated that they are taking out, at the least calculation, $1,000 per week. In Pinal county the Santa Catalena district improves. Several assays have been running as high as $2,800 in gold from rock taken out of the Highland Mary lode, which is in the Santa Catalena mountains, about 65 miles southeast of Florence. Plenty of wood and water all over the district. In Big Bug district, quartz and placer miners are hard at work. The Tiger mill, on Turkey creek, is running on good ore. The Southern Belle lode is realizing ore at $00 per ton, worked by the arastra.

COLORADO.

Summit County.—*Miner*, July 20: Carbonates have been discovered on Gibson hill, which is between French Gulch and Gold Run. Six or seven shafts have been sunk, and one tunnel is being run. The Superintendent reports that they are taking from the tunnel daily not less than 30 tons of ore. Good mines have been struck between Breckenridge and the range. Sam Conger has sent down 112 sacks of silver ore to Denver, 120 pounds bringing him at Argo $32.80. This ore was from a point three miles from Breckenridge southwest from the road. F. J. Ebert has struck good ore opposite Conger, between Indiana and Illinois gulches. Wannemacher has got good ore between Conger and Pennsylvania gulch.

Peru District.—Cyphers & Mendenhall have struck a lode from which they are taking ore that assays from 1,700 to 1,900 ounces. They have stripped it over 100 ft in length and exposed from 8 to 18 inches of mineral. Other strikes are being made on Cooper and Ruby mountains. Old prospect holes are being sunk down and are showing good ore. The old black quartz in these lodes is running from 75 and 80 to 100 ounces. The new town will probably be near Commodore Decatur's old cabin. The lodes are large fissure veins, low grade on the surface, which improve rapidly as depth is gained. As it is only 14 miles from Georgetown it is easily accessible.

Ten Mile.—On the Sheep mountain, in the Kearsarge, 7 ft of mineral have been exposed on the face, and at a depth of 5 ft there are no indications of bottom.

Gunnison & San Juan.—A gold lode was discovered a

[Continued on Page 92.]

Deep Mining on the Comstock.

We publish this week the address of Prof. John A. Church, on "Deep Mining on the Comstock," delivered before the Bullion Club Thursday night, June 19th. In preparing for the Government his report upon these mines, he had good opportunities to study the questions which he discussed; and from the careful manner in which he does all of his work, his views will be eagerly read by many of our readers:

For many years, engineers have discussed with much interest the subject of deep mining, the point in question being the greatest probable depth to which the earth's crust could be penetrated. Opinion settled with considerable uniformity upon 4,000 feet as the limit to which the existing conditions of labor and machinery would allow mining to be carried with profit. No mine has reached that depth, and the question was really no more than a theoretical one until the appointment of the famous British Commission for inquiring into the probable future of the coal supply. In that investigation, the depth to which the earth's strata might be robbed of their coal was necessarily an important item.

But it appears to be reserved for America to put this important question to the first practical test, and under circumstances which are undoubtedly the most notable and interesting in our mining annals.

The past 20 years have witnessed the discovery in our country and the growth of the most important mines of silver and gold known in the history of the world, with one exception. Potosi, in South America, is said to have produced $600,000,000 from its mines, while the Comstock lode in Nevada has yielded but little more than half that sum. But at Potosi there were more than 30 principal veins, while in the Comstock region all but 2½% or 3% of the product has been collected from a series of 15 or 16 large masses of ore lying in close juxtaposition to an eruptive dike about four miles long, and forming one homogeneous lode. This wonderful series of deposits has supplied no less than 2⅓% of all the gold and silver that have been extracted from the whole earth since the voyages of Columbus; and if any other lode has a record that can be compared with this, I have not been able to find it.

It is difficult to arrive at the true product of the Comstock mines; for they were opened at a time when statistical matters were but little valued in the West. At that time, when the bullion was obtained, little attention was paid to accounting for it to the world. Now a different state of things exists, and careful records of mining and milling operations are kept; but the early period unfortunately covers just that part of the lode's history in which the rich top-rock that occurs in most veins was worked, and the confusion then introduced can never be removed from the statistics of its yield.

After going over the numerous and somewhat contradictory authorities as carefully as possible, I have summed up the entire product of the lode from 1858, the year of its discovery, to the end of 1878 at $291,171,605. This represents only that portion of the yield which was accounted for to the stockholders; and to ascertain the true yield of bullion, some addition must be made for the product from tailings and battery slimes, both of which, by Western custom, are perquisites of the mills. It is obviously difficult to learn the true yield, or estimate fairly for these items; but if they are supposed to yield $5 per ton of ore, and the quantity of ore is 6,500,000 tons, they will represent a product of $32,500,000. This brings the whole yield of the mines to $323,671,605. Finally we may add $40,000,000 to this sum for the losses in working, and the account with the mines will stand about as follows:

Duration of mining	20 years
Number of bonanzas	16
Tons of ore extracted	6,500,000
Value of ore per ton, nearly	$56.00
Yield in mills	44.80
Yield from tailings and slimes, per ton	5.00
Lost in tailings, per ton	6.00
Total value of ore	$363,671,605.00
Yield in mills	291,171,605.00
Yield from tailings and slimes	32,500,000.00
Lost in tailings	40,000,000.00

In every aspect from which these mines are viewed, they are remarkable. They have been the most productive of bullion; they are the hottest excavations which have been made in the earth's crust; they are the deepest openings on the American continent, and are rapidly becoming the deepest in the world; and finally, their fortunes fluctuate between the absolute extremes of dividend and assessment, of rich bonanza and barren horrasca, with a rapidity that has no parallel in vein mining. Such an array of superlatives in description may be thought to defeat itself, but every one of them is strictly true when applied to these mines. The last of these items covers the most important characteristic of the lode, and its accuracy is well exhibited by the recent history of the mines.

In 1873, two mines in Gold Hill—the Belcher and Crown Point—were in bonanza, and continued in active production for three years longer. In that year, another discovery was made, nearly a mile north of these mines; but with this exception, the whole lode has been absolutely barren of new discoveries from 1873 to 1878, though work was vigorously prosecuted along its whole length of four miles. This work has covered a depth of probably 700 or 800 feet, and in some portions much more than this; but, with the exception spoken of, no discovery was made in the period of five years. Yet, with all this hard fortune, the Comstock never produced so much bullion, never paid such large dividends, and never showed such a profit over expenses as during this very period.

The reason of this is, that the single discovery mentioned developed into a series of ore bodies that, by the end of 1878, had yielded no less than 37% of the whole Comstock product. The ore was richer, the percentage extracted higher, and the profits greater than ever before known.

Such facts illustrate the peculiar characteristics of this great lode, and I have brought them to your notice because the chances of deep mining in that region are largely governed by this peculiarity. The ore bodies, whose great wealth made 1,200 feet of ground more productive than the whole lode had ever been before in an equal space of time, are now so far exhausted that their immense profits have ceased, though they continue to supply large quantities of poorer ore. New discoveries have been made in their neighborhood, and ore is now extracted from them, but their magnitude and value are unknown to the public. So far as trustworthy public information goes, the whole Comstock lode is to-day a ground for assessments, but not for dividends of importance.

It is under these circumstances that the managers of the mines have prepared for exploring the lode at depths which approach the limits that have long been considered practicable for working in the earth's crust; and it is under these circumstances that I am to speak to you of the chances which this deep mining will have. I will begin with the announcement that I consider those chances just as good as they ever were at shallower depths, and go on to offer to you my reasons.

I have told you that the Comstock lode consists of a number of independent ore bodies disposed upon an eruptive dike. The dike runs north and south and dips toward the east, and the ore bodies imitate it in both respects. The earliest workings were upon the outcroppings of quartz; and as successive depths have been reached, a series of hoisting shafts has been sunk, each one being placed eastward of its predecessor. Four lines of these have been established—one at the outcrop, one reaching to a depth of 500 or 600 feet, and one attaining a depth of 1,000 or 1,200 feet. This is the line which has been in use for the last 10 years. Finally, in the fourth line are placed those deep shafts of which none has reached the lode, and the future prospects of which form the subject of my remarks.

These are six in number: The Union shaft, 1,500 feet east of the present line; the C and C shaft, so called because it is the joint property of the California and Consolidated Virginia mines; the Requa shaft, sunk by the Savage, Hale & Norcross, and Chollar-Potosi companies, and named from the Superintendent of the last-mentioned mine; the Taylor shaft, sunk by the Yellow Jacket, Kentuck, Crown Point, and Belcher companies; the Forman shaft, sunk by the Overman and Caledonia companies; and the Oshiston shaft, sunk by the Gould & Curry and Best & Belcher companies. These are advanced from 2,500 to 4,400 feet east of the present line, and they are expected to reach the lode at depths varying from 2,500 to 3,500 feet. From the junction, inclines will be sunk on the dip of the lode, which may carry the workings 1,000 feet farther in depth. The northern or Virginia end of the lode will have four and the southern or Gold Hill end will have two deep shafts.

In every respect, the appointments of these shafts are suited to the great work expected of them. The hoisting and pumping machinery is of the most powerful construction, and the work of sinking is prosecuted with great vigor. Their position is such that the North Consolidated Virginia shaft, together with the Oshiston, Requa, and Taylor shafts, forms one line, 2,500 feet east of the present line of works, and covering 12,000 or 14,000 feet of the lode in which is found its most productive portion.

Turning now to the immediate object of our inquiry, it is not to be denied that the long-continued barrenness of 18,000 feet of ground that was once productive has awakened serious doubts of the permanent character of Comstock mining; and while engaged in a careful examination of all the mines, I made the question of future probabilities one of my principal subjects of inquiry. I found that no ore body on this lode has been discovered from the workings in another ore body. In the Chollar-Potosi, several important bonanzas were included in a great mass of quartz, and one or more of them were discovered in the manner which I have described. The same is true of the California and the smaller Consolidated Virginia ore body; but I have learned to look upon such groups of ore bodies as mere parts of one great bonanza, and the assertion I have made is true when applied to the case of bonanzas which are strictly independent. They are not connected by stringers of ore, nor do they overlap in any way that makes it possible to feel for one from the known position of another. Entirely disconnected, they are surrounded on every side by barren ground, and this often reaches upward and downward and on both sides for hundreds of feet.

In an ordinary fissure vein, where a rich part of the ground is worked out, there often remains a steady supply of poorer ore from the main filling of the vein. But this is not the case on the Comstock. When the true bonanza is exhausted, large quantities of poor ore are often scraped up from the corners and sides of the great mass; but in time this also fails, and the miner finds his excavation surrounded by country rock on all sides in a fashion that veins do not exhibit. The quartz once removed, nothing like a vein remains, and the ground beneath him resembles perfectly the rock that stretches for miles on either side.

In a lode of this kind, barrenness for 500 feet no more proves the exhaustion of the lode than barrenness for 100 feet of depth. These bodies of ore lie in a thick mass of layers composed of eruptive rock. At a certain period, an immense quantity of another eruptive rock was poured out upon them as they stood in their inclined position. It loaded them with such a weight that they began to slide upon each other, the upper layers sliding upon the lower, and the movement must have been accompanied by crushing and breaking of the layers on an extensive scale.

Into these crushed portions and into the opened seams of the rocks poured a stream of water, bringing with it quartz, gold and silver; and these were not only deposited in the crevices, but the solid rock was itself dissolved, and metalliferous quartz was left in its place by the process known to geologists as substitution.

Ore bodies formed in this way may be in the near neighborhood of each other, but they may also be far removed and have no other relation than that they occupy the same line of crushing and movement. Mining on the Comstock has gradually adjusted itself to this condition of things, and it is rare to find an effort made to follow up what in other mines would be considered good indications of metal. If an ore-bearing seam is found, its character is carefully ascertained, however insignificant it may be; for the bonanzas always begin in a small way, whatever proportions they may reach afterward. But in general exploration, the system pursued is to cut through the rock layers at points sufficiently near to make sure that no important ore body can escape early discovery. Irregular as the Comstock ground is, the work upon it is more uniform than is common in metal mines.

I have brought these points before you to show that the present state of things is nothing new on the lode. At all other times, some of the mines have been in barren ground, and the only thing remarkable in the existing condition is the vertical and linear extent of this barren ground. It covers nearly the whole length of the lode for perhaps 600 feet of depth as a minimum. This is unpleasant and not profitable; but I cannot acknowledge that it is proof of exhaustion.

From the facts given, you will see that the question is really brought down to one point. The ore bodies exist because certain parts of the ground were opened and crushed by a weight laid on the surface. The almost uniform cessation of ore at a given depth might well give rise to the suspicion that the force mentioned was exhausted in the work it did upon the rock at higher levels. The geological aspect of the question may, therefore, be expressed by the question: "Was the weight to which the lode owes its formation sufficiently heavy to extend its effects to depths greater than 2,500 feet, which we may assume to be the greatest present depth of the mines?"

I think no observer, who will go upon the ground and search out the boundaries of the vast mass of rock that compose this weight, will imagine that its effects can be confined to the shallow depth named. Indeed, a visit to the ground is not necessary. The condition of the ore in the great bonanzas gives strong evidence against the supposition. All the ore taken from the lode, with exception of scattered bunches, the outliers of the bonanzas, and with exception also of that now mined in the Ophir, Union and Sierra Nevada, has been found above the 1650 level. A hundred feet above that point, the effects of the weight were so tremendous that an ore body 200 feet thick was formed in the mass of rock which its action shattered. It is evidently impossible to suppose that such results were obtained by the operation of a force that was fast reaching the end of its powers. It would be singular if the greatest effects were exhibited in the decline of the forces that produced the ore bodies; and the idea that the Comstock is exhausted must be rejected on the mere statement of the conditions which the latest bonanzas exhibited.

During the past 18 months, repeated accounts of the discovery of ore in three mines—the Ophir, Union Consolidated and Sierra Nevada—have been made public, and the mills are now crushing ore from one or two of these mines. I believe these discoveries were made about 600 feet below the 1650 level, and it is possible that the continuance of the Comstock as a producer of ore in depth may be decided already in the affirmative. But leaving out of consideration these discoveries, of which I have no definite knowledge, and confining our attention to those facts which were known and capable of scientific examination in 1877, it must be acknowledged that below the 1600 level all the mines but one, or possibly two, were barren for a depth of 600 feet, and most of them for as much as 800 and 900 feet, and even more. If the sources of the ore and the forces which placed it in position were existing in undiminished vigor, as it is my purpose to impress upon you, there must be some other antagonistic cause in operation which has prevented the formation of ore bodies at this particular depth and produced a barren zone.

Such a change of conditions is discernible, and though a complete retrospect of the mode in which the great lode was formed would occupy too much time, I can point out to you one of the most striking facts which the study of the lode has brought out.

Through the whole Virginia section, and also in a large portion of the Gold Hill ground, the ore-bearing portion of the lode has had a very steep pitch. Angles of 45°, 50° and 60° were common. The great bonanzas may be said to stand vertically; for, while they dip throughout their whole hight, this dip is both east and west on alternate levels, and the result is not far from perpendicularity. The characteristic of the productive ground then is steep dip.

Barren ground is marked by just the opposite peculiarity, and wherever the dip has flattened, whether near the surface or at a great depth, the flattening of the lode has been followed by cessation of ore. Very marked instances of this are shown in the Yellow Jacket, Gould & Curry, and other mines. This is precisely the state of things now found in the existing great barren zone, and to this flattening I trace the disappearance of ore. There is no reason to suppose the change a permanent one, or to deny the probability of ore making a gain in depth just as it has repeatedly made at higher levels when flat dip has been followed by a steeper inclination.

It is on account of this flattening that the new shafts have been placed so far to the east. Whether the distance selected, about one-half mile, has been sufficient, must be proved by the results; but the conclusion to which the history of the lode necessarily leads us is, that, if they find the lode increasing in dip at the point of their intersection with it, the prospects for a line of bonanzas on a new front removed half a mile from the old one will be just as good as if it were one or two thousand feet nearer the surface. The added depth is not likely to decrease the results.

But the theoretical probabilities of finding ore are not the only elements in the problem of constructing these deep shafts. New conditions have come in—new not only on the Comstock but novel in the world. In the first 1,000 feet of depth, the mines were often close and hot, and the ventilation poor. Since that was worked out, the ventilation has been so improved that the works would be quite comfortable if the rock had remained as cool as it was above. But it has become hot, and is steadily growing hotter. The men work in an atmosphere of 108° to 112° in a great many drifts. The rock at the 2000 level is 130° Fahr., and, ominous of future event, water of 156° Fahr. has entered at least one of the mines.

At the same time, the quantity of water in the rocks has increased. A well 2,500 feet deep will drain a large territory; and when, from the bottom of that well, a gallery is run two miles each way, north and south, and at numerous points in its course, other galleries are cut through the rocks, quadrupling the length of the main drift, the whole network forms a drainage system vast in extent and of the most perfect arrangement.

Already the mines are raising not less than 4,500,000 or 5,000,000 tons of water a year, and the upcast shafts through which the air-current leaves the mines send out a whirling column of vapor 40 feet high. Will the water increase so as to make mining unprofitable, or the heat increase so as to make labor impossible in these deep shafts?

The popular fancy is more impressed by the striking effects of the heat, but the water problem is probably the more serious of the two. An excellent system of ventilation, closely adapted to the conditions of work in heated air has been devised, and is capable of further expansion. The heat will probably increase, but its effects can be guarded against sufficiently to make work in the next thousand feet of depth more comfortable than it has been in the last thousand. Much as our sympathies may go out to men who have to work in these hot galleries, their efficiency as miners proves conclusively that the conditions of their work are not startlingly oppressive. With all their disadvantages, they accomplish as much in a day's work as the best average miners. This efficiency will not be lightly lost. Every few months witness improvements in ventilation, and it is probable that the arrangements at the new shafts will more than compensate for the greater heat which they must expect to encounter.

When we study the subject of drainage, we at once find ourselves in the presence of much more serious conditions. The vast ramifications of the mines, extending more than 200 miles in aggregate length, and increasing probably 12 miles each year, form a drainage system that must collect the local rainfall very thoroughly. Fortunately, the quantity of this is not great; but the rocks also contain immense stores of water, from which the pumps are constantly drawing as the deepening of the mine taps one reservoir after another. Whether the annual supply of 5,000,000 tons is drawn entirely from these two sources, or is maintained partly from water channels that tap distant and exhaustless stores, can not be determined now.

Virginia stands about 1,500 feet above Carson plain, and the mines are already nearly 1,000 feet deeper than Carson river, four miles away. It is not at all improbable that the drainage of large areas which would discharge into this and other channels may be diverted to the mines. The drainage of the mines is already more difficult and expensive than their ventilation, and its difficulties are likely to increase more rapidly with depth. The completion of the Sutro tunnel will give the mines a new lease of life, and improvements which are always possible in

mechanical appliances will further lessen the cost and labor of drainage.

When the present working shafts were decided upon, they were thought to be very formidable undertakings, and it was supposed they would suffice for the work of the lode for many years. But the vigor with which the ground has been worked has reduced their life to ten years. They represented an advance of about 600 feet in depth in the vertical shaft. The new line represents an advance of, at least, twice this increase in depth. No one can pretend to anticipate their history; but it has been my effort to show you that their prospects are good, though they are begun after a continuance of disappointment quite unprecedented on the Comstock and an expenditure of assessments entirely unexampled in the history of mining. Their fortunes depend on three factors: the finding of ore, the control of drainage, and the possibility of work in the increasing heat of the rock. I think that a careful examination of the lode and of the mining upon it would discern encouragement in all these respects. The lode in depth bids fair to be precisely what it was nearer the surface, and the unknown quantity is really the exact depth at which the great barren zone will end.

Miners' Law.

The customary law of miners, as stated in the opinions published in our last issue, is not applicable in California to controversies arising between them, or ditch owners, and occupants of the public lands for agricultural or grazing purposes. It has been the general policy of the State "to permit settlers in all capacities to occupy the public lands, and by such occupation to acquire the right of undisputed enjoyment against all the world but the true owner."—Tarter *vs.* Spring Creek Co., 5 Cal., 398.) But at an early day an exception was made to this policy in cases where the interests of agriculturists and of miners conflicted. By an act passed April 20th, 1852, a right of action was given to any one settled upon the public lands for the purpose of cultivating or grazing against parties interfering with his premises, or injuring his lands where the same were designated by distinct boundaries, and did not exceed one hundred and sixty acres in extent, with a proviso, however, that if the lands contained mines of precious metals, the claim of the occupant should not preclude any persons desiring to do so from working the mines "as fully and unreservedly as they might or could do had no possession or claim been made for grazing or agricultural purposes."—Statutes of 1852, p. 158.)

Under this act the Supreme Court of the State held that miners, for the purpose simply of mining, could enter upon the land thus occupied, but that the act legalized what would otherwise have been a trespass, and could not be extended by implication to a class of cases not specially provided for. Accordingly, ditches constructed over lands thus held, without the consent of the occupant, though designed to convey water to mining localities for the purpose of mining, were held to be nuisances, and upon the complaint of the occupant were ordered to be abated.—(Stoakes *vs.* Barrett, 5 Cal., 37; McClinton *vs.* Bryden, Ibid., 97; Fitzgerald *vs.* Urton, Ibid., 308; Burge *vs.* Underwood, 6 Id., 46, Wermer *vs.* Lowery, 11 Id., 104.)

Since these decisions there has been some legislation in the State, permitting water to be conveyed, upon certain conditions, across the lands of others. Such legislation, if limited to merely regulating the terms upon which possessory rights subsequently acquired on the public lands in the State may be enjoyed in the absence of title from the United States, may not be open to objection.

Gold in South America.—In French Guiana gold diggings commenced in 1856, and in the next six years about 13,120 ounces of gold were procured. A few years later the Dutch settlers began to work the gold-fields in their colony, and in the next two years ending 1867 gold to the value of £25,000 ($125,000) was exported to Amsterdam. In the meantime still greater progress has been made in Venezuelan territory adjoining. In 1869 about 20,000 ounces of gold were obtained there, and the introduction of improved machinery during the last ten years has largely increased the output. Large numbers of Cornish miners, of miners from California and British Columbia, and laborers from the different West India islands have been attracted to these fields; and now it is reported from Surinam and Cayenne that rich veins of gold have been found simultaneously in several parts of the auriferous area which bid fair to eclipse the wealth of both California and Australia. One man, it is stated, in four weeks gathered upwards of 40 pounds weight of gold, with little labor, and similar instances of the abundance of the metal are numerous. A regular rush has been made towards the diggings, and it is feared that complications may ensue, if precautions are not promptly taken, in consequence of the conflicting claims of English, Dutch and French settlers, of citizens of the Venezuelan Republic, and of the native tribes. Although gold has not been actually worked in British Guiana, its existence in the interior has long been suspected, and even ascertained; and the fresh discovery must have important influence on the future of the colony. Unfortunately the limits of the British colony and the Venezuelan Republic have never been accurately defined, constant disputes occuring in consequence.

Useful Information.

Embellishing Metallic Plates.

The decoration of sheet-iron or of tin or terne plates by printing with colors, by lithogalvanography, and by stamping is considered to be defective whichever is used, so that in the opinion of Messrs. Trottier & Co., of Hennebont, France, a blank remained to be filled up in order to supply the numerous manufactures employing sheet-iron and tin with a product which, while presenting essentially a decoration suitable for the article for which it is intended, offers great resistance to the tools with which it is to be made, and will bear the usage to which it will be subjected. Such is the object sought and which is believed to be fully attained with the novel products forming the subjects of this invention. These products, which it is proposed to term "litho-plastic iron and tin," may in fact be applied to all purposes of manufacture. The plates of iron or other metal having been polished and grained, are submitted to lithographic printing with inks non-saponifiable by acids, amongst others those having a base of wax, linseed oil and asphaltum, or linseed oils vulcanized by the action of azotic acid, or made so that they cannot be attacked by acids by means of an addition of Jews pitch, and two or more solutions of concentrated india-rubber.

The object or impression being obtained, the parts not covered by the fatty inks are bitten in or deepened by chlorhydric, sulphuric, nitric, or nitrous acids, pure or diluted, or by any other body capable of forming with the iron a soluble combination, or by the aid of an electric current in bathe suitable for this work. The duration of the action necessarily varies with the relief which it is desired to obtain and the nature of the dissolvents used. The fatty inks which have formed the reserves are then removed either by heating the plates or by dissolvents of the fatty matters. In this state the iron is submitted either to ordinary tinning or to galvanizing, or to any kind of galvanic deposit, according to the use for which it is intended. The electro-chemical deposits may be applied as reserves, this application being based upon the property possessed by certain metals of not being attackable by acid, whereas the same acids act upon iron. The same lithographic composition will then give an object or impression the reverse of that obtained by the previously described process.—*Mining Journal Sup.*

Dyeing.—A new process, by which novel effects may be produced upon textile materials, has been introduced by MM. Gillett & Son, Lyons. The thread or textile fabrics are first dyed black by any known process, and are then treated with gelatine or albumen, and allowed to dry. After this, the materials are placed in a bath (more or less dense) of color obtained by the distillation of coal, and vaporization is then affected either in a wet or dry condition, according to the effect which it is desired to produce; after these operations the materials are washed. The threads or fabrics thus dyed are then ready to be submitted to the operations of drawing, lustering, calendering, pegging, and other manipulations intended to increase their brilliancy. The treatment of the threads or fabrics with gelatine or albumen may be dispensed with, but without them the coloring matters will not be so well fixed, although they may be brighter. Good results and different effects may be obtained by placing the materials to be treated alternately in baths of logwood and of acetate of copper. The same colors obtained by the distillation of coal may also be employed, not only for materials which have first been dyed black, but for those which have been first dyed with colors more or less dark. For instance, a fine effect may be obtained by the application of aniline violet on French blue; or quite a different effect may be produced by the application of such colors on chestnut or other shades of brown.

Stop-Cock of Easy Construction.—Take two glass tubes, one of which slides easily into the other, close the end of the smaller tube in the flame of a Bunsen's burner, and make an opening about an inch from the closed end by filing crosswise with a rat-tail file. Connect the two tubes by a piece of rubber tubing, which should fit the smaller tube closely, and the stop-cock is complete. When the smaller tube is pushed into the larger one the cock is open; when shoved back into the rubber tube the opening in the small tube is covered by the rubber wall, and the passage of liquids or gases prevented.—*Edward Hart.*

Restoring Steel.—A German magazine gives a simple method of restoring burned steel to a workable condition. This consists in immersing it in a preparation made by melting three parts of pure rosin in a crucible, and after it has become perfectly fluid, adding, with continued stirring, two parts of boiled linseed oil—care being taken to prevent the mixture taking fire, of which there is danger should the temperature be too high.

The electrical resistance of pure water, according to the experiments of Messrs. Exner and Goldschmidt, decreases uniformly as the temperature rises. At 99° C. (= 210.2° Fahr.) it is only one-third of what it is at 20° C. = 68° Fahr.) A similar result is observed with water acidulated with sulphuric acid.

Preparing Metal Sheets and Wire for Coating.—A special improved process of treating metal previously to its being coated with tin, lead or zinc, has been invented by Mr. Conway, of Pontnewydd, near Newport, England. The present method is to subject the iron, steel, or other metal, to a bath of sulphuric acid, but Mr. Conway's invention does away with the use of acid, and substitutes carbon or hydrocarbon, either in the form of vegetable or mineral tar or hydrocarbons, which may be applied mechanically or by manual labor, but he finds it advantageous to employ a machine by which plates by means of rollers are passed through a bath containing the carbon to be used, thus doing away with what is technically known as "black pickling" in the manufacture of tin and terne plates. After passing through the bath the plates or metal of other forms go through the usual process of annealing, cold rolling, white pickling and tinning, as is well understood.

A convenient mode of testing dynamite, sufficiently exact for practical purposes, is the following, recommended by the *Chemiker Zeitung:* Dynamite, as our readers are aware, is simply an infusorial earth, which is saturated with nitro-glycerine, and the explosive energy of a sample will depend upon the quantity of nitro-glycerine it carries. For this purpose, a weighed portion is taken and treated with ether, which dissolves out the nitro-glycerine, leaving the inert infusorial earth unaffected. The difference in the two weighings will give the percentage of the explosive present.

Sulphate of Baryta.—The mineral was scarcely known or used in Europe 50 years ago, but the Chinese have used it in the manufacture of the finest description of porcelain, and also for agricultural purposes, for thousands of years, and it appears its application in the growth of certain crops is marvelous. Capt. Thomas, of Cappagh, Ballydehob, we are informed, after a long and patient investigation of the subject, has discovered a fertilizing manure of astonishing power, the principal ingredient in which consists of a preparation of the sulphate or baryta.

Flax vs. Silk.—Considerable excitement has been caused in Lyons, France, by a discovery which purports to give to flax all the qualities and appearance of silk. It has long been known that silk is soluble, not only in powerful acids, but also in soda and chloride of zinc; and it is said that these qualities are made use of in the new process. A company is being formed, with a capital of $6,000,000, for the manufacture of the new textile.—*Iron Age.*

Good Health.

The Treatment of Neuralgia.

Aconite is an old remedy in neuralgia, which has, however, not altogether realized expectations which were formed of its value. The power which it often lacks has been lately claimed for its alkaloid by Prof. Guhler, who announced that aconitia is almost infallible in trigeminal neuralgia. This substance was long banished from materia medica for internal use, but it has been employed occasionally since the discovery of a crystallized form by Grehaul and Duquesnel in 1671. Its value in neuralgia has lately been investigated by the New York Committee on Neurotics, of which Dr. E. C. Seguin is the chairman. The dose of all forms of aconitia is about the same, the initial dose being about half a milligramme (1-130 grain) twice or thrice a day, Guhler states that the dose of amorphous aconitia may be gradually raised to half a centigramme, but Duquesnel's preparation has to be given with greater caution. There are, however, differences in susceptibility, and some persons cannot bear a larger dose than 1-200 of a grain; while one case was met with in which 1-84 of a grain every three hours was tolerated.

From a trial of the treatment in a series of cases, the committee conclude that, on the average, distinct physiological and therapeutical effects may be obtained by giving 1-100 of a grain three times a day. Of six cases of severe trigeminal neuralgia, one, probably a reflex neuralgia from a decayed tooth, was not at all benefited. Three cases of epileptiform neuralgia were slightly or only temporarily relieved. Two cases were cured. One of these had existed for seven years, with an interruption of seven months, procured by resection of the affected nerve. The results thus afford a partial support to M. Gubler's assertion.

The value of ammoniacal sulphate of copper in the treatment of the same affection has been asserted by M. Fereol in a recent communication to the Academie de Medecine. He states that in cases in which every treatment has failed, even the administration of gelseminum and aconitia, a cure or remarkable relief may be obtained to the most severe symptoms by this drug. Among the examples he gave of its use was the following:. Trifacial neuralgia of two months' duration, with absolute (?) insomnia, was unrelieved by the extraction of teeth, quinine, bromide, aconitia, or tincture of gelseminum, hypodermic injections of morphia, or arsenic. From the first day of the administration of the ammonia sulphate of copper there was a notable remission in the symptoms and cessation of the insomnia. In one case the dose was pushed to eight grains without any other accident than nausea. It has the drawback of occasioning a persistent metallic taste in the mouth. Only one case of intolerance was met with; in that a grain and a half of sulphate of copper occasioned violent vomiting.—*Lancet.*

Recreation.

"All work and no play
Makes Jack a dull boy."

Poor poetry, but right good sense. As a people we need more recreation. We are desperate workers. Many of us are wasting our vital forces at a fearful rate, without taking sufficient measures to re-create them; a balance in bank subject to such drafts will soon be overdrawn. We must keep it good with fresh deposits or we shall soon have an awkward account on our hands to settle. Enough to eat but no appetite, nervous headaches, sleepless nights, heavy doctors' bills, expensive visits to "the springs," doleful company, regaling their friends at breakfast, lunch, dinner and "between times" with their doleful symptoms, will all be in the bill to foot. Better learn to be happy, instead of miserable, at less cost. But a noted English physician has just been telling the world, through the *Gentleman's Magazine*, that we must learn to turn work into play and play into work. It is drudgery that wears. We need to take pride and delight in our work, get up a little enthusiasm that turns it into a good game of skill. The workman shoveling rock on the macadam, or mixing the bed of mortar, ought to be able to say when he is done, "That's a first-rate job; beat it who can?" Then no less than the painter or the poet he feels the stimulus of an ideal. Every stroke is a pleasure and as he looks back on his finished task honest pride and a good conscience are like lingering music in the soul. On the other hand nothing is more dreary than the effort to be amused. A more pitiable sight rarely pains the eye than the "gentleman of leisure" who has plenty of money and nothing to do but play. He bangs heavily on himself. Killing time kills the killer. To live well we need to learn to work sportively and play in earnest.—*Work and Play.*

New Diseases.—Prof. Winckel, the director of the Royal Lying-in Institution at Dresden, has reported to the Congress of Children's Doctors, lately held in Berlin, observations upon a mysterious children's disease, which he had an opportunity of clinically studying in his own institution. An epidemic broke out toward the end of March. Of 23 children attacked, 19, or 82% died, and the average duration of illness in the fatal cases was 32 hours. The illness began with a sort of sudden stupefaction of the children. The respiration became hoarse, accompanied with groaning and occasional foaming at the mouth. The change in the blood was remarkable. Dr. Winckel made incisions in some cases, but it was only by using pressure that he was able to squeeze out any blood. It was a thick, brown-black fluid, of the consistency of syrup. The body became flacid, the liver much swollen; presently convulsions supervened, during one of which the child expired. The President of the Congress, Privy Councilor Dr. Gerhardt, of Wurzburg, suggested that this new disorder should be designated "Winckel's disease." Another disease has become apparent in the heart of a very crowded portion of London. It is a new form of Cyprus fever, and a diagnosis of a recent malignant case shows the patient to be suffering from hallucinations and lowered vitality. The faculty ascribe the disease to impure water, and have given it the name of detephobia, and, though it is seldom fatal, the sufferer remains but a shadow of his former self.

Blackberry Root Good for Summer Complaint.—We have great faith in a decoction of fresh blackberry root for looseness of the bowels. Last summer it completely cured a severe case of chronic diarrhœa, after the other remedies of the best physicians had proved unavailing, and it invariably cured in many other cases where it was afterward recommended. Dig the green roots, rejecting those that are large and woody. Wash thoroughly clean, and steep in water at the rate of a quart to half a pound of the root, boil down one-half and then strain or pour off. Put the liquid in a bottle with about one-eighth of its bulk of brandy, whisky, or alcohol, to keep it from souring, and cork tight. A tablespoonful of this, rather less for a child, is to be taken three or four times a day, say before each meal time. We would not go from home, especially southward, without taking this preparation along. The blackberry brandies or cordials made from the berries are of little account as remedies for the diarrhœa. The virtue lies in the roots, not in the berries.—*Agriculturist.*

Carbolic Acid Inhalation.—The inhalation of carbolic acid spray (two per cent. solution) in phthisis has been tried in the Mount Sinai Hospital, New York. The first case had fetid expectoration, with an average temperature of 102½°. The first effect of the inhalation was to increase to a marked extent the sputa, but at the same time to check the fetor. The most important effect of the inhalations was to decrease the temperature from 102° to 101°, 100°, and 99°. In some of the cases carbolic acid acted as an irritant, giving rise to considerable spasmodic effects, and in these cases salicylic acid was substituted. The latter agent did not produce such a decided effect on the temperature, but its action on the fetor was equally marked.—*Medical Times.*

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The Week.

Mining in the field, without startling developments or other cause of excitement, is everywhere making good, and in some localities very rapid progress. In some portions of Trans-Sierra California there is an unusual activity. The mineral belt, reaching from the headwaters of Walker river south for a hundred miles or more, including the Bodie, Dunderberg, Esmeralda, Alpine, Lake, and other districts, is becoming a very attractive and lively mining region, the importance of which seems to grow with the explorations made along it; while the fine gold-bearing ores and the bullion product of the Bodie district have earned for it a well-deserved notoriety. There are other mining centers along this belt that promise to develop, under active exploitation, a wealth nearly as large and quite as permanent as Bodie. On the upper confluents of the main Walker, some rich gold veins are being opened. The Dunderberg mine, lying near the West Fork of that river, is a property of immense value, idle now by reason of the financial troubles of the principal owner. In the big prospecting shaft being sunk at Aurora, encouraging prospects are being obtained; while the Mammoth mine, in the Lake district, though yet comparatively young, is making large shipments of bullion.

Looking nearer home, there is observable much activity in our drift and hydraulic mines, more especially in Trinity, Sierra and Nevada counties. Along and near the mother lode of California, quartz mining is undergoing a marked revival—this industry being particularly lively in Mariposa, Tuolumne and Amador counties—where many of the older mines show great improvement, and new ore-finds of importance are being made. From that section of the great *Veta Madre* reaching from Jacksonville to Plymouth, including the Keystone, the Oneida, the Amador, Potosi, Phœnix and other historic properties, the most encouraging reports come to hand.

The Fourteenth Industrial exhibition of the Mechanics' fair opened in this city on the 5th inst., under auspices promising a creditable and successful display of our industrial, inventive and art productions.

A Generation of Active Mining.

It is 30 years the present summer since the gold seeking population began to arrive freely in California. The Marshall-Wimmer discovery occurred 16 months before; but for a year or more following that event the only accessions made to the population previously in the country came from Oregon, the Sandwich Islands, the sea-board towns of Central and South America, and from northwestern Mexico. On the 28th day of February '49, the steamship *California* entered the harbor of San Francisco, bringing the first lot of immigrants that reached here from the Atlantic side of the continent, no sailing vessels having as yet come out around Cape Horn, nor had any immigrants arrived across the plains. Along in the spring a few sailing vessels from Eastern ports began to put in an appearance at San Francisco, these arrivals increasing rapidly as the summer advanced. As the most of their passengers made their way at once to the diggings, the earlier settled camps began then to fill up rapidly, and soon over-flowed with population.

In the month of July the advance of the overland immigration began to arrive in the mines, quite a large number of these hardy pioneers having reached Hangtown, Coloma and other camps near the terminus of the main route, by the end of August. Meantime, the arrivals by sea and overland from Oregon and Mexico had rapidly increased, and, pouring into the mines, the new industrial era with its tumult and bustle, its excitements and its excesses, was duly inaugurated. In all that was least commendable and most characteristic that era has ended. It brought with it much of evil and much of good, the latter having been perhaps a little under estimated.

The period of active mining in California having been so rounded into a full generation, its history invites retrospection, there being much in it with which the on-coming age is not very familiar. Upon the news of the discovery of gold spreading abroad, there at once ensued such an emigration movement as the world never before saw, and as it will probably never see again. This movement extended to all the people in Christendom, and to some outside. All came; the Kanake, the Fiji and the Mongolian—the Mahomedan, the Pagan and the Christian. It was a new crusade, the masses being now impelled by a lust for gold, and not as aforetime by a spirit of chivalry or a pious desire to wrest the Holy Sepulcher from the hand of the unbeliever.

And so a stream of immigration sets toward this coast from all lands, the adventurers coming by every available means of conveyance; not a few who had essayed to make in wagons the journey overland being compelled to finish it on foot. Many perished on the way; some by disease, some overcome by exposure and toil, and some by the merciless hand of the savage. But these were so comparatively few that they were not missed, save perhaps in the hearts and the homes that their loss may have made desolate. Their goal of promise reached, the eager thousands rushed to the mines, and swarming through the gulches of the foothills awakened there for the first time the roar of a great industry.

And, then for seven or eight years the work of gold seeking and gold gathering went on actively and prosperously, some meeting with a great, some with a moderate, and some with but an indifferent success. The majority of the fortunate ones taking their easily acquired gains, left and came not back again. Some of the peculiarly unfortunate, disheartened and homesick, left also and never more, or but rarely, revisited California. Those that remained and made permanent homes here, consisted mainly of such as had earned enough to encourage them to hold on, and yet not enough to satisfy their desires and induce them to return to their old homes. Hence happens it that of the Argonauts who have staid with us the most have been those who prospered but moderately at first, and so were here detained till they got well weaned from their old homes and partially reconciled to the new. Staying on, these pioneers, to adopt the foreign view of their case, became at last so demoralized that they lost all zest for civilization, and may now be considered hopelessly attached to California.

At the end of these seven or eight years, the more superficial places having been pretty well dug out, gold mining began to wane, and many of the miners leaving, the interior towns went to decay; trade diminished and all other branches of business suffered a corresponding depression. As before stated, but few of the Argonauts proper came here to stay. Their sole purpose was to gather all the gold they could within a limited space of time and leave. If they staid longer than the period proposed it was, as a general thing, because they could not help it. Hence they took little interest at first in the advancement of the country socially or materially. Most of the improvements undertaken were made in a rude and hasty manner. And, although the mines were opened and worked with a determination and energy never surpassed, it was an abnormal energy, alike unnatural and unhealthy. With the subsidence of mining, therefore, improvements halted, and everything tended to relapse into its primeval condition; hullion production having shrunken the while to a third of its once large proportions.

For the next 10 or 12 years gold mining made but little progress in this State, the Frazier river, the Washoe, and other diversions of population having occurred meantime. At the end of this period the business here began to revive, and has since been improving, latterly at a very lively rate; the hydraulic gravel, the deep-lying drift deposits, and the auriferous quartz veins constituting the sites of this greater activity. In these several departments our resources are likely to prove extensive and permanent, yielding large and steady profits for a long time to come. Our stores of mineral wealth surpass, in fact, the most sanguine hopes of the early gold-seekers, though more labor and skill is now required to make them practically available.

To mining in the past, or rather to the men who carried it on, we of to-day owe a great deal. They were guilty of some excesses and fell into some errors, but these were due in good part to their surroundings, and the inherent difficulties of the business, which contained much that could be found out only by costly experiments and crucial trials. During these days of learning and testing they made sacrifices for which they will never be paid. But no generation works for itself alone, nor can any great industry be advanced to a high perfection without losses and failures. They who come after these pioneers will profit largely by their unrewarded labors—profit almost as much by their mistakes as by their improvements; they will leave to their successors a noble heritage in their experience alone.

Collecting Sulphurets in Seam Diggings.

From W. H. Howland, a practical miner of long experience, we obtain the following information in regard to the business of collecting the auriferous sulphurets from the hydraulic tailings and other containing matter, now beginning to be prosecuted by new methods and on quite an extended scale. Mr. Howland, who is an inventor as well as miner, conceived the idea not long since of passing that class of these tailings that have accumulated in the seam diggings through an ordinary rock-breaker, reducing them to about the size of peas or smaller, and thereby releasing the sulphurets, which they carry in great abundance. What are known as seam diggings consist of very thin veins of partially decomposed gold-bearing quartz, running, generally in great numbers, through the slate or other formation, the principal site of these deposits being the northerly parts of El Dorado county. These small veins having in times past been quite largely worked, considerable quantities of tailings have gathered at points where this class of operations was carried on. These veins were washed down by the hydraulic method, being broken up with picks or shattered with powder when too hard to be torn to pieces with the force of water, as always happened when followed much below the surface. These tailings are composed of fragments of quartz, slate, porphyry and gravel mixed with a little mud and sand. This mass of stuff, being shoveled or run into the sluice, is carried down and discharged into the rock-breaker placed at its lower end, and, passing through, is by it crushed to the fineness above mentioned. After passing through the rock-breaker the whole mass is run through another string of sluices provided with suitable appliances for concentrating the sulphurets and saving the free gold, quicksilver and amalgam, which these tailings carry in greater or less quantity.

The locality selected by Mr. Howland for his first experiment with this waste, and as heretofore supposed worthless material, is what was formerly known as the French mine, situated at Greenwood, an old camp on the Georgetown divide, and at a point about half way between the South and the Middle Fork of the American river. This place was chosen, not that the tailings were here richer than elsewhere, but because there were enough of them and the facilities for conducting the proposed experiment were good.

As the result of a first trial Mr. Howland finds these sulphurets to be more abundant and of better quality than was expected. The tailings also carry more free gold, quicksilver and amalgam than was at first counted upon. One lot of sulphurets brought to this city was found to assay at the rate of $1,300 per ton, another lot, more carefully concentrated, having assayed as much as $5,308 per ton. These concentrations are being treated at the Deetkin works by the chlorination process, under a guarantee to return 90% of their assay value, the price charged for working them being $35 per ton. Mr. Howland has invented and has now in use a patent riffle especially suited for rewashing this class of tailings, the sulphurets being concentrated and all their other valuable contents saved by it with great closeness. This ingenious and useful contrivance will be more fully described in our next issue.

On looking around our informant observed considerable quantities of tailings on the old dump piles in the neighborhood where he is operating, and some of which are probably as good as those he has been handling. They run uneven, however, wherever the mines themselves have been rich this refuse being found of corresponding grade. There are left here, too, still in place, many of these thin seams of quartz that appear to be full of sulphurets, and most likely contain also some free gold. They invite attention as presenting fair chances for profitable mining on a small scale.

Colorado Exaggerations.

There is no question that great wealth exists in the ground in Colorado, but the ease with which the precious minerals are reduced, coupled with the money that has been made on small investments, has blinded the eyes, and brought about fabulous statements, which demonstrate that human nature is the same all the world over. We are, in fact, children of greater growth, and our imaginations continually mislead us, particularly when glittering gold and silver is the object in the mind's eye. The Leadville fever which seized upon the mining communities of Colorado, and the heretofore cool way of talking about millions, or hundreds of thousands of dollars, has been enough to turn the brain of every man who has not gone there fully determined to preserve his equanimity.

The annual output of Leadville alone, has been estimated at one hundred millions of dollars, a few tens of millions more or less, with millions in sight is of no consequence.

These reports of the carbonate belt are freely circulated, and accredited as true, yet they are not based upon accurate information. The managers of the largest mines and the superintendents of the smelting works could not have given such information, because they could not have stopped to reckon up the output of the principal mines, the product of which is only approximately known.

Nearly all the ore produced in this camp is smelted in and about Leadville. A few small mines, producing ore of exceptionally high grade, ship it to Omaha or Chicago to be separated and refined, but the amount thus disposed of, when compared with the entire output of the camp, is very small.

There are now in operation in Leadville eight smelting establishments, with 15 furnaces, producing, when run to their full capacity, 400 tons of ore per day. A liberal estimate per ton is an average of 100 ounces of silver, and if all these smelters had run to their full capacity during the last five months, they would have turned out about $6,000,000 of bullion, but so far from this probable amount being turned out, there was only about $2,000,000 of bullion.

Eight more smelting furnaces are being put in running, an aggregate of 12 furnaces, with reducing capacity of 400 tons of ore. All of these will make the smelting capacity of the whole camp for the last six months of the year, $14,400,000. That is, if the ore supply equale the demand.

There is no certainty of any such yield of ore, and it is considered by good authorities, the smelters themselves, that $8,000,000, will be about the amount of bullion to be turned out during the last six months of 1879.

There will not, in fact, be more than 10 to 12 millions of bullion from Leadville for the entire year.

These estimates are sustained not only by the statistics showing the output of the principal mines of the camp, which can be obtained with considerable accuracy, but also by the opinion of men who are best qualified to judge. Supposing Fryer hill to produce each month ore worth $400,000, Carbonate hill $300,000, and all other mines $200,000 (and these are liberal estimates), the output from the first of June to the first of December would be only $6,300,000.

A correspondent of the N. Y. *Tribune*, says: "The president of one of the largest mining companies told me that he did not think that the year's product of the camp would exceed $6,000,000; the manager of the largest smelter thought that it might possibly reach $12,000,000, and this was the largest estimate I have been able to obtain from anyone who is in position to express a very intelligent opinion."

The silver product of the whole State of Colorado last year, was about $12,000,000. There will undoubtedly be some increase this year outside of the carbonate belt, but it will not be very great—two or three million dollars will probably cover it. The only carbonate mines that are yet producing are those here at Leadville. A few mines have been opened in the Ten Mile region, about fourteen miles from here, but there are no smelting works there yet, and as the charges for freight sent here have been $20 a ton it has been impossible to ship ore to the Leadville smelters.

The same correspondent also says: "The Gunnison country, as a mining region, is as yet almost a terra incognita. Within a few weeks only has it been accessible, and last week gentlemen who returned from there reported that in crossing the range they passed through a tunnel in the snow seventy feet long. I have no doubt that rich carbonate ores have been found there, and when they are developed they may be as valuable as those about this camp. In that case wagon roads and possibly a railroad will be built into the country, smelters will be erected and silver will be produced in large quantities. But to-day the Gunnison country is producing no silver, and no matter how rich its ores may be, it will be several months before it can begin to produce. The same may be said of the North Park and of other regions where it is reported that carbonate ores have recently been found.

"In conclusion I give it as my opinion, based on the best information I have been able to obtain, that Leadville will not send to market this year more than $10,000,000 or $11,000,000 worth of silver, and that the product of the State of Colorado will not be more than $25,000,000."

Hydraulic Tailings.

Locality, Quantity and Plans for Utilizing Them.

If under our present system of hydraulic washing we are rapidly exhausting our placer mines, so are we at the same time to some extent recreating them. If the auriferous gravel banks are fast disappearing before the powerful streams played upon them, much of the disintegrated mass, after being washed and deprived of a portion of the gold it contained, finds lodgment along the beds of the outletting rivers and gulches, creating there a species of mines of secondary formation. To this residuum from the gold-bearing earth once washed various terms have been applied, those most in use being tailings, debris, slums and slickens, the latter a name as outlandish as it is unmeaning and senseless. While these sedimentary deposits are of immense extent, filling the outletting channels mentioned to a great depth for many miles, only a small portion thereof exists under such circumstances as render their profitable rebandling possible. There are millions and even hundreds of millions of cubic yards of this stuff with which nothing can in this manner be done to advantage. Only in a few localities, in fact, are the conditions such as would render a rewashing of these tailings remunerative, or with our present appliances even practicable on anything like an extensive scale. These localities, omitting deposits of lesser magnitude and beginning at the north, consist of the Slate Creek basin in Sierra county, the upper portion of Bear river and its tributaries, Indian canyon and Shirt-tail canyon, the latter two situated on the Forest Hill divide in Placer county. With the vastly greater quantity of these tailings lodged along Feather river, in the bed of the main Yuba and along the lower Bear river, nothing in the present condition of this branch of mining can be done, there being nowhere outlet with sufficient fall for running them off. The day may come when, through the use of powerful dredgers or other style of elevators, yet to be invented, much of this material can be made available for mining purposes. A great deal of it will, however, be found too poor to be thus utilized, since the farther it has been carried down stream the less gold it contains. The broad expanse of this debris that rests for 25 miles along the Yuba and for twice that distance along Bear river, and an aggregate of 100 miles along Feather river and other streams that traverse the central mining counties, will probably be left undisturbed by the irrepressible gold seeker, to accumulate until it shall have spread out into broad alluvial bottoms suitable for the use of the horticulturist and farmer, who will some day come to occupy and improve them.

Localities of Principal Deposits—Slate Creek Basin.

While there is a great deal of hydraulic mining being carried on in Trinity, Siskiyou, and other of the more northerly counties of the State, we find no very extensive deposits of this debris further north than Slate creek, Sierra county. At points beyond, most of the hydraulic mines empty their tailings directly into the Trinity, Klamath or other large, swift-running streams, which, at the high stages of water that occur every spring, sweep them away. In the counties farther south the most of these mines discharge into gulches and ravines where much of this stuff remains, there not being sufficient water here to carry it on into the larger streams.

The quantity of mining debris that has settled and been left in the bed of Slate creek is large, the main body extending along it with an average width of 200 and a depth of 50 feet, for a distance of twenty miles or more. The material here is rich, having come in from camps noted for their large production of gold, and afterwards undergone constant concentration through the agency of the floods that annually occur along these mountain streams. On each side of this creek runs a rich gravel range or dead-river, which, for more than a quarter of a century, has been the site of many exceedingly productive drift and hydraulic mining operations, the whole tributary to this stream. During all this time Slate creek has been the receptacle for these valuable tailings, which would have been carried off into the North Yuba, into which this creek empties, but for the rocky barrier across the latter at a point near Rabbit creek. To this obstruction mainly their retention has been due. With its removal, or a sufficient passage made through it, this material could be run off and be subjected to another washing, and thus made to surrender the large amount of gold, sulphurets, quicksilver and amalgam it is known to contain. Fortunately the creek, immediately below this impediment, makes a rapid fall, affording ample escape for the debris above were it once moved through the cutting away of this rocky barrier, a work that could be accomplished at a comparatively small cost.

Of the bed of State creek the Alturas Gold mining company own and are in possession of three and one-quarter miles. As their claim includes the falls alluded to, they control the only point of outlet for both the gravel channels mentioned and the entire basin above. Already this company, availing themselves through means of a tunnel of some slight fall at Port Wine bridge, have attempted a rehandling of the tailings on their ground, but were soon forced to suspend operations, the descent below their sluices being insufficient to keep them free. In order to get the necessary grade and prosecute washing without further interruption, they now purpose making an open cut through the reef near the lower end of their claim; a work that will require but a few months and a comparatively moderate outlay of money for its completion. With a view to expediting the business, this company, which is made up of men of limited means, would be glad to exchange a part interest in the property for a fair cash equivalent. As the enterprise cannot fail to prove profitable, their offer ought to meet with ready acceptance at the hands of those having money to spare. In the entire range of our mining industries it would be impossible to find a better opportunity for the safe and profitable investment of money, since in no other have we so much absolutely certain data to go on before hand. Here cost and profit can be estimated in advance with much closeness. The amount of the material to be handled can be measured and its value, cost of treatment and probable returns calculated at the outset with approximate exactness. Such a thing as financial failure or even serious disappointment could hardly occur in an undertaking of this kind without gross, and we may say, intentional mismanagement.

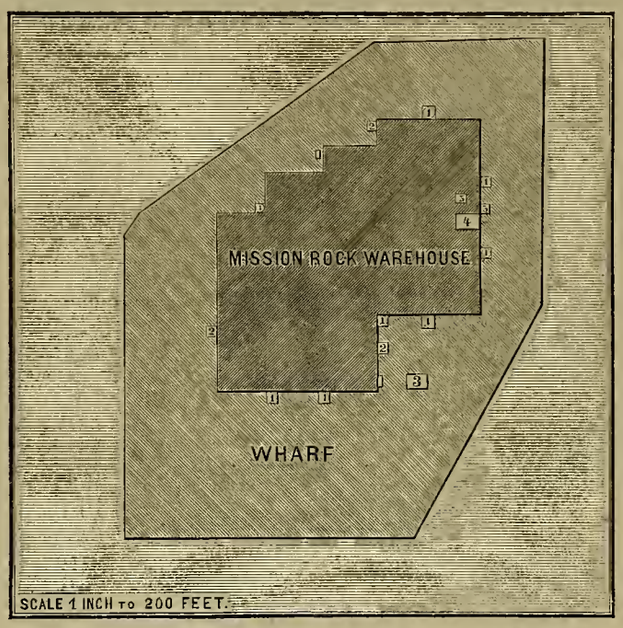
The Alturas company have completed all necessary surveys, drafted maps and diagrams illustrative of the ground, planned the work and estimated its cost, and, in short, perfected all preliminary labor, being now ready to commence actual operations, which they are anxious should be pushed diligently and with the largest means they can command during the coming dry season. To explain in detail their proposed plans of operating would require more space than can here be spared. Suffice to say these plans have been matured by skillful engineers, aided by the experience of practical miners, and will no doubt fully answer the purposes intended.

Bear River and its Tributaries.

Along Bear river and its upper confluents is to be found the greatest extent of hydraulic debris met with anywhere in the State, the material lodged along these various streams covering a linear stretch of more than a hundred miles. Fifty miles of this stuff, comprising all that lying along the lower section of the main river, will be likely to escape invasion by the gold hunter, there being no way whereby it can be again washed without being first raised through mechanical means, a process which it is not rich enough to justify. For moving the debris lying further up, including that in the main river as well as its branches, a tunnel will have to be run through the ridge that separates Bear river from the north fork of the American. Two companies have been formed for constructing each an outlet of this kind, the one designated the Bear River Tunnel, Fluming and Mining Co., and the other the Bear River Tunnel Co. The former, organized some five or six years ago, has since secured by location or purchase large sections of these tailings, some lying along the main stream and some along Greenhorn canyon, Steep Hollow and other of its branches. This company has procured to be made by some of our most competent and trustworthy mining engineers thorough examinations of all parts of their property, the results of which have been embodied in elaborate reports abounding with carefully prepared and well arranged data. Accompanying these reports are elegant maps drafted on a large scale and showing surveys made, with diagrams exhibiting longitudinal and cross sections, elevations, grade, etc., of the sluices, tunnel, river bed, tailing deposits and other features of the property and projected improvements, this company having expended some $20,000 on these preliminary labors. Their proposed tunnel, which will be two miles in length, starting on Bear river at a point about one mile above Colfax, will penetrate the ridge and open on the North Fork of the American river several hundred feet above its bend. Through this tunnel all the tailings in the various channels above the point where it starts in could be run off and emptied into the North Fork, which lies about 1,000 feet lower than Bear river. The great objection to this project is its cost, estimated at something over half a million dollars. Still, even under such an expenditure, the investment would no doubt prove a good one, as the material to be handled here is of excellent grade and vast in amount, the supply being in fact so great that with the contributions made by the hydraulic mines above it can never run short. As the tunnel projected by the other company would be less than one mile in length, the cost preliminary to getting under way would be greatly less with them than with their neighbors below. They would not, however, have so large a stock of material to draw on, though no doubt enough for all practical purposes. One or both of these schemes will probably soon be carried into effect, as these companies are now making strenuous efforts to that end.

Indian and Shirt-tail Canyons.

The quantity of tailings lodged in these canyons as compared with that in Bear river is inconsiderable, still there is a sufficiency of them and, what is quite as important, they are of superior quality. Estimating the amount in a rough way, it may be said that each of these receptacles contains a body of tailings 100 feet wide, 50 feet deep and some six or eight miles in length. To move them a rocky obstruction similar to that in Slate creek will have to be cut through, the fall below this point being in each case ample to prevent their again making lodgment before reaching the North Fork of the American river, into which these canyons debouch. The owners of Indian canyon are now engaged making the necessary opening for running off its contents, and are reported nearly ready for active operations. The owners of the other deposit are also said to be moving with a view to utilizing the same, and as they are possessed of ample means, the work, if once entered upon, will be likely to meet with early consummation.



GROUND PLAN OF MISSION ROCK GRAIN WAREHOUSE.

METEOROLOGICAL SUMMARY FOR JULY.—The report of the United States Signal Service officer, of San Francisco, for the month of July, is summarized as follows: The mean hight of barometer for the month was 29.934; mean temperature 58; mean humidity, 78.2; prevailing winds, west; highest barometer, 30.093; lowest, 29.30; highest temperature, 76°; lowest, 51°; monthly range, 15°; greatest velocity of wind, 30 miles per hour; total number of miles traveled by wind, 9,149; total rainfall, .01 inches. Rainfall in July during former years: 1872, .01 inches; 1873, .01 inches; 1874, .00 inches; 1875, .00 inches; 1876, .01 inches; 1877, .02 inches; 1878, .01 inches.

OF a grand total of 94,842 men in the British army, 62,860 belong to the Church of England, 20,872 are Roman Catholics, 7,125 Presbyterians and 3,985 of other denominations.

THE coinage of standard silver dollars will this month fall $500,000 or $700,000 short of the minimum amount fixed by law.

THE Cornish mines have been worked for over 1,000 years, and are entirely exhausted.

A Mammoth Grain Depot.

In San Francisco, from which point our bulk of the grain is shipped, huge warehouses are placed at available points on the city front, convenient to the shipping, and in positions where grain may be landed from barges without too much handling. The most extensive and complete enterprise of this character is the warehouse and grain depot, owned by the California Dry Dock Company, and situated on Mission rock, an island about 600 yards from the city front, near the Pacific Mail Steamship Co.'s wharves.

The whole property owned by the company aggregates 14 acres, of which 8½ acres are covered by wharves, the warehouses covering over 2½ acres. At any point of the wharf there is sufficient depth of water to load and float the largest ships at extreme low water, and the warehouses are accessible to receive or ship grain from all sides. There is room at the wharves to accommodate a dozen large ships at one time. The company have a small steam ferry boat, making half-hourly trips, free, to and from the landing at foot of Second street.

We made a visit to the warehouses recently and were impressed by their great size and the extreme neatness and thoroughness of the structures and all their appointments. An engraving showing a plan view is given herewith, which will give an idea of the position of buildings, etc., to those who have not seen it. At convenient points encircling the warehouses are placed tanks, numbered 1 in the engraving, which are kept filled with water for the extinguishment of fire. Rows of fire buckets are placed about in different directions. The engine houses (marked 2) are intended for sheltering the hoisting engines when not in use, these engines being used for loading or discharging cargoes. The office of the Superintendent is marked 3. The grader is marked 4, and engine and boiler rooms for grader 5.

This grader, as it is called, is the only appliance of the kind on the coast, and was but recently introduced here. This new and improved machinery, for cleaning and grading wheat for export, has a capacity of 50 tons per hour.

It is well known that the San Francisco Produce Exchange have a standard of Nos. 1, 2 and 3, by which grain is bought and sold, according to quality. This grader is intended for producing either of these grades, according to the desire of the owner. For instance, a buyer purchases a number of lots of wheat, some good and some poor, some dirty and some clean. He may have seven or eight varieties. From his samples he makes a grade which suits him, and then directs the Superintendent of the warehouse to grade the wheat in accordance with the samples sent. That is, take two sacks of the first class, three of second, eight or nine of the third, and so on. The proportionate quantity of each lot is put into the grader. This machine takes the grain, mixes it thoroughly, takes out more or less dirt, chaff, straw, etc., so as to bring the batch to the required grade. If it is wanted thoroughly clean, it can be made so. If only a second or third grade is wanted, the machine is arranged to take out more or less foreign substances as desired.

The wheat is put into a hopper and elevated to the top, where it falls into a series of shaking screens where it is cleaned and mixed, and comes out below again prepared to required grade, and is then sacked for market. Buyers can in this way average their purchases so as to bring them to suitable standards. This machine is also available for cleaning wheat where it is not desired to grade it.

Grain stored in these warehouses is always accessible to market and high rates may be obtained at all times. The warehouses are light, airy, clean and free from rats. Danger of fire is very slight, the fire insurance being only 1% per annum. Grain consigned to this company by water is insured in open policy at special rates. Wheat shipped by railroad via Stockton care of the California Steam Navigation Company will be received by them at Stockton and delivered at Mission Rock Warehouse at same rate of freight as to Oakland wharf.

Season storage ending June 1st, 1880, is $1 per ton. Short rates of storage are, for first month, 30 cents per ton, or 40 cents per ton, if delivered. Each month thereafter, 20 cents per ton. The weighing in, is free, but weighing out is charged 10 cents per ton.

The company are prepared to advance money at bottom rates, with interest payable at end of loan. Freight is paid, and fire insurance and loans are effected free of commission. The premises of this company are a model of neatness, and it is really worth a visit to inspect the mammoth warehouse and grain depot of the coast. The little ferry steamer carries passengers free, and Mr. Sinclair, the Superintendent, will take pleasure in showing visitors around. The wharves are built over the old Mission rock, and the area under the warehouses is filled in so that the superstructure is solid and substantial. The officers of the company owning this property are, Oliver Eldridge, President; W. C. Gibbs, Secretary; and Chas. H. Sinclair, Superintendent. The office is 318 California street. The entire storage capacity for grain, at present, is 40,000 tons, which can be easily increased.

No appointment for the English Mission is expected to be made until Minister Welsh returns home.

Business Directory.

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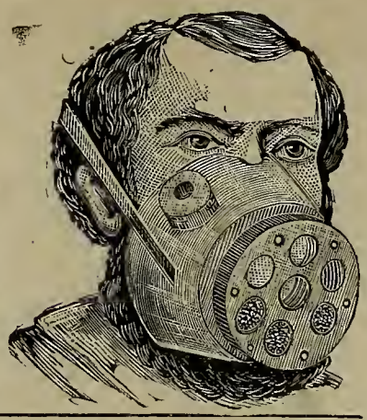

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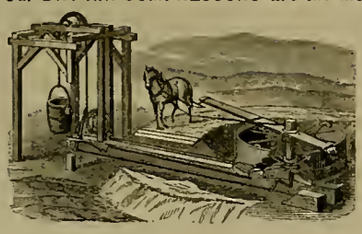

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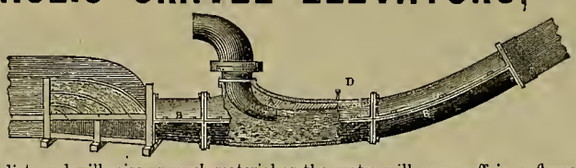

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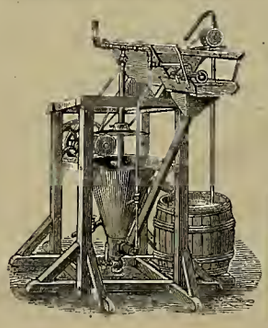

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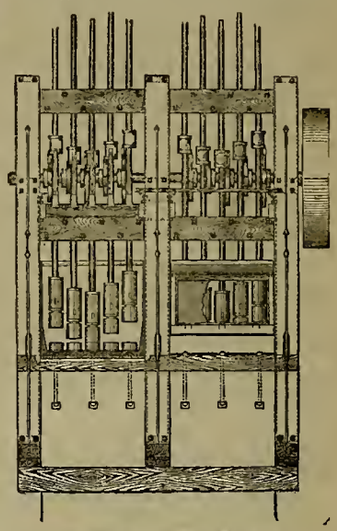

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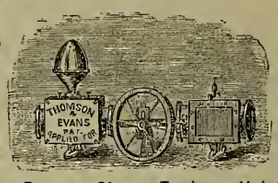

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[CONTINUED FROM PAGE 85.]

few days ago, carrying free gold from rock down three ft. The rock assayed $3,400. The Gold Fleece, located at Picayune gulch, two miles from Animas forks, produced surface gold assaying as follows: Gold, 3,051 ounces; coin value, $161,420; silver, 5,598 ounces; coin value, $5,209 76; total, $167,289.76. From 300 pounds of second-class ore was obtained, by mill run: Gold, 10 ounces; silver, 53 ounces. From 1,381 pounds third-class ore was obtained: Gold, 5 ounces; silver, 41 ounces. The Golden King, an extension of the Golden Fleece, produces ore from pay streak 12 inches wide, assaying: Gold, 3 ounces, value, $62 01; silver, 417 ounces, value, $492.06; total, $554.07. At Mineral Point the mines are active, with good ore on most of the dumps. In the San Miguel district the Lena, at present working, shows a pay streak of high grade copper, assaying 800 ounces in silver per ton, with a trace of gold. In the Diamond tunnel the vein is over four ft wide, carrying good ore the entire width. From the Susquehanna 13 tons were sampled and promise at least 250 ounces to the ton. From the Aspen mine 100 tons of ore have been taken that will average 175 ounces in silver per ton. Rich float has been found in Hensen creek, near the Burro Cabin, indicating the existence of a valuable silver-bearing vein.

CLEAR CREEK COUNTY.—The Dunkirk has a body of ground leased and is sinking on a vein of ore from a foot to 16 inches in width. This is principally fine-grained galena, no runs of which have yet been taken, but assays range from 640 to 1,790 ounces of silver per ton. The breast of the drift, which is a short distance west of the shaft just commenced, carries a four-inch vein of ore of a similar quality. The Pelican mine has a shaft sunk 150 ft east of the tunnel to a depth of 160 ft, this being the lowest point yet reached in the mine. Sixty ft below the tunnel level is a level run 600 ft west from the shaft; and at the west end of the same, a couple of men are drifting on from six to eight inches of ore carrying ruby silver and gray copper. There is considerable ore all along the lowest level, and the shaft also carries a fine body of mineral. Ore mills as high as 300 ounces. In the Little Annie the surface outcrop is distinctly visible for a distance of 3,000 ft, and gives unmistakable evidence of a strong fissure vein. The ore taken out of the discovery shaft ranged from 200 to 700 ounces per ton, carrying sulphurets and silver glance, but consisting mainly of galena. In the O K lode the ore streak is from two to three inches in width and consists of galena and gray copper, and outside of this there is some scattered ore carrying gray copper and ruby silver. The ore of the Isothermal assays from 300 to 800 ounces, and the crevice is from 20 to 30 ft wide.

IDAHO.

ITEMS.—*Statesman*, July 31: Considerable placer mining is going on on South Boise river, Alturas county. A run of three weeks in one of them netted $300. The old fashioned hose and pipe are used. A man by the name of Smiley has struck a silver quartz lead, 16 miles above him, on the South Boise, called Smiley's district, and taken prospects to Atlanta, which Mr. Einsfeldt has assayed, making several assays that go $5,000 to the ton. Quartz is being taken out with great energy from the old leads at Rocky Bar.

A MAMMOTH LEAD.—Dr. J. L. Stephens gives the following description of the lead which he has located with C. Jacobs and Charles Himrod. The lead is not to exceed eight miles from town and a short distance to the right of the Idaho City road on this side of the summit. It crops out at the point of discovery, three ft high, and is from two to ten ft wide. He thinks the lead will average eight ft on the surface and can be traced three miles. They brought down rock and had two assays made; the lowest went $26.80 and the highest $208 to the ton in free gold. They call it the Palmer lead, and have located 3,000 ft, and 3,000 ft of extensions have already been located by other parties. Doctor Stephens says this mountain range is full of quartz, and is as good a mineral belt as there is in the Territory.

UTAH.

BINGHAM.—*Tribune*, Aug. 2: Tom Sullivan struck a vein of high-grade ore in this district, way up toward the clouds and between the Clipper and Bret Harte mines, and named it the Davenport. It produces ore which assays 118 ounces in silver, with a sprinkling of gold. Two miners on the sundown side of the Squash summit, have penetrated 600 ft in the Clipper and about half that depth in the Rob Roy and other mines. Their ore is high grade. The last lot sampled 120 ounces in silver. Two arastras worked by mule power, have recently been erected in Muddy gulch, above the Stuart mill. These, with the mill, backed up by the usual drouth, exhaust the water available in that gulch, and the company are about to bring water from Carr Fork by means of 2½-inch pipes made of galvanized iron, and laid upon the surface of the ground, from a point near the Sunset mine in the last-named gulch.

Kern County Mines.

EDITORS PRESS:—After a week's traveling in this vicinity of country, I find it in a prosperous condition. There are a great many miners at work in the gold mines here, principally placer mines. Some of them are doing remarkably well. At the French mining camp in Rag gulch they average about $6 per day to the man. There are many different camps here in which all of them are making fair wages at present, and the prospects for the future are remarkably good. There are some good ledges of gold quartz here, though none of them are being worked to any great extent. Messrs. Biggs & Garrison are at work on a quartz ledge near White River P. O. A few days ago they cleaned up their one-horse mill and got $500, which pays them very well for two weeks' work. Yet they could not get all the gold with their broken, worn-out mill. Mr. T. C. White also has a rich quartz ledge, in Grizzly gulch, which undoubtedly contains a rich treasure. I also find a great many old and experienced miners here, men who have worked mines in different countries, and they say the prospect here for gold, silver and copper is as good as it is in any mining country.

A discovery of some new placer mines was made a few days since by some gentlemen from Bakersfield. They are artesian well borers. They sunk several 8-inch holes in the valleys. Where they would get a fair prospect with the auger, they would sink a shaft. It is a much easier and quicker way of finding the bedrock than to dig to it. I saw them sink a hole 22 feet in one hour. All of the miners seem to be greatly pleased with the discovery. I am forced to believe that this country will yet show to the world its hidden treasures at no distant day. MILTON KENNEDY.

Glenville, Kern Co., Cal.

THE United States Consul at Gibraltar has been threatened with death unless $3,000 is forthcoming.

Opening Exercises of the Fourteenth Industrial Exhibition,

An extremely large audience greeted the managers of the Mechanics' fair at the Grand Opera House Tuesday afternoon, and the attention given to the programme evinced a more than ordinary interest. Upon the stage were seated some of the representative men of San Francisco. The exercises were opened by the rendition of the Grand Exhibition march. The orchestra, under Prof. Schultz, showed its powers as an artistic combination in its musical abilities displayed in this selection, which is an original composition of Prof. Schultz. Few selections are, in our opinion, superior to this home composition. The opening address was delivered by Irving M. Scott, Esq., in a very able manner, and his remarks were frequently applauded. The address was as follows:

The President's Address.

Ladies and Gentlemen:—The progress of mechanical arts is more wonderful than the magic power of Aladdin's lamp, and illumines the aphorism, "Truth is stranger than fiction." Bud and blossom precede the mellow fruit and golden grain; the ideal the reasoning; roseate youth, grave and philosophic age. The early conceptions of the forces of nature, and acquisitions of science, art and religion, are full of poetic imagery.

Principles properties and *achievements* were personified as supernatural beings.

Aeolus. Neptune, Vulcan, Minerva, Odin, Wodin and Brahma, coming to us with the must of ages, were the buds whose after fruit gave us a Christian religion with a Divine power as its center. The search for the philosopher's stone, the *alkahist* and a universal solvent, brought from crucible and closet truths upon which was founded the noble science of chemistry. The search for a universal remedy forall diseases, with witches' spells and incantations, has blossomed into a materia medica, founded upon a correct and intelligent diagnosis, as the only substantial basis for the treatment of disease. They who sought to forecast the future, and read their destinies in the stars with symbols and "mathematic sign," plowed the field from which astronomy reaps her golden grain. And they whose superstitions and fears translated the electric forces into Jupiter's fulminations, hurling the fiery bolts of heaven in divine wrath, wonder at the marvelous deeds of telegraph and telephone, and await the coming harvest, whose ripening grain is so full of promise.

The architect, sculptor and painter of antiquity, rearing and adorning triumphal arches, mausoleums, amphitheaters and temples, were the avaunt couriers of

"First, unadorned and nobly plain,
The manly Doric rose;
The Ionic then, with decent matron grace,
Her airy pillow heaved;
Luxuriant, last, the rich Corinthian,
Spread her wanton wreath."

The Romans add the Tuscan and composite, and from ancient rites bloom these five unrivalled orders in mechanic art.

They who sought perpetual motion and the impossible, mingling superstition and craft with honest effort, laid the rails for the car of mechanical progress, whose telescopic eye sweeps beyond the horizon of their time; whose metallic tongue tells the world's gossip; whose analytical nose determines and defines with perfect truth all component relations; whose mechanical ear will tell the future of the present through indestructible plates; the reach of whose arms enfolds all other. And whose achievements lead her students

"Into regions yet untrod,
And read what is still unread
In the manuscript of God."

Of the seven wonders of the world, representing the advancement of antiquity in the mechanic and elegant arts, with the exception of giving employment to vast labor at the price of individual liberty, and in furnishing classic models, only the *Pharos* was, so far as known, of practical benefit. The talent, genius and study of those remote ages, seem to have been devoted largely to the art of war; luxury, ornamenting structures for games and the worship of idols.

Prior to Archimedes little progress had been made in analytical or practical mechanics. With the screw and specific gravity came the exclamation, "Give me where to stand, and I will move the earth."

The doom of Sampson: "They put out his eyes and bound him with fetters of brass and he did grind in the prison house," indicates the use of millstones to belong to a remote age. The improvements of the Romans in hydraulics—in using water to drive stamps and for mill purposes—though limited, is described by a writer of those days: "Cease ye maidens, ye who labored in the mill; sleep now and let the birds sing to the ruddy morning, for *Ceres* has commanded the water nymphs to perform your task."

The commerce of antiquity was mostly inland. The directive power of the magnet, the key of maritime commerce, was not known in Europe until late in the twelfth century, though the Chinese claim its discovery 2,634 years before the Christian era.

The agriculture of the ancients was carried on by rude implements; plowing with a crooked stick. The Romans added the colter and mold board and iron shares. Pliny the elder states in the first century of the Christian era, in the lowlands of Gaul, large vans with projecting teeth were driven on two wheels through the standing corn, the ears of which were torn off and fell into the van. A yoke of oxen pushed it before them; this was the beginning of our modern reaper.

Pottery, porcelain and glass were in some instances carried to great perfection. Fabrics of linen and cotton date almost back to the fig-leaf. The cere cloth from Egypt comes well preserved 4,000 years old, and hemp is as old, and silk came from the Orient 2,600 years before the Christian era.

Gold, copper, bronze, and their workings, come from the earliest times. After these came the age of iron. The Huns, early Britons, Greeks and Romans used iron largely for armor and arms. The residuum of the early Roman iron furnaces in the Dean forests, England, supplied 20 furnaces one hundred years. The working of iron was considered of the first importance in the arts of civilization. Accepting the classification of Lucretius, that man's earliest arms were fingers, teeth and nails, and stones and fragments from the branching woods; then copper next, and later the tyrant Iron.

As representing three periods in the progress of a nation's development from barbarism to civilization, it will be seen the Romans had made the greatest advancement. The fall of the Roman Empire stranded the Admiral of the fleet of ages. Her vast treasures were scattered, war drank the blood of millions. One by one the lights of science, art, literature and civilization flickered and went out. Darkness settled over the world. Centuries went and came till the genius of Copernicus, Galileo, the Bernouillis, Kepler, Liebnitz and Newton, princes of philosophers, lifted the darkness and let in the light of the brightest day since the dawn of creation. The evolving the Copernican system of astronomy. The discovery of the law of falling bodies. The laws enunciated by Kepler; the laws of attraction; the principles of fluxions on the differential and integral calculus; the inventions of the telescope and time-keeper.

Problems in philosophy and mechanics, terrestrial and celestial, were resolved by the touch of a wand more potent than that of the magician. The foundations of the grandest and loftiest temple of know edge were laid broad and deep in *eternal truth*. Chemistry rose from the mystic arts of the conjurors, to the dignity of science; the affinities of matter and the combining proportions of its atoms were established upon a firm basis; matter was shown subject to a change of form, but not to destructibility.

Geology rose from the hypothetical to the real, and students read from fossils, strata and formations, the history of the earth back millions of years.

The discoveries and inventions of the last three hundred years equal, if they do not exceed, those in all preceding times. Rumford discovered that "heat is a mode of motion." Chemical analysis showed matter to be indestructible. More recent investigations prove force indestructible. The heat and light of the sun stored in the coal fields ages ago is now developed in the motion of the steam engine and the electric light. The heat of the sun lifts the waters to the clouds; they fall in beneficent rain, supplying the wants of life. Every blow of the hammer, all animal movements, the heartfelt sigh, the trickling tear, the merry laugh, thought of the brain—all have their mechanical equivalent in the sun's heat.

In an enlarged view, the study and application of force in its myriad forms, taken in connection with inert matter, constitutes the province of the mechanic. His field of research is upon the land and upon the sea—in the earth and air, and in the starry heavens. Conscious that *reason* is heaven's richest endowment, he fearlessly follows her lead, though it be where "*angels bashful look.*"

Printing and printing presses—the application of steam to the engine, steam navigation, reaping machines, sewing machines, locomotives and railroads—cotton and woolen goods, and their mechanical appliances, with which a child of to-day directs the motion of six thousand spindles, and makes from a pound of cotton a thread *one thousand* miles long, and does over six thousand times the product of the best spinster of a hundred years ago. Mark the progress of mechanical art. The telegraph, telephone, electric light, photograph and spectroscope are a few culled from the vast treasures of the world. By whose peculiar functions intelligence is communicated with the fleetness of the lightning's wings from person to person, from city to city, across continents, and through the seas. Speech in the exact intonations of the speaker's voice addresses the ear miles away, or reposes for the time to discover the present to posterity. The electric light reappears as pure as when cycles ago it darted from its solar fireside. The features and expression of animate and inanimate nature, terrestrial or celestial, are delineated at sight. And the composition of the sun, stars, comets, nebula, determined with the precision of chemical analysis.

Contemplating these achievements, the mind unhidden exclaims, Science! Oh, beautiful science! How delicately frail thy youth! How often was thou prostrated in the dust by the monster ignorance! But as often rose and grew in goodly proportions till now, the Nadir is thy footstool! The Zenith thy diadem and systems of rolling worlds thy toys! Atoms, myriads of suns and systems are in thy ken! And star dust in thy grasp: science, mechanics, civilization, and their economies fellow-citizens you inherit.

And in the conflict of races their fate is in your hands, you are face to face with the problem of life on a more economic basis than Californians have hitherto submitted to, and this re-adjustment shows much chaffing and discontent, which will test the principles of our pioneers. And prepare the coming generation for their task of building homes, whose social roots must be sent straight down into the soil of truth and virtue, and manly self-reliance.

We must prove our faith in ourselves by being our own customers and keep the wheels of industry moving and the hands of labor employed at home. These annual exhibits gather under one roof the aggregate product of our industries, and to the observing student mark our advancement or our decline. Beginning with the rude and fragile canoe, causing but a ripple upon the water, there have arisen, as by enchantment, vast fleets, ploughing the ocean's wave in every clime, and mighty navies, whose thunders shake the foundations of rock-built cities.

These, as also the rude cabin, the cottage and palace, the halls of learning, the domed capitol of nations, the temples of justice and of worship, with their lofty and symmetrical spires, the hamlet and vast cities, the useful and ornamental, the grand and the beautiful, are all the works of the mechanic. Not an improvement in agriculture and commerce and domestic affairs, tools in manufacturing, instruments employed in any way of the learned professions thread spun, fabric wove, article made, garment or jewel worn, nor letter printed, but that it is of the works of the mechanic; the pen and sword—the plow and gun; the implements of peace and the implements of war are alike the works of his hands.

By his efforts this is made a *live* world; the mind, individually and collectively, is refined and elevated. Comforts are secured, and civilization rendered a fact.

The pages of history contain the declarations—I am a physician! I am a lawyer! I am a divine! Made suggestive of the old Roman's pride, in using the password of the world, *I am a Roman citizen!* But now and henceforth let the prouder password be, *I am a mechanic.*

The poem of Miss Julia Clinton Jones, "Mechanic Art," was delivered by Mr. T. W. Keene in an unapproachable manner. The poem itself is a gem, and Mr. Keene proved himself equal to the occasion.

The "Dream of Love," rendered with cornet solo by Prof. Henery Mehden and orchestra, was so beautiful that we were sorry when the finale was rendered.

Dr. Thomas Guard, delivered the oration of the 14th exhibition in an able and interesting manner, riveting the attention of the audience by his wit and by his solemn eloquence, and we are sorry our space will not admit his remarks in full.

The closing piece by the orchestra, "Overture" by Hermann, effectively concluded the opening exercises, and declared the 14th Mechanics' fair open to the public.

Paying for Government Timber.

J. A. Williamson, Commissioner of Public Lands, has issued the following circular, showing how those who have cut Government timber may escape prosecution. The instructions are addressed to registers and receivers in the land offices:

The fact having been brought to the notice of the Department that many parties who have cut railroad ties, cordwood and logs upon the public wooded domain, are desirous of relieving themselves of liability to prosecution for violating the statutes relating to illegal cutting of timber, by paying for the same, you are hereby authorized and instructed to make settlement with all persons who have trespassed upon the public timber lands in your district, prior to the 17th of June, 1879, by cutting railroad ties, cordwood, or logs therefrom, and who propose to settle therefor, upon the following terms, viz.:

1st. For all railroad ties, two and one-half cents per tie. 2d. For cordwood, 50 cents per cord. 3d. For logs, one dollar per 1,000 feet (board measure).

As a condition precedent to such settlement, you will require each and every person seeking the same, to submit to you a full statement, under oath, showing the time and place where the trespass was committed, and the quantity of ties, wood or logs by him, or them, taken and removed from the public lands.

If a proposition is accompanied with the statement that a portion of the ties, wood or logs was taken from railroad lands, you will not allow any deduction for that reason, except it be conclusively shown that all the trespasses for which settlement is desired were within railroad limits. You will also make special reports of each settlement thus made to this office, and will also forward a consolidated monthly report of the same.

The foregoing instructions do not apply to cases where criminal or civil suits have been instituted against the parties in interest. In such cases you will receive the propositions to settle, when conforming to the requirements above set forth, and transmit them to the U. S. District Attorney having charge of the suits, accompanying the reference with a copy of these

instructions, and a report of facts as you may find them; at the same time forwarding to this office copies of all papers sent to the U. S. Attorney, and in your monthly consolidated statement of cases noting those so referred. Nor are they to be construed as conflicting with the provisions of the act authorizing the citizens of Colorado, Nevada and the Territories to fell and remove timber on the public domain for mining and domestic purposes, approved June 3 1, 1878.

In cases involving a conflict of identity as to the proper party or parties to pay the stumpage rates, and in all cases of illegal cutting of logs, ties or wood upon government lands, you will seize the same and hold the property until the stumpage rates above announced are paid.

In all cases where there are costs of watching over and caring for the property, they must be embraced in the settlement and liquidated by those seeking it.

You are further instructed to report, with as much detail as practicable, any and all trespasses upon timber lands, committed after the 17th of June, 1879, that may come to your knowledge, in order that criminal proceedings may be instituted to punish the parties guilty of such trespasses.

News in Brief.

THE ZULU war cost England £4,500,000.

TURKEY is still arming the Greek frontiers.

A SERIOUS riot is reported at Phillipopolis, Turkey.

THE late Khedive of Egypt will reside at Rhodes.

THE increase of the public debt for July was $6,086,344.

THE French colony in Egypt consists of 20,000 persons.

A CONFLAGRATION is raging at Ortakeui, on the Bosphorus.

MINNESOTA will harvest 44,000,000 bushels of wheat this season.

FRESH disturbances are reported in Silesia, on the Russian border.

THE failure of the Consolidated Bank at Montreal is announced.

THE Colorado beetle has made its appearance in county Cork, Ireland.

BULLION in the Bank of England increased £273,000 the past week.

BASHI-BAZOUKS are pillaging and assassinating on Bulgarian territory.

IN France, slates used in roofing are bedded in plaster on the boarding.

OHIO is about to be flooded with campaign documents from Washington.

LORILLARD'S "Papoose" came in sixth in the race at Goodwood, Eng., lately.

"LUCY" won the fifth heat in the postponed pacing race at Cleveland in 2:16.

THE Tuileries ruins are to be demolished and the site transformed into a garden.

DURING July the total coinage at the United States mints was $4,681,610.

THE Stadacoma Bank, at Quebec, will go into liquidation and wind up its affairs.

THE crops in Hungary and Galicia have been damaged by heat, followed by rain.

THE rush from New York for summer resorts is greater than at any time since 1876.

THE free postal delivery system will be established at Portland, Or., October 1st.

THE army of the Zulus is broken up, the nation dispersed and the King a fugitive.

THE condition of the currency at Constantinople is becoming more deplorable daily.

THE Custer battle field on the Little Big Horn has been made a national cemetery.

THE Government expects to prorogue the British Parliament on the 16th of August.

THE annual session of the National Educational Association has begun at Philadelphia.

A DISEASE resembling cholera is ravaging Center Point and Walker, Linn county, Iowa.

ANOTHER expedition in search of the North Pole will leave England in the spring of 1880.

THE weather is excessively warm at St. Louis, and several cases of sunstroke have occurred.

LORD DERBY'S recent award as umpire affects 57,000 persons in the Durham, Eng., collieries.

THE corner-stone of the monument to Gen. Anthony Wayne was laid at Erie, Pa. August 4th.

BULLION to the amount of £500,000 was paid into the Bank of England on balance August 4th.

A SKIRMISH between United States troops and Indians occurred Saturday at Salt Lake, Texas.

HALF a score of obnoxious publications have been suppressed within the last few days at Berlin.

THE old woman who threw a stone at the King of Spain has been sent to an insane asylum.

AT Liverpool wheat is quoted at 8s 6d@9s 8d for average California white, and 9s 6d@9s 10d for club.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Hillside, July 31st, $4,000; Alexander, August 1st, $11,004.61; Con. Virginia, July 28th, $47,373.07; Indian Queen, July 28th, $4,579.16; Northern Belle, July 30th, $8,473.44; Hillside, August 4th, $4,200; Ophir, July 29th, $25,464.88; Belle Isle, August 4th, $29,000; Independence, August 4th, $6,000; Bodie Con., July 29th, $18,752.42; Chisty, August 2d, $7,838; Northern Belle, August 2d, $6,682.18; Martin White, August 3d, $7,947.20.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS TO DEWEY & CO.'S MINING AND SCIENTIFIC PRESS PATENT AGENCY.]

FOR THE WEEK ENDING JULY 29TH, 1879.

217,978—VEHICLE SPRINGS—E. T. Barlow, S. F.
217,985—CHIMNEY—J. Browell, S. F.
217,027—PIPE JOINT—J. P. Culver, S. F., and T. H. Walsh, N. Y.
218,017—CLUTCH-COUPLING—S. Gullickson, S. F.
218,018—BOLT AND ROD GRIPPER—S. Gullickson, S. F.
218,022—ELEVATOR—E. D. Haven, Portland, Ogn.
218,053—VEHICLE AXLE SKEIN—P. Neder, Salt Lake City, Utah.
218,054—LOCK—F. Newhoff, S. F.
218,065—ROTARY MEASURE—A. Ritchie, S. F.
218,071—WEED TURNER—J. Sherrill, Harrisburg, Ogn.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

REDDING, July 12th, 1879.

MESSRS. DEWEY & CO.— *Gentlemen:*— Have received my letters patent for the bar roller to-day. I am very much obliged to you for your prompt service, and will recommend you to all who may want your assistance.

I remain yours, etc., OEO. MEDING.

HOW TO STOP THIS PAPER.—It is not a herculean task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

EXTRA COPIES can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

PRINTER'S PROOF PRESS, complete and in good working order, for sale at this office, at the low price of $30. Call and see it.

EXPERIMENTAL MACHINERY, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. See ad. F. W. FULLER, 415 Market St., second floor, S. F.

Chew JACKSON'S BEST Sweet Navy Tobacco

GENERAL MERCHANDISE.

[WHOLESALE.]

WEDNESDAY M., August 5, 1879.

CANDLES.	
Crystal Wax	17 @—
Eagle	12 @—
Patent Sperm	30@—
CANNED GOODS.	
Assorted Pie Fruits, 2½ lb cans	2 25 @ —
Table do	3 50 @ —
Jams and Jellies	3 75 @ —
Pickles, hf gal	3 25 @ —
Sardines, qr box	1 57½@1 90
Hf Boxes	2 50 @2 75
Merry, Fault & Co.'s. Preserved Beef, 2 lb. doz	3 75 @4 00
do Beef, 4 lb. doz	5 50 @ —
Preserved Mutton, 2 lb. doz	3 75 @ —
Beef Tongue	5 50 @ —
Preserved Ham, 2 lb. doz	6 50 @ —
Deviled Ham, 1 lb. doz	5 50 @ —
do Ham, ½lb doz	3 00 @ —
Boneless Pigs Feet, 3 lbs	4 50 @ —
2 lbs	3 75 @ —
Spiced Fillets, 2 lbs	4 25 @ —
Head Cheese, 3 lbs	4 25 @ —
COAL—Jobbing.	
Australian, ton	5 00 @ 5 50
Coos Bay	— @ 5 50
Bellingham Bay	— @— —
Seattle	5 50 @ 6 00
Cumberland	12 00 @15 00
Mt Diablo	4 75 @ 5 00
Lehigh	11 50 @12 50
Liverpool	5 00 @ 6 50
West Hartley	— @ 8 00
Scotch	— @ 8 00
Scranton	— @— —
Vancouver Id	6 00 @— —
Charcoal, sack	75 @— —
Coke, bush	60 @— —
COFFEE.	
Sandwich Id, lb.	— @— —
Costa Rica	15 @ 16½
Guatemala	16 @ 16½
Java	25 @— 26
Manila	17 @— —
Ground, in cs	25 @— —
FISH.	
Sac'to Dry Cod	— @ 4
do in cases	5 @ 5
Eastern Cod	— 7 @— 7½
Salmon, bbls	8 00 @ 9 00
Hf bbls	5 00 @ 5 50
1 lb cans	1 10 @ 1 12½
Pkld Cod, bbls	22 00 @— —
Hf bbls	11 00 @— —
Mackerel, No. 1. Hf Bbls	9 50 @10 00
In Kits	1 85 @ 2 10
Ex Mess	3 25 @— —
Pkld Herring, bx	3 00 @ 3 50
Boston Smkd Hg	70 @— —
LIME, Etc.	
Plaster, Golden Gate Mills	3 00 @ 3 25
Land Plaster, tn	10 00 @12 50
Lime, Sta Cruz, bbl	1 25 @ 1 50
Cement, Rosendale	2 00 @ 2 25
Portland	4 00 @ 4 50
NAILS.	
Assted sizes, keg	2 70 @ 2 75

OILS.	
Pacific Olive Co's Neatsfoot, No 1	1 00 @ 90
Castor, No 1	1 35 @ —
do, No. 2	1 30 @ —
Baker's A A	1 25 @1 30
Olive, Plagniol	5 25 @5 75
Possel	4 75 @5 25
Palm, lb	9 @ —
Linseed, Raw, bbl.	78 @ —
Boiled	80 @ —
Cocoanut	55 @ —
China nut, cs	— @ 55
Sperm	1 40 @ —
Coast Whales	— @ 32½
Polar	— @ 35
Lard	— @ 70
Olophine	22 @ 22
Devoe's Brl't	17½@ 18½
Photolite	— @ —
Nonpariel	31 @ 32½
Eureka	13 @ 42½
Barrel kerosene	20 @ —
Downer Ker	35 @ —
Elaine	37½@ —
PAINTS.	
Pure White Lead	8 @ 8½
Whiting	1½@ —
Putty	4 @ 5
Chalk	1½@ —
Paris White	2½@ —
Ochre	3½@ —
Venetian Red	3½@ —
Averill Mixed Paint, gal. White & tints	2 00 @2 40
Green, Blue & Ch Yellow	3 00 @3 50
Light Red	3 00 @3 50
Metallic Roof	1 30 @1 60
RICE.	
China, Mixed, lb	4½@ 5
Hawaiian	6 @ —
SALT.	
Cal. Bay, ton	15 00 @22 50
Common	10 00 @12 00
Carmen Id	12 00 @14 00
Liverpool fine	19 00 @— —
SOAP.	
Castile, lb	8 @ 15
Common brands	4½@ 6
Fancy brands	7 @ 8
SPICES.	
Cloves, lb	— @ 45
Cassia	19 @ 20
Nutmegs	85 @ 87½
Pepper Grain	— @ 12
Pimento	19 @ 20
Mustard, Cal., ½ lb glass	— @1 25
SUGAR, ETC.	
Cal. Cube, lb	— @ 10½
Powdered	— @ 10½
Fine crushed	— @ 10½
Granulated	— @ 10
Golden O	— @ 8½
Cal. Syrup, kgs	70 @ —
Hawaiian Mol'sses	25 @ 30
TEA.	
Young Hyson, Moyune, etc	— @ 51
Country pckd Gunpowder & Imperial	— @ 42½
Hyson	30 @ 35
Fooo-Chow O	35 @ —
Japan, 1st quality	40 @ —
2d quality	20 @ 25

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & CO.]

SAN FRANCISCO, August 5, 3 P. M.

SILVER, 25.

GOLD BARS, 830@910. SILVER BARS, 6@15 ⅌ cent. discount.

EXCHANGE on New York, 20, on London bankers, 49½@49¾. Commercial, 50; Paris, five francs ⅌ dollar; Mexican dollars, 90@92½.

LONDON Consols, 97 15-16; Bonds (4½), 105¾.

QUICKSILVER in S. F., by the flask, ⅌ lb, 33½c.

METALS.

[WHOLESALE.]

WEDNESDAY M., August 6, 1879.

IRON.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2½@ 3½
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 7
Norway, according to thickness	6½@ 7
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	15 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @
TIN PLATES.—	
10x14 I O Charcoal	8½@ 9
10x14 I O Coke	7 @ 7½
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft, 7 to 10, lb, less than cask	9½@— 10
NAILS.—	
Assorted sizes	2 90@3 00

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending August 5, 1879.

HIGHEST AND LOWEST BAROMETER.

July 30	July 31	Aug. 1	Aug. 2	Aug. 3	Aug. 4	Aug. 5
29.939	29.867	29.780	29.845	29.904	29.935	29.912
29.866	29.730	29.732	29.754	29.862	20.873	20.850

MAXIMUM AND MINIMUM THERMOMETER.

64	76	79	69	65	63	63
55	54	60	60	54	54	54

MEAN DAILY HUMIDITY.

82.3	68	50.7	72.7	75.3	81.3	80.3

PREVAILING WIND.

W	W	W	W	W	SW	W

WIND—MILES TRAVELED.

303	239	164	200	343	318	270

STATE OF WEATHER.

Fair.	Clear.	Clear.	Clear.	Clear.	Cloudy	Fair.

RAINFALL IN TWENTY-FOUR HOURS.

Total rain during the season, from July 1, 1879, 0.01 in

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Gover Mining and Milling Company.—

Principal place of business, San Francisco, California. Location of works, Amador county, near Drytown, California.

Notice is hereby given that at a meeting of the Board of Trustees, held on Wednesday, the 6th day of August, 1879, an assessment (No. 39) of Fifty Cents per share was levied on the capital stock of the corporation, payable immediately, in gold coin or legal currency of the United States, to the Secretary, at the office of the company, Room 8, No. 402 Front street, San Francisco, California.

Any stock upon which said assessment shall remain unpaid on Tuesday, the 9th day of September, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 6th day of October, 1879, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Trustees. W. O. WILSON, Secretary.

Office, Room 8, No. 402 Front street, San Francisco, Ca

Numa Mining Company.—Location of Works, Humboldt County, Nevada.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 1) levied on the 13th day of June, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. of Cert.	No. Shares	Amount
Blasdel, E W, Trustee	27	500	$ 15 00
Blasdel, E W, Trustee	28	500	15 00
Blasdel, E W, Trustee	31	500	15 00
Blasdel, E W, Trustee	47	500	15 00
Blasdel, E W, Trustee	48	167	balance 5 00
Brown, George A	42	500	15 00
McKusick, H J	44	4000	120 00
Pierson, Wm M, Trustee	53	2500	balance 75 00

And in accordance with law, and an order of the Board of Trustees, made on the 13th day of June, 1879, so many shares of each parcel of said stock as may be necessary will be sold at public auction at the office of the Company, 328 Montgomery street, room 21, San Francisco, Cal., on the 11th day of August, 1879, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale. DAVID WILDER, Secretary.

Office, 328 Montgomery Street, room 21, San Francisco, California.

Annual Meeting—Office of the Rocky

Point Mining Co., San Francisco, Cal., July 22d, 1879. The Annual meeting of the stockholders of the Rocky Point Mining Company, for the election of a Board of Trustees for the ensuing year, and for the transaction of such other business as may properly come before it, will be held at their office, No. 314 Bush street, San Francisco, California, on Monday, August 18th, 1879, at two o'clock P. M. of that day. Transfer books will be closed on Monday, August 11th, 1879, at 12 o'clock M.

T. L. BIBBINS, Secretary.

Annual Meeting—Office of the Mono

& Cross Consolidated Mining Co., San Francisco, Cal., August 8th, 1879. The Annual Meeting of the Stockholders of the Mono & Cross Consolidated Mining Company, for the election of a Board of Trustees for the ensuing year, and for the transaction of such other business as may properly come before it, will be held at their office, Rooms 3 and 4, No. 309 California street, San Francisco, California, on Monday, August 25th, 1879, at two o'clock, P. M., of that day. Transfer books will be closed on Thursday, August 14th, 1879, at three o'clock, P. M.

J. M. BUFFINGTON, Secretary.

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CALIFORNIA THEATER.

BARTON & LAWLOR.....Manager.
BARTON HILL.....Acting Manager.

IMOGENE.

Bush Street, above Kearny. Open every evening. Box office open from 9 A. M. to 10 P. M. Seats may be secured six days in advance.

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THOMAS MAGUIRE.....Manager.
CHAS. H. GOODWIN.....Treasurer.
J. P. CHAPMAN.....Assistant Treasurer.

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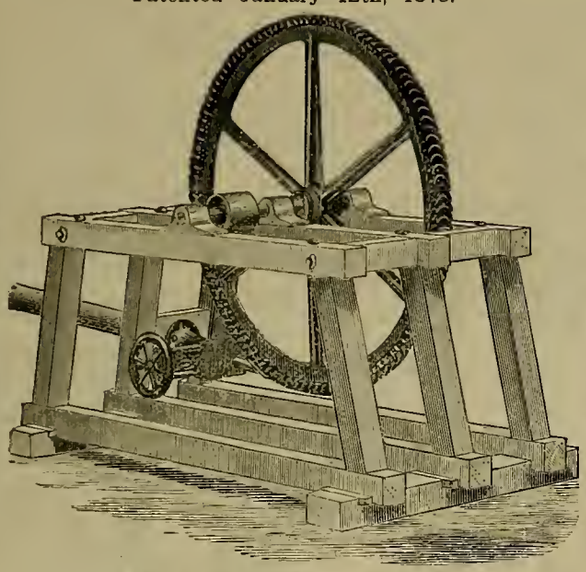

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1-Eight-foot wheel running pump at same company's mine. S. D. R. Stewart, Supt.
1-Eight-foot wheel, running Keystone Con. Mining Co.'s Mill, Amador county, Cal.; 40 stamps.
2-Four and one-half foot wheels, used in hoisting by reversible water power at same company's mine. O. C. Hewitt, Supt.
1-Four and one-half foot wheel, running Original Co.'s Mill, Amador County, Cal.; 40 stamps, one pan, one rock-breaker. J. R. Johns, Supt.
1-Four-foot wheel, running Gover Mining Co.'s new mill, Amador county, Cal.; 20 stamps.
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1-Six-foot wheel, running Tallsman Mining Co.'s Mill, Amador county, Cal.; 10 stamps.
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1-Six-foot wheel, running St. Patrick's Mill, Newcastle, Placer county, Cal.; 15 stamps. Jno. Townsend, Supt.
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1-Six-foot water wheel running 20 stamps at Juliau mine, Newcastle, Placer Co., Cal. A. H. Schnabel, Prop'r.
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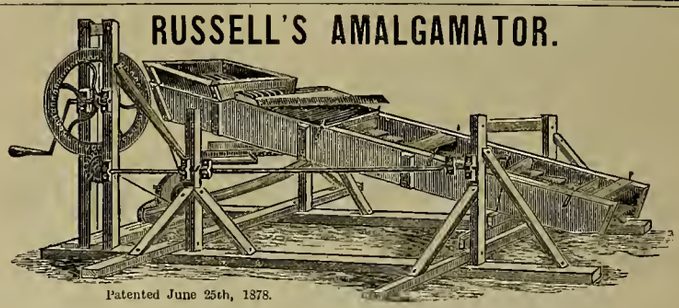

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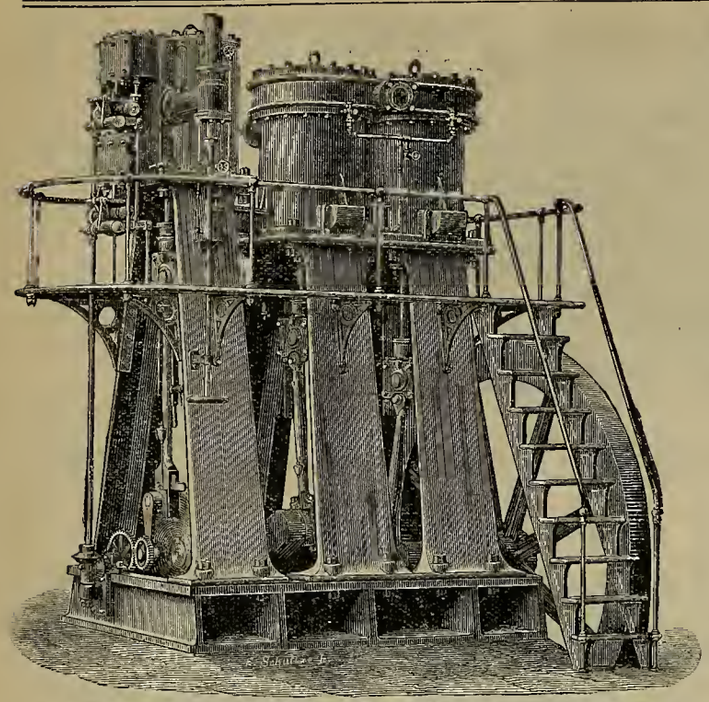

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, AUGUST 16, 1879.

VOLUME XXXIX Number 7.

Dry-rot in Timber.

This subject is of great importance to carpenters, ship-builders, lumbermen, and house-owners, and of curious scientific interest, has been thoroughly examined by Mr. T. A. Britton, an eminent English architect, who has exhausted nearly all source of information. He says, that to understand the nature and effects of dry-rot, we must inquire into the structure and properties of wood, which consists of a mass of slender, short fibers, with tapering ends, overlapping each other. These fibers are hollow at first, but are gradually filled by the deposition of solid matter from the sap within them.

This woody fiber, which pervades the tree from the tips of the roots to the extremities of the branches, is the chief organ of circulation. A current of sap passes upward through it, from the roots to the leaves, and another current, containing the products of leaf-action, passes back from the leaves, and is distributed for the uses of the tree. Wood grows darker as it grows older, owing to the deposit within the fibers, and reaching maturity no longer joins in the general circulation. The inner or heart wood, being fully matured and without sap is less liable to decay than the outer sap wood, sap being the agent of destruction. Sap being composed of water, sugar, albumen, gum, etc., ferments easily and rapidly, and is the most fatal cause of decay in wood. Wherever sap is the cause of decay it is termed ordinary rot or wet-rot. Dry-rot, although so termed, can no more occur without moisture than wet-rot. The former is one of the consequences of the latter, and begins after the fermentation of the sap begins, all of the conditions are then ripe for the inroads of dry-rot. Moisture favorable to natural decay and to the growth of plants is essential to its progress. The immediate agent of destruction in the case of dry-rot is of vegetable origin, belonging to the natural group of fungi, the best known representative of which is the common mushroom. If you examine the mold on which this plant is seen to grow, you will find it penetrated with delicate, whitish, interlacing filaments, which are the vegetative system of the plant. This part of the mushroom is called the *mycelium*, and from it arises the reproductive portion which grows above the ground. The umbrella-like cap above the ground bears the minute reproductive bodies of the fungi, called spores, analagous to the seeds of common plants. The mycelium, or thready interlacing portion which grows underground, and the minute microscopic spores, which are so small that thousands of them are required to form a body the size of a pin's head, are common to all fungi.

The mycelium is often so minute as to traverse living plants and the pores of solid wood. It grows rapidly and causes quick decay. Potato-rot, the yeast and vinegar-plants, mildews, rusts, and smuts of grain, and molds of all kinds, are part of this immense group of plants that lives upon decay and fills the air with its countless myriads of spores. These germinal particles are lodged everywhere. They are as light as vapor, and abound in air, in water, in sand, in dust, ready, when warmth and moisture favor, to burst into life. The dry-rot fungi flourish upon the products of wet-rot. Different stages of decay produce food of different qualities, adapted to different species of fungi. One species takes up the process where another leaves it, and carries it further and further forward.

Dry-rot may begin its ravages in the interior of timber as easily as upon the surface. As atmospheric dust is filled with the spores of fungi, they may be conveyed by rain into the earth, absorbed by the roots of vegetables, and diffused with the sap throughout the whole plant. It is not necessary to mention the great variety of fungi originating from these atoms or spores which exist everywhere, and produce many of our malarial diseases and diphtheria. We shall refer only to those concerned in the process of dry-rot.

There are several species of fungi causing the destruction of timber, the principal being the *Merulius lachrymans* (often called *the* dry-rot), the most formidable enemy of timber. Wood affected by it, shows minute white threads of a cottony texture which sheds a red powder, which is the *Merulius*. Long before this appearance is manifested, the interior of the wood has perished, and when the cottony filaments are seen upon timber internally affected, we may be sure the apparently solid beam may be crumbled to dust between the fingers.

The first symptoms of dry-rot in timber are swelling, discoloration, moldiness, and a musty smell. As the disease advances the fibers shrink lengthwise and break, presenting many deep fissures across the wood; finally, the cohesion of the wood is utterly destroyed, and at the least disturbance crumbles into powder.

An indication of dry-rot in a damp pantry will be a coating of fine powder, like brick-dust upon the shelves and earthenware; those being the reddish spores shed by the dry-rot fungus.

The best protection against this rot, is careful seasoning. Ventilation is not of great use. Timber must be kept either entirely wet or entirely dry. Alternate dampness and dryness is fatal. Boiling and steaming is useful in getting rid of the spores and coagulating the albumen of the sap. Let the sap out, then do not permit the absorbtion of any moisture, and wood will not rot.

THE INCREASED DEMAND FOR CALIFORNIA WINES.—The New York *Wine and Liquor Circular*, of August 11th, shows the importation to this port of French still wines in July, to be nearly 111,000 gallons, besides an increase of about 250 cases, against 47,000 gallons in July, 1878. The editor says the trade with California is wonderfully extending. So far this year fully 1,000,000 gallons of wine have come from California, and 100,000 gallons of brandy.

Drake's Cement Machine.

Our engraving represents the application of Drake's cement machine to hydraulic works. The machine itself consists of a cylinder composed of bars of metal of a suitable shape to break up the material passing through it. The cylinder is revolved, and being set on an incline, the material passes from one end to the other. A perforated pipe passing through the cylinder furnishes a constant supply of water to the material being worked. The precious metals and finer dirt passes through the bars into the sluice, while the larger rocks, etc., are discharged down a slope, or are carried away.

As applied to hydraulic mining, the mill is run by hurdy-gurdy wheel, with water, or by steam power, as desired. In working the hard gravel and cemented banks, in which this country abounds, the present difficulty is in perfectly disintegrating the hard gravel in piping it into sluice boxes, so that all the gold contained therein may be saved.

This machine is set in connection with the sluice boxes, as shown in the engraving, so that all that portion which has become fine by piping or blasting, flows through a grizzly, leading under the mill to the opposite end, while the hard gravel passes into the mill, there being disintegrated by being rolled over and over on the bars in the presence of water. The bars are made with sharp edges, being made of T iron fitted with a plate of steel, so there is practically no wear, the mutual attrition of the pieces aiding in the disintegration. The fine stuff drops between the bars into the sluice, the stones passing through the mill, and dropping from the discharge into the same sluice box, and passing on to the undercurrents below. This saves all necessity of having drops below to break up the material.

This system will allow the working of hard cement and gravel banks at the same price per yard as ordinary hydraulic gravel can be worked. Moreover, as no "drops" are required, the simple grade of a sluice box only is needed. The mass of rocks, gravel, etc., being ground over and over in the mill on its way down, is broken up much more effectually than any drop will do. The whole expense of working cement by this machine, when put in with cars, is about 25 cents per square yard, when working from one to two thousand tons per day. When put in through the sluices, some 5,000 tons a day, or more, could be put through at an expense of between two and three cents per yard, with a greatly increased result in yield of gold.

These mills are of several sizes and not expensive. Messrs. Prescott, Scott & Co., Union Iron Works, San Francisco, manufactured one of these mills of the largest size for the New York and Calaveras Mining Co. last season, and it does an enormous amount of work at little cost. They will furnish all desired information concerning the mill to those addressing them on the subject.

The upper engraving represents a side view of hydraulic works, indicating the position of the mill. The lower one is a plan view, looking down from above. The mill is put, preferably, as near the bank as possible, so as to save length of sluice. No attention is required after water is turned on to the hurdy-gurdy and the cylinder once set in motion. Mr. H. K. Drake may be addressed at No. 28 Sansome street, this city.

New Zealand Gold Fields.

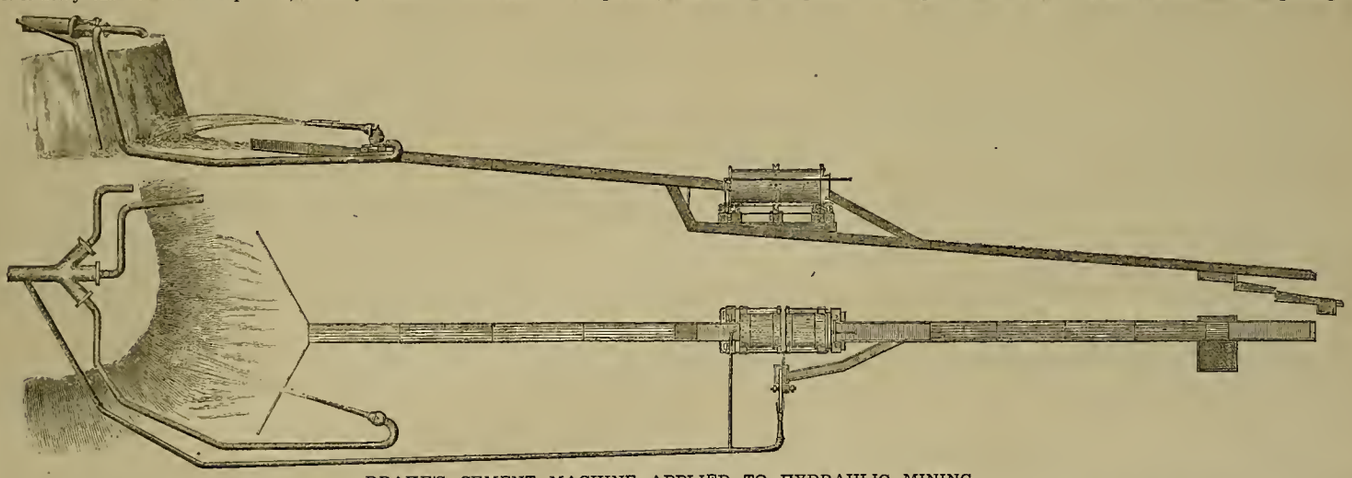
Late news from New Zealand, through the *Thames Advertiser*, shows that trouble has been experienced by the Auckland capitalists in pumping their mines. It appears that the gold duty exacted from the mines was so large as to destroy all benefits from the product, and at a meeting of the representatives of the mining companies to obtain some relief from the payment of the gold duty, it was finally agreed to keep the pumps working to drain the mines, provided the Borough Council should contribute to the companies a certain amount per month out of the gold duty. The Council agreed to contribute the whole of their gold duty for 12 months, provided the amount did not exceed £50 per month.

The Moanataiari mine is improving. A nice looking leader, supposed to be the Golden Age reef, was cut in the tunnel a short time ago. It is four feet thick. The Kuranni turns out a good quantity of fair dirt. In the Waiotabi the men are extending a drive on the No. 4 reef, 3d level. The stone is hard, but good.

Excellent gold has been obtained from the Golden Calf up to a recent date, but has been swamped by the stoppage of the pump. In the Albionia the reef in the Sons of Freedom tunnel is being cut. Rock hard, but very nice. An assay yielded one ounce to the ton. The lode is of good size and looks promising. In the Caledonian the pay dirt is of average quality. Sinking is going on on the No. 3 lode, 2d level, with gold showing all the way down.

California (Taraiu): During the month Mr. Cook, the proprietor of this claim, has had two first-class returns from stuff broken from the well known black reef. The stuff is very dry and soft, and resembles a deposit of soot, and is treated very cheaply at Mr. Cook's own battery, near the claim. Portia (Karaka): About the beginning of the month a slip of earth occurred in this claim, and disclosed the existence of a first-class gold-bearing reef, which is now being worked. A small parcel crushed went an ounce to the pound weight of stone. At Ohinemuri a good deal of work is proceeding, principally by tribute parties. As a rule the Smile of Fortune (Owharoa) tributers are getting pay gold.

WITHIN about two weeks the New York city banks have paid into the Sub-Treasury the enormous sum of $55,000,000 in legal tender notes, in payment for 4% bonds.



DRAKE'S CEMENT MACHINE APPLIED TO HYDRAULIC MINING.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds

Quartz Mining Around Nevada City.

EDITORS PRESS:—It is refreshing in these dull times to run across a lively camp. The mines of Nevada City are, perhaps, making a better showing to-day, or giving a brighter promise, at least for the future, than at any previous period.

One of the main causes for the late impetus to quartz mining, is the discovery of a very large "contact vein" or lode 160 feet or more from wall to wall, better known here as the Providence belt, from the mine where the most important developments were made. This fine belt of auriferous ore crosses Deer creek, about a mile below the city, extending a considerable traceable distance on either side and consists, as made manifest by the deepest workings, of several quartz veins, running parallel within the main fissure between the slate and granite—all showing a gradual tendency to concentrate with less and less gangue—in short, a marked improvement both in the quantity and quality of the ore as a greater depth is attained. The following are the principal locations: The Nevada City, Wyoming, Champion, Merrifield, Providence, Crosby, El Capitan, Transcript, Live Yankee and others. The most of them are said to contain good bodies of ore, in some cases very rich in gold-bearing sulphurets, and promise at no distant day to become dividend-paying.

The Providence,

Now down to the perpendicular depth of 1,000 feet, is looked upon here as the leading mine of the district, if not ahead of all others in the State.

Many interesting details from other reliable sources could be added to those cheerfully furnished you for publication by the company last year, all of which are withheld out of regard to an expressed wish on their part, backed by good and satisfactory reasons, that nothing in the way of special facts or figures should just at this time emanate from them. Two or three general remarks will be indulged in.

It has the first and greatest essential for a good mine—rich ore and plenty of it—and second and scarcely less important, it enjoys the strict, watchful attention of its principal owners, being worked and managed by them in person and with something of the same system and economy that the prudent merchant or manufacturer brings to bear in his line, which will account for much of its success and the stand it has taken among the best mines of the day.

The Consolidated Wyoming

Has a present depth of shaft of 500 feet; length of ore chimney on 2d level, 510 feet; 3d level drifts have run 250 feet on the ore chimney, are in ore still and expect to contain much more ore than the 2d level both in thickness of ledge and length of chimney. The 4th and 5th levels both have fine ore, but are in but a short distance from the shaft. At present are running 10 stamps, but the mill capacity will be doubled by October 1st. The mine is now drained to the 5th level by a tunnel 2,000 feet long.

The Merrifield

Is one of the oldest locations in the district. Lode from 2½ to 18 feet wide, encased in granite. Greatest depth of old shaft, 600 feet. The new shaft, located 1,600 feet farther north, is now down 250 feet. The mill is run the greater portion of the year by water and the remainder by steam, crushing at present 26 tons per day, the results represented to be satisfactory to the company.

The Nevada City

(Formerly the Schmidt) is located on the northerly portion of the same belt and within a few hundred yards of the Providence, Wyoming and Merrifield. The present owners purchased the mine last winter, since which they have erected substantial buildings and steam hoisting works of sufficient capacity to develop the mine to the depth of several hundred feet. The mine had been previously worked a number of years, but for want of proper machinery had not been sunk much below water level. Several hundred tons of ore were taken out, milling from $20 to $70 per ton in fine gold, the sulphurets running from $200 to $600 per ton of same. The late owners have sunk an incline 150 feet and are running levels from that station. Within the past week or so they struck the ledge in this level, which shows a width of at least two feet of good rock, carrying also a large percentage of sulphurets. It is one of the most promising of the later developments, and bids fair to rank soon among the best mines of the county. Mr. J. W. Sprague, the Superintendent, will soon commence hauling ore to a custom mill for reduction. It is his intention to erect a 10-stamp mill the coming season.

The El Capitan

Is situated on the south end of the Providence lode, and is represented to have the same series of veins that appear in the Providence proper. It was opened in early days by tunnel 600 feet in length to get backs of 50 feet. Heavy machinery is now on the way from New York. As soon as it arrives a shaft will be sunk to the depth of 200 feet and work pushed vigorously and systematically. It is said to be very favorably located and has a bright future before it. It is owned by a New York company and superintended by Mr. Francis Burns, who will hereafter furnish you, no doubt, with many valuable facts in regard to the mining of this section.

A sufficient number of examples have been cited, but a very faint impression of the value of this belt of mines has been conveyed in the skeleton-like sketch here given.

We turn now to another range and to other mines that will compare favorably with some of the best of those mentioned.

The Deadwood,

Located 2½ miles above Nevada City, is from 6 to 18 inches in width, lying wholly in granite. A drain tunnel, which taps the ledge at the depth of 60 feet, constantly discharging full 12 inches of water, effectually rids the mine of the greatest impediment it had to contend with near the surface. The company are now running an incline on the ledge and are at work on the 300 level. The ore for the past year or from the opening of the mine has run from $20 to $60, averaging $36 per ton. The mine, until quite recently, was run under lease, paying the lessees four dividends, the first covering all the assessments, besides paying the company for royalty and the erection of hoisting works at a cost of $3,500. The company have purchased and fitted up anew the Oriental mill, which is now in operation. The last crushing yielded at the rate of $60 per ton, inclusive of the value of the sulphurets. The consequence is that the stock was never more firmly held, a dividend being confidently anticipated at no very distant period. The 8-stamp mill is run by water power, with the use of only 20 inches, pressure 380 feet.

The Murchie,

On the opposite side of Deer creek, is opened by incline shaft to the depth of 666 feet, with four levels. Average width of lode, five feet, most of the ore for that width being extracted and worked. At present the company is taking out 40 tons per day and milling 36, the ore averaging $30 per ton. The two lower levels are nearly virgin ground throughout and the ore represented to be of the highest grade, going into the hundreds. In addition to this very valuable property, the company are now opening up two very promising mines on the outside. The ore is conveyed from mine to mill by a tramway, 900 feet in length, at a cost of less than 10 cents per ton. They run 18 stamps and have recently put in eight of the Frue concentrators, which appear to be giving entire satisfaction. The ore is very heavy in sulphurets, running from 5% to 33% of the gross amount of ore. The loss of sulphurets by this machine is said not to exceed 15-100 of one per cent. The concentrators had been run a little upwards of 30 days, during which time they had more than paid for themselves.

The Pittsburg Mine

Has a linear extent of about 3,500 feet. The greatest depth reached is 800 feet, and the usual amount of stoping and drifting going on from the 500 level to the 800 level. The lode is from six inches to two feet wide, and said to be showing well at present depth, the ore milling about $20 per ton free gold. From five to ten tons of rock yield one ton of sulphurets worth $100 per ton. Their 10-stamp mill and five of the Hendy concentrators are constantly running.

It is understood that the

New England Mine,

Now down 600 feet, has been yielding some $10,000 per month, first-class ore going as high as $40 per ton, exclusive of sulphurets.

The Idaho and other mines at Grass Valley are believed to be doing the usual amount of work and yielding about as formerly. My stay was too short for notes.

The Ironclad Mine,

The property of Mr. John Cammet, formerly of your city, is represented to be sufficiently developed, and to have enough ore in sight to keep a 10-stamp mill running a year. There is also a fine pay chute, thought to contain from $60 to $100 ore.

Across the Sierras by a New Route.

New Mining Districts of Fresno and Mono.

EDITORS PRESS:—Since the discovery of the valuable mineral ledges of Lake district, Mono county, on the headwaters of Owens river, the question of the shortest practicable route to same from any railroad station has been one of the highest importance to all interested in the new mines. Learning in Fresno Flats of the new route by road and trail from that point to Mammoth City for pack animals, as well as the saddle train of John S. French, former engineer in constructing the Madera flume, your correspondent concluded to ride over, examine and report upon the route, its difficulties, altitudes, etc., the new mining districts on the upper San Joaquin, in Fresno county, but a few miles northwest of Mammoth City, and cross into Mono county for a few days to see the great Mammoth mine, of which so much is being said, as well as neighboring claims near Mammoth and Pine City. For this, Mr. French and his partner, Mr. Wellman, kindly offered me every facility.

To Measure Altitudes,

Mr. John Haley, Superintendent of Enterprise mine, did me the great favor to lend his aneroid barometer, a very accurate instrument of the kind, made by James How, 2 Foster Lane, London. In his office at the mine it indicated regularly an altitude of 2,900 feet. Being well aware of the temporary effect of fluctuations in the state of the atmosphere on such instruments, I determined to carry a thermometer also, that the temperature of air might be recorded at time of observing altitudes. The accompanying table will give results in brief.

I hope these results will prove of some interest to your readers, though they must, of course, be looked upon merely as approximations, so far as distances and altitudes are concerned. Though but brief time could be taken for each observation, as the distance of some 60 miles had to be made in about 27 hours, yet there were several circumstances favorable to and confirmatory of their general accuracy. Hence, I venture to present them with some confidence that more elaborate observations and corrections by others in future will, in the main, confirm the hights here given.

These Favorable Circumstances

Are: 1. The good repute of the instrument used and its good condition at starting; 2. the fact that July 1st quite a severe thunderstorm purified the air, so that from the 4th to the 15th, the time during which the observations given in table and many others were made, the air was in a calm and uniform condition well suited to the use of the aneroid; 3. comparisons at Mammoth with an American aneroid of Mr. S. C. Farnham, Superintendent of the Don Quixote and Monte Christo mines, gave about the same altitude, 9,500 feet, for Mill City, where the Mammoth mill is located; 4. Mr. Haley's aneroid made the altitude of the mouth of shaft of the Head Light claim—the southeastern extension of the Mammoth mine—11,000 feet, which Mr. Lilien, United States Deputy Surveyor, informed me corresponds well with other measurements of neighboring hights. The distances along the trail are made out from estimates by those best acquainted with the route and from personal observations based on time and speed of transit.

Table of Altitudes, Distances, Temperature and Time.

Total Distance. (Miles.)	Distance Apart. (Miles.)	STATIONS.	Altitude. (feet.)	Temp. (Fahr.)	Hour.
		Fresno Flats	3,150	88°	2:30 P. M.
2	2	Salt Springs	3,250	90°	3 "
7	5	Saw Mill	5,350	81°	4:30 "
16	0	Lookout Point	7,200	58°	6:30 "
18	2	Beasore Hill	8,350	50°	7:20 "
19	1	Beasore Meadows	7,600	50°	8:10 "
26	7	Chiquita Joaquin Ford	7,375?	46°	6:50 A. M.
36	10	Granite Creek Ford	7,700	61°	9 "
39	3	Top of W. N. Fork Hill	8,500	63°	10 "
40	1	Bridge over North Fork	6,000	56°	10:30 "
43	3	Enslin's Sheep Camp	8,600	70°	12:45 P. M.
48	6	Top of King Creek Hill	10,000	64°	2:30 "
40	1	Ford of King Creek	8,500	63°	3 "
63	4	Bridge over main San J'q'n	8,300	60°	4 "
64	1	Potts' Meadows	8,500	56°	4:20 "
68	4	Pumice Stone Gap	10,350	63°	6:30 "
59	1	Pine City	9,850	68°	Noon.
60	1	Mammoth City	9,700	52°	7 A. M.

The Saddle Train

Leaves Fresno Flats every Tuesday and Friday between 2 and 3 P. M., on arrival of the bi-weekly stage from Berenda station, arriving at Mammoth City between 5 and 6 P. M. next day. The same days a corresponding train leaves Mammoth at 5 A. M., reaching Fresno Flats about 10 A. M. Wednesdays and Saturdays. Both trains meet at a comfortable camp provided by Mr. French—otherwise dubbed the French hotel—the only night out in Beasore meadows, named after J. P. Beasore, a pioneer of these Fresno county Sierras. The general course of the route is slightly north of east. At the regular hour, July 4th, Mr. French started with three traveling companions, one of them, Mr. Whittaker, of New York, a shareholder in the Mammoth, whose congeniality and experience as a traveler added much to your correspondent's enjoyment of the trip.

At the Madera flume company's mill the aneroid enabled me to detect an error in the altitude of the site as reported to me and given in your columns in a previous letter. As shown in accompanying table it is

5,350 Feet Above Sea Level,

Or over a mile, instead of 4,800, as before given me. Hence it is about 5,000 feet above Madera, and the fall in the flume, the first five miles from the mill, is over 2,000 feet. Other information since confirms this correction.

The trail is entered five or six miles beyond the mill at an elevation of 6,300 feet, and continues for, at least, 45 miles to Pine City. For this whole distance only three cabins are seen, and not even a single Indian rancheria. On the whole trip we saw no Indian, except at the two ends of the route. There is a cabin occupied by wood choppers three miles beyond the mill, one at Beasore meadows, used in summer by Hildreth's vacqueros looking after about 500 head of cattle he keeps there, and an unfinished one in Pott's meadow, five miles west of Pine City. Few lonelier routes of travel can be found in California.

Lookout Point

Commands a fine view of the San Joaquin plains on a clear day. Fresno dome towers up to a hight of about 10,000 feet very near this part of the trail.

When we left Beasore meadows at 5 A. M., July 5th, the thermometer in the open air at 32°, and frost was forming. Temperature of spring water was 42°. At many points along the last day's ride, of 40 miles, the scenery is very varied and truly grand. The best views are from the ridge west of Granite creek, the top of West North Fork hill, the ascent to Pumice Stone gap, and from the notch of the gap in every direction. I shall attempt here no description of the really

Magnificent Panorama

Of canyons and domes, and snow-covered peaks and ridges, that is constantly unrolling itself before the eye of the delighted traveler. It must be seen to be fully appreciated. Tourists and students of nature will do well to try the route. From the table you will see that the descent in a mile, or less, before reaching the single-log bridge across the the true North Fork of the San Joaquin, is 1,600 feet; the rise thence to top of King Creek hill is 3,100 feet; then in a mile to ford of King creek, you descend 1,500 feet; and from the single-log bridge across the main San Joaquin to the highest point in the gap before you descend to Mammoth City is over 2,000 feet. These facts speak for themselves, as regards the wild and rough nature of the route. Yet it is entirely safe, and enjoyed with a zest by one who is well and can stand a little "roughing it." You observe that after reaching the greatest altitude on the route, 10,350 feet, the descent to Pine and Mammoth City is not great, the former being 9,850 feet, and the latter 9,700 feet—about their average hights. The best of pine, fir and tamarack timber is found at altitudes from 9,000 to 10,000 feet. Hence the great timber belt through here is about 40 miles wide.

A Road by This Route

Is much discussed, and is necessarily of greatest importance to Minaret, North Fork, Lake and adjacent mining districts. The first 20 miles to the neighborhood of Granite creek could be made with comparatively light work and cost, say, perhaps, $25,000. Ten miles of road along Summit ridge, from North Fork district to Mammoth City, can be done, the miners say, with little labor and expense. This leaves about 20 miles of road where much heavy grading will be required, and where scarcely less than $75,000 or $100,000 in work and money will be needed. To Madera, Berenda, or Borden, on the S. P. R. R., such road would be about 100 miles, and would greatly diminish time and cost of freight from San Francisco. At present freight from San Francisco is usually sent to Mohave, Kern county, and thence hauled in wagons through Owens River valley by the Cerro Gordo Freighting Company, at $5 per 100. Let the numerous fine mines now developing in that region prove as good as they promise, such road becomes a necessity and will be made.

J. W. A. W.

Fresno Co., July 20th.

Prospecting in Mono County.

EDITORS PRESS:—Not willing to lose an opportunity of informing the public on any mining interest, I present the following resume of a two weeks' prospecting tour in the vicinity of Bodie. Equipped with a pack animal and the proper implements I left Bodie in company with an old '49er, rather a rough customer, but a man whose experience in prospecting has been the very best. Our tramps were about 12 miles per day, and at the end of each day's travel camp was fixed, and the remainder of the day devoted to exploring the neighboring country and prospecting with pan for placer diggings and pick and shovel for ledge croppings. In favorable localities a day perhaps was spent in a single place. Our route lay southwest of Bodie and about Mono lake; in brief, we took the Sonora road to Mormon ranch, from thence to Dogtown and over to the old Mono diggings; then Mill creek was explored, and by coming around Mono lake the trip was finished. Throughout our course we met with mines, some producing a fair grade of ore and others rich ore, but with the lack of milling facilities, in this newly explored region, the work of opening up goes on slowly.

Half way between Mormon ranch and Dogtown the gold on the surface begins, and every swag in the nearly flat country, and every approach to a gulch, contains rich surface washings. Much of this land remains unclaimed because of the scarcity of water; however, I think, that with a small outlay, water could be brought from the creeks in the hills south in sufficient quantities to wash off the rich surface earth, and in any such work I feel sanguine that ledges would be encountered in the vicinity, because of the flatness of the country and the existence of a rich red quartz accompanying the gold. At Dogtown, 12 miles west of Bodie, there is much gold found on the surface running down to a depth of from 6 to 20 feet. Over the whole surface, in this vicinity, we find washings which pay from one-half to two cents to the pan, and in the gulches and creeks the value increases. The richest washings, which lie in Virginia creek, have all been worked once, and there now remains the tailings which are being worked over by Chinamen. Here again, for the extensive surface washings, we find that a small outlay would insure favorable returns were it not for one difficulty, viz.: The farmers above and below will not allow the water to be used for mining purposes, they claiming precedence in its ownership.

To proceed, we find no deep mining about Dogtown, though there must be important

[CONTINUED ON PAGE 102.]

MECHANICAL PROGRESS.

The New Edison Telephone.

The New York correspondent of the *Times* reports a recent private exhibition by Mr. Edison of his new electro-chemical telephone, of which during the last few months remarkable results have been predicted. About 30 or 40 journalists and friends of the inventor went over to his laboratory, where the exhibition was given by Mr. Edward H. Johnson, Edison's chief assistant. Mr. Johnston took first in his hand the receiver of the Bell telephone (the one now best known), and showed its capabilities. As is well understood, the voice transmitted by this telephone can be heard only by putting the receiver to the ear. He then exhibited the Bell telephone with the Edison transmitter, a carbon button, but the voice was still very faint, the articulation being audible only when assisted by the flaring tunnel used in the phonograph. Then he turned to one of the odd-looking contrivances before referred to, which was fastened to the wall, and which looked like a coffee mill with a glass front, and, giving the signal to the sender, who was in a distant part of the grounds, he turned a little crank revolving in the edge of the coffee mill, and it shouted in a voice that startled the listeners, "Halloo! How are you? How do you get this?" The voice was so loud and strong that it might have been heard and distinctly understood 50 feet distant. Indeed, some members of the party went into the next room and still heard it saying,

"Now is the winter of our discontent
Made glorious summer by this sun of York;"

and when the talker turned from familiar verses and read the latest news from a morning paper, and finally read a page of travels from an unknown book, every word was distinctly understood. Some whose ears were not familiar with the peculiar half-muffled, half-metallic voice of the telephone and phonograph missed some words, and some acquaintance with the instrument seems to be essential to a complete understanding of all its speech. This telephone contains no magnet (which has hitherto been regarded as essential), and that Mr. Edison has substituted for the magnet a carbon button transmitter at the end where the speaker stands, and a small revolving cylinder of chalk at the end where the hearer awaits the message. This spool of chalk is turned by the crank before mentioned, and its virtue seems to reside in the caustic soda with which the spool has been thoroughly saturated, which, Edison explains, must crystallize and polarize before becoming effective. On this spool rests a steel tongue, about as large as the wooden toothpick of commerce, free at one end, and at the other fastened in the center of a disc of mica, which it causes to give vocal vibrations like the mica disc in the phonograph. The visitors experimented with the new phonograph in every conceivable way, and the conclusion shared by all was that it is so much more powerful than any other phonograph as to lift it almost above rivalry. Experiment also showed that the voice is really magnified in transmission, and delivered in a louder tone than that employed by the speaker.

The Writing Telegraph.

Cowper's writing telegraph has been placed on the London and Southwestern railway, and it works most successfully, says the *Engineer*, from Woking to Waterloo, a distance of 26½ miles, writing off the messages in ink, one after the other, in a perfect legible manner, whether regular line messages or messages made up in order to give the instrument more work to do. On some days more resistance coils of wire have been introduced into the two line wires, in order to represent greater distances, and thus 62½ miles and 99½ miles have been worked through in a most satisfactory manner, it only being necessary in such cases to add a few more cells of the battery, which in no case was as powerful as is very often used on the same line. The effect of the currents through the multitude of other line wires, in close proximity to the two in use for the writing telegraph, was closely observed, and the effect of induction was so exceedingly small as only to produce occasionally a slight roughness in a straight line, when the pencil of the operator was quite stationary, but such effect was hardly ever perceptible in the writing itself, and never to affect its legibility.

The fact of this instrument requiring no clerk to receive the message, translate and write it down, seems to be much appreciated, as a half-dozen such instruments may be telegraphing their yards of messages into one office without the least assistance from the clerk, who may, from time to time, cut off and send out the ready written messages; so that not only is the time of "calling" (as with ordinary instruments) saved, but the time of waiting till the clerk can attend at the other end of the line to receive the signals, which very often amounts to a much longer interval than is required for the whole message to be transmitted, especially in offices fitted with many instruments.

There is also a great advantage in having an absolute record of what has been sent by the writing telegraph at the transmitting station. Another very important feature is the facility with which all that it is necessary to learn to use the instrument may be found out in five minutes. Every operation is exceedingly simple, and there are practically no fine adjustments anywhere. Variation in the power of the battery is of no importance, as its effect may be overcome by simply pushing the levers, carrying the springs against which the needles pull a little further in or out, as may be necessary. The pen, which is a very small glass capillary siphon tube, is, though of glass, very strong—it may fall several feet on to a bare floor without breaking—and is very easily adjusted.

The Electrical Alarm Compass.

A short time since Mr. Henry A. Severn, of Herne Hill, England, brought out an ingenious compass alarm for use on shipboard. Its purpose is to make the compass signal automatically any considerable deviation of the ship from a desired course. Over the compass card are placed two index hands which can be adjusted to any angle; and these hands are so connected with an electric alarm that the moment the compass needle passes the limit of variation prescribed an alarm bell will ring in the captain's office, and continue ringing until the ship's proper course is restored. In this way any departure from the ship's course, as ordered by the officer in command, whether due to the steersman's inattention to duty or to a misunderstanding of the orders given, will be instantly made known. Of course when the officer gives his orders to the steersman he sets the index hands to correspond, and after that he is relieved of the necessity of constant observation of the compass to be sure that his order is strictly carried out.

This invention is just now receiving much attention in the scientific and other journals in England; and it is currently described as novel as well as likely to be useful. Its novelty, however, is open to question. In principle, and apparently in mechanical construction, it is substantially identical with the electro-magnet attachment to ship's compasses patented in this country by Alfred Foucaut, July 19th, 1870.

The essential part of the claim for this patent was the construction and arrangement of a compass, so that, by reason of any material variation in the route of the vessel, the needle of the same would close an electrical or magnetic circuit and sound an alarm.—*Scientific American.*

RAISING COAL CORVES.—The essential feature of the invention of Mr. C. Jeanson, of Paris, is the use of endless chains passing over and under pulleys at the pit's mouth or other situation, and under a pulley at the bottom of the shaft, also in a guide fitted within the shaft for preventing the slip of the chain, should say, the up running portion be weighted out of proportion to that of the other or down running portion, or *vice versa*. The endless chain or chains carry at intervals a series of projections which take hold of the trucks, wagons, or corves when they are pushed along a line of rails in proximity to the lower pulley, in order that they may be lifted. The trucks in the shaft while being lifted pass between pulleys which guide the chain or chains; these passing through a break or equilibrium apparatus to prevent them slipping should they be unequally weighted. The equilibrium apparatus is composed of a framework between which are chain wheels having sprockets or teeth to engage with the links of the chains, and against which rollers press to keep them in contact. The apparatus is suspended in the shaft and is under the control of weighted levers, which produce an equilibrium or balancing of the loaded trucks with the empty ones. When the trucks arrive out of the pit or shaft they pass between an upper set of pulleys, and become deposited upon the ground or upon rails to enable them to be moved away as desired, each truck as deposited releasing itself automatically from its connection with the chains.

ROCK DRILLING BY ELECTRICITY.—The application of electricity for the purpose of drilling or boring rocks has been suggested by M. Gaston Plante, the inventor of a process of engraving on glass by the same agency, which was made known in 1877. In the latter process, one of the electrodes conducting an electric current of high tension, being brought in contact with the glass, in presence of saline solution, acts like a graver or diamond, by tracing grooves in the surface of the glass, and even digs into it quite deeply. In spite of its great hardness, rock crystal can also be attacked by the same method; and, if not engraved regularly, it at least cracks into small fragments, and is finally disintegrated. Under conditions analogous to these, the electric current might be substituted for diamonds in the operation of drilling rocks. M. Plante states that electrodes of platinum would not be necessary, for here it is not the metal of the electrode that is affected, but the silicious matter, in contact with a saline solution. Metallic points or projections, suitably located at the extremity of the drill, isolated on a part of its length, and actuated by a rotary movement, would lead the electric current to the surface of the rock to be pulverized, and would thus replace those numerous and expensive diamonds which are set in the head of the drills employed in the present system of rock-boring.

SCIENTIFIC PROGRESS.

Meteors and Meteoric Phenomena.

When observers band together to watch every quarter of the sky, and to keep on the lookout through the whole night, the number of meteors that present themselves is very great. In this way it has been ascertained that upward of 30 on the average, which are conspicuous enough to be seen without instruments, come within the view of the observers stationed at one locality. And it is computed that telescopic meteors must be about 40 to 50 times as numerous as those visible to the naked eye.

These results may be obtained from observations made at one station; but when concerted observations are carried on at different stations several other facts of interest come to light. By simultaneous observations at distant stations, it has been discovered that the hight of meteors above the surface of the earth usually ranges from 120 down to 20 miles, the average hight being about 60 miles; that the direction of their flight is toward the earth, either in a vertical or in a sloping direction; and that their speed in most cases lies between 30 and 50 miles a second.

We thus arrive at the conclusion that visible meteors are phenomena of our own atmosphere; and as the atmosphere reaches a hight, at most, of 150 miles, and is, therefore, but a thin film over so vast a globe as the earth, it is obvious that the spectators at any one place can see only a very small portion of the meteors which dart about through all parts of this envelope. After making allowance for this, we are forced to conclude that no fewer than 300,000,000 of these bodies pass daily into the earth's atmosphere, of which about 7,500,000 are large enough to be seen with the naked eye on a clear night, and in the absence of the moon.—*Popular Science Monthly.*

WHERE DID MAN ORIGINATE?—The various writers and thinkers on the subject of pre-historic man generally concede that the races of to-day have radiated over the globe from some point in Asia. Indeed, the traditions of different nations lead to the conclusion that this point of dispersion was located in the high central regions of that country. There, apparently, the dog, horse and ox were first domesticated, and can at the present time be found in their natural, wild state. Hudson Tuttle says, in his "Arcana of Nature," that "man originated near the equator, where the climate was better adapted to his defenseless condition and food abundant." This conclusion seems to be based upon the impression that the different zones of the earth occupy the same relative positions now that they have always done, and can hardly hold good in view of recent developments. Colorado, an almost unexplored country, comparatively speaking, to the scientific world will be apt to change the logical reasonings that have so far been advanced upon this interesting subject. Senor Altamirano, of Mexico, the best Aztec scholar living, claims the proof is conclusive that the Aztecs did not come to Mexico from Asia, as has been long universally believed, but that they were a race originated in the unsubmerged parts of America, as old as the Asiatics themselves, and that that country may even have been peopled from this. From the ruins recently found, the most northern of any yet discovered, the indications of improved architecture, the work of different ages, can be traced in a continual chain to Mexico, where they culminate in massive and imposing structures, thus giving some proof by circumstantial evidence to Altamirano's reasoning. But now, as to the antiquity of American man as shown by the yet recent discoveries in Colorado.—*Popular Science Monthly.*

PHOTOGRAPHY IN COLORS.—Capt. Abney recently submitted to the Royal Society, London, some pictures of the solar spectrum on silver plates, and also on compounds of silver, held in place by collodion. The natural colors of the spectrum had impriuted themselves on the plates, those on the silver being more brilliant than those on the collodion, but the latter could be seen both by transmitted and reflected light. Without entering into details of the process by which he obtained the pictures, he stated in general terms that they were produced by the oxidation of silver compounds during two minutes' exposure with a wide slit. Many months ago, when Becquerel showed examples of natural colors, effected through the agency of light, Capt. Abney said that the probable explanation of the result was the oxidation of the silver compounds employed; and he is now confident that he was then correct, that the colors are not caused by interference. The coloring matter seems to be due to a mixture of two different sizes of molecules of the same chemical composition, one of which absorbs at the blue end and the other at the red end of the spectrum, and the sizes of these molecules are unalterable so long as they are exposed to the same wave lengths as those by which they were produced. He believes it possible and probable that the colors may be preserved unchanged when exposed to ordinary daylight.

MAGENTA DYE.—By permitting vanadium to act at 200° Centigrade, on a mixture of nitrobenzol and commercial aniline, or on a mixture of pure aniline and nitro-toluol, Schmidt and Baldensperger, of Mulhouse, claim that an excellent magenta can be produced in either case.

FOSSIL RHINOCEROS IN SIBERIA.—In a communication to *La Nature*, A. Hoffmann, of Moscow, announces the discovery, in Siberia, of the head of a rhinoceros (*Rhinocerus tichorhinus*), which still retains, in a wonderful state of preservation, nearly all its covering of flesh. "This head," he writes, "was found near a small stream, called the Balantai, a tributary of the Yany, at the distance of some 200 versts from the city of Vorshvianska. M. Gorokoff, to whom we are indebted for this discovery, made haste to communicate with the Imperial Geographical Society of St. Petersburg. A member of that Society, M. Tshersky, to whom the head was submitted for examination, says that it must have belonged to a young animal, for some of the teeth had not as yet quite come out from their alveoli. The entire head is covered with a strong tissue, hardened by time; but one side of it is badly injured. Here the flesh is in part decayed and crumbles away. A portion of the skull is bare, and we can see the dried muscles and veins; also, a portion of the spinal marrow, the latter having dropped out of the passage through the second cervical vertebra. This curious fossil head retains in perfect preservation the muzzle, the lips, the ears, the hair of half of the left side, a good part of the forehead, and on the right side of the upper portion of the neck, and several other parts. Further, we notice the places for two horns."

SPECIFIC GRAVITY BALANCE.—M. Ganual has recently devised a simple means of determining the specific gravity of liquids. With his densimeter hydrostatique all calculation is obviated, and the specific gravity is ascertained by simply reading the weight on the balance. The apparatus is made in the form of an olive, so that bubbles of air shall not attach themselves to its sides. The olive of glass or metal has a volume exactly equal to one decimal subdivision of a cubic meter. There are two different methods employed in the practical use of the apparatus. 1. We may suspend it on the platform of the balance, and after having produced an equilibrium, we plunge it into the liquid; the equilibrium is then destroyed by the loss of weight of the olive, and the number of grammes which it is necessary to add to the scale-pan to restore the equilibrium is the exact specific gravity of the liquid. 2. Or the liquid whose specific gravity we desire to ascertain may be put in a glass vessel on one pan of the balance; balance the scale-pans, and then suspend the olive in the liquid by means of a fine thread. The equilibrium is destroyed, and the scale descends on the side on which the olive is suspended, and the weight, which it is necessary to place in the other pan to restore the equilibrium, is equal to the specific gravity of the liquid.

STEEL FROM PHOSPHORIC PIG.—Mr. James Henderson, in a circular recently issued, calls attention to his patent, No. 106,365, dated Aug. 16th, 1870, for making steel from phosphoric pig, with the aid of fluorspar and iron ore, in an improved gas reverberatory furnace lined with lime or magnesian lime, so prepared that it can be put in as dust and harden rapidly under the action of a high heat, thus rendering repairs an easy matter. Mr. Henderson estimates the cost of reagents, coal and labor at $2.14 per ton, on the basis of an output of 60 to 70 tons of steel in 24 hours, from a furnace costing $4,000. The waste is replaced by the amount of metal reduced from the ore, while the value of the clay produced is considered equal to one-half the cost of the fluorspar, which reduces the figure given above to $2 per ton. Early experiments made by Mr. Henderson, have taught him that the action of fluorine and oxygen remove the silicon, phosphorus and one half of the carbon in 15 to 20 minutes, while the remainder of the carbon is removed in from one to two hours by charging ore. He has found out also, that manganese may be alloyed with iron and steel by introducing oxide of manganese into his fluorspar mixture.

THE WORLD'S TELEGRAPH SYSTEM.—Leaving out the land lines, which connect all the civilized countries of the world with their neighbors, there are now over 70,000 miles of cable crossing the seas and oceans. New submarine telegraphs, rivalling in length the greatest now existing, are soon to be laid. A line from San Francisco to the Sandwich Islands, and thence to Japan—where now 5,000 miles of wire are in operation, though the first were only laid 10 years ago—so as to connect the island groups of the Pacific with the continents of Asia and America, will complete the telegraphic circuit of the globe. The king of the Sandwich Islands has granted a concession for the first part of this final link, and it will not be many years before we shall see it in working condition.

ANCIENT WISDOM.—The ancients knew the elements of science to a wonderful extent, and when Hippocrates declared that "*putrefactio autem supremus est gradus ad vitam*, he laid down a principle which moderne have with the microscope demonstrated to be correct. It would seem as if inspiration attended the investigations of the ancient sage, who, with in his own mind, developed theories which we moderns, with all our learning and progress, have not deemed proper to change.

COLORING FOR WINE.—Nessler has been thus far unable to ascertain when the coloring matters of mallows and hilberries are used to color wine, and he considers it very probable that the natural red coloring of the grape does not differ essentially from these foreign substances.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending July 24		Week Ending July 31		Week Ending Aug. 7.		Week Ending Aug. 14	
Alpha	25½	21	25¾	19	25¾	20	24½	22¼
Alta	8½	6¼	7⅞	6½	7⅞	6½	6⅞	6⅛
Andes	1.05	80c	1	80c	1.30	90c	1.30	1
Alps	....	....	....	....	....	....	....	....
Argenta	1.65	1.30	1¼	1	1¼	1.05	1¼	1
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	50c	40c	50c	....	25c	....	....	....
Baltimore Con	....	....	....	....	....	....	....	....
Belcher	5	3.80	4.30	3.95	4.90	4.10	4.65	4
Belmont	40c	....	40c	30c	70c	40c	95c	70c
Best & Belcher	17¾	15½	17¾	16	19	16½	18½	18
Bullion	6⅞	4.80	5⅞	3.95	6¾	5¼	7	6
Bechtel	1.80	1¼	1.60	1¼	1.40	1¼	1.60	1½
Belle Isle	4.80	3¾	4.40	3¾	4¼	3¾	3.70	3⅛
Bodie	17¾	11¾	14	11	13½	11¾	11⅞	10
Benton	5¼	4	4½	3¾	4.70	3.80	4.15	4
Bulwer	9	6¾	9	8¼	9½	8¾	9½	9
Boyle	....	....	....	....	....	....	....	....
Black Hawk	1½	1	95c	75c	1.55	1.35	1.60	1.30
Belvidere	1.10	90c	1	95c	1	85c	1¼	90c
Booker	1.10	95c	90c	50c	1¼	1.05	1¼	1
Caledonia	2.35	2.05	2.20	2	2¼	2.05	2.30	2.05
California	4.95	4.60	4.95	4¾	5¼	4.80	5¼	5
Challenge	2.40	2.10	2¼	2.15	2¾	2¼	2.60	2¼
Chollar	7	6	6⅞	5¾	7½	6	7¼	6¼
Confidence	11	10½	11	10	12¾	10¾	12¼	11¼
Con Imperial	1.65	1¼	1.40	1.15	1.60	1¼	1.55	1.30
Con Virginia	4.80	4.60	4.70	4.60	5⅞	4.60	5⅞	5
Crown Point	5	4	4.40	4	5¼	4.40	4.80	4½
Con Washoe	....	....	....	....	....	....	55c	50c
Champion	90c	50c	70c	50c	55c	50c	50c	40c
Concordia	15c	....	....	....	....	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	20c	15c	15c	....	....	....	....	....
Daney	....	....	....	....	2½	....	....	....
Day	20c	....	20c	15c	15c	....	30c	....
Eureka Con	16	15	15	14⅝	15	14½	15	14½
Exchequer	6	5	5⅞	5	6½	5⅛	6⅞	6
Endowment	45c	40c	....	....	40c	....	....	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	3.90	3⅝	3¾	3.60	3¾	3.55	4	3.90
Gila	1¼	1.05	1½	1⅛	1.40	1.20	1½	1.30
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	13¾	....	14	13	13	12½	14	13
Goodshaw	50c	40c	40c	25c	40c	30c	55c	25c
Gould & Curry	10	8	9¼	8¼	11¼	8⅞	11⅜	9⅝
Hale & Norcross	14¾	11⅝	13	10¾	15¼	11⅝	14½	13¾
Hillside	1¼	....	....	....	1½	....	1	....
Highbridge	20c	....	20c	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	20c	15c	15c	....	20c	15c	15c	....
Independence	2.45	1.80	2.15	1.10	3	2.30	2.90	2.35
Julia	3.60	3.05	2.95	2.55	3.10	2½	5	4½
Justice	5¼	4.15	4.20	3.60	4.10	3.60	3½	3.35
Jackson	4	....	3¾	....	4	3½	4½	4¼
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	4.30	4	4½	3.90	5½	4	5¼	4.45
Kossuth	15c	....	20c	10c	25c	20c	25c	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	1	75c	1.30	95c	1.15	1	1.05	80c
Lady Wash	1.70	1½	1.40	1.15	1½	1⅛	1.35	1.15
Leopard	1.60	1.20	1.40	1	1.15	1	1.20	1
Leviathan	55c	40c	40c	30c	40c	30c	45c	25c
Leeds	75c	....	75c	....	75c	70c	75c	....
Lee	....	....	....	....	....	....	....	....
May Belle	40c	....	30c	....	....	....	....	....
Modoc	1	....	1	....	1	90c	1	....
Manhattan	2¾	2½	2½	2	2½	2	2	1¾
Martin White	6	6¼	6	5¼	4	3½	4	3
McClinton	1.30	1	1⅛	1	1.10	1	1	70c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	25¾	21	24¾	20¼	33¾	21½	32¼	27
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	....	....
North Con Virginia	9¾	9	9¼	9	9¼	9	9	....
New York	60c	40c	50c	40c	40c	35c	90c	75c
Northern Belle	4.95	4¾	4.40	4.15	4.40	4	4.40	4
New Coso	....	....	....	....	....	....	....	....
Navajo	50c	40c	40c	35c	30c	....	35c	25c
Occidental	1	90c	90c	80c	1.05	90c	2	1
Ophir	36½	30¼	32⅛	29¼	36¼	30½	37	35
Oriental	15c	10c	45c	10c	50c	25c	70c	35c
Overman	9¼	8¼	9¼	8	10¾	8¼	9½	9
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	2¾	....	....	....
Phil Sheridan	....	....	45c	....	80c	35c	70c	50c
Potosi	4.95	4.15	4½	4.05	5⅝	4.05	5⅝	4.60
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	4	3	4	3.90	3¾	2½	3¾	3
Richer	75c	50c	55c	50c	45c	25c	50c	30c
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	75c	55c
Savage	14	11½	12	10¼	13¾	10¾	13¼	12¼
Seg Belcher	....	....	....	....	....	....	25	23
Sierra Nevada	42	31½	40⅛	31½	51½	37	45¼	40½
Silver Hill	1.60	1¼	1½	1⅛	1.40	1½	1½	1¼
Silver King	7¼	6¼	6¾	6½	6⅝	6	6	5½
Silver Prize	25c	20c	20c	....	20c	....	20c	....
Succor	15c	10c	15c	....	....	....	....	....
Summit	2.35	1.40	2.05	1¾	1.90	1½	2	1.65
Scorpion	1.80	1½	1.90	1½	3	1.95	2.50	2
Solid Silver	30c	20c	25c	....	....	....	....	....
South Bodie	30c	15c	25c	15c	20c	15c	20c	15c
South Standard	20c	15c	20c	15c	20c	....	15c	....
Star	60c	45c	....	....	55c	50c	50c	40c
St. Louis	....	....	....	....	....	....	....	....
Syndicate	7	5	6	5¼	6¾	6	6	5¼
Tioga Con	4½	3½	4	3.10	4¼	3.10	4.05	3.90
Tiptop	90c	75c	1	75c	1.10	95c	1.05	95c
Trojan	10c	5c	10c	5c	25c	5c	30c	5c
Union Con	37	29	35	26¼	57	27¼	53	45
Utah	17½	13½	16¾	14	20	14¾	19⅞	13
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.40	1⅛	1.40	1.05	2	1	2.05	1.65
Wells-Fargo	....	....	....	....	20c	15c	20c	10c
Woodville	50c	40c	50c	35c	50c	45c	60c	40c
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	15	12½	16½	14¼	19¾	15¾	18½	16⅝

Sales at S. F. Stock Exchange.

Friday A. M., Aug. 8.
830 Alta...6⅞
50 Alpha...24½
790 Andes...1.20@1.30
310 Best & Belcher...18½@18¼
735 Bullion...6⅞@7
270 Belcher...4.65@4.55
220 Benton...4.10@4.05
1350 California...5¼
1360 Con Virginia...5⅝@5¼
550 Chollar...7¼@7
20 Crown Point...4.80
1285 Con Imperial...1.55@1½
175 Challenge...2.60
20 Confidence...12¾@12
155 Caledonia...2.30@2¼
650 C Dorado...1.95
210 Exchequer...6⅝@6⅞
1440 Flowery...80@90c
350 Gould & Curry...10@10½
345 Hale & Nor...14@13⅞
255 Justice...3½@3.40
1895 Julia...4.90@5
70 Kentuck...5¼@5
380 Lady Bryan...1
150 Leviathan...25c
250 Lady Wash...1.30@1.35
1030 Mexican...30¾@30¼
1400 Mackey...1.45@1.60
1000 New York...80c@1
1115 N Bonanza...1.80@1.90
825 Ophir...35¼@36
100 Occidental...1@1.10
320 Potosi...5⅜@5⅛
1250 Phil Sheridan...70@60c
305 Savage...13¼@13
10 Seg Belcher...23
695 Sierra Nevada...45¼@44½
300 Silver Hill...1.30@1¼
315 Scorpion...2.40@2½
300 Senator...20c
800 Trojan...5c
320 Utah...19@19¼
680 Union Con...52½@53
250 Woodville...50c
1200 Wells-Fargo...15@20c
1150 Ward...2@2.05
265 Yellow Jacket...18½@18

AFTERNOON SESSION.
1860 Argenta...1¼@1.10
100 Albion...15c
250 Adenda...50c
1120 Belmont...70@75c
300 Bechtel...1.60@1½
995 Belle Isle...3.70@3.60
745 Bodie...11¾@11¼
250 Belvidere...95c
80 Bulwer...9¼@9¾
360 Black Hawk...1½@1.60
260 Booker...1.20@1
470 Champion...50@45c
950 Crœsus...25c
100 C Pacific...6¾
400 Caledonia (B H)...2
395 Dudley...1½
100 Defiance...85@80c
100 Eureka Con...14½
1025 Gila...1.35@1.40
905 Grand Prize...4@3.90
900 Goodshaw...25c
20 Glory...1.15
300 Golden Terra...14
400 Giant & O A...6
180 Hussey...15c
875 Independence...2¾@2.90
125 Jupiter...2¼@2.45
920 Leopard...1.05@1
400 Manhattan...2
130 Modoc...1
100 McClinton...95c
1710 Mono...8½@8¾
235 Mammoth...11@10½
785 Martin White...4@3.95
120 Northern Belle...4
100 Navajo...25c
1000 N Belle Is...55c
150 Noonday...3.90
635 N Noonday...3.15@3¼
100 Oriental...35c
200 Orient...30c
1410 Paradise...2
700 Queen Bee...60c
200 Real Del Monte...2@1½
200 Red Cloud...50c
50 Rustlor...40c
100 Richer...50c
800 Silver Prize...20c
525 Summit...1.90@1¾
80 Syndicate...5¾@6
630 S Bodie...20@15c
100 S Standard...15c
350 S Bulwer...70@80c
100 Tuscarora...5c
400 Tioga Con...4@3.90
520 Tiptop...1.05@95c
50 University...40c
380 Vortex...55@65c

Saturday A. M., Aug. 9.
5 Alpha...24
345 Alta...6½@6⅞
460 Andes...1.10@1.05
170 Argenta...1.15@1.10
610 Adenda...50c
65 Best & Belcher...18@18¼
65 Belcher...4¼
660 Bullion...6⅝@6½
365 Benton...4.10@4.05
300 Belmont...75@80c
1675 Belle Isle...3.60@3.70
535 Bodie...11@11¼
100 Bechtel...1½
190 Bulwer...9¼
50 Black Hawk...1.55
400 Booker...1.20@1¼
135 California...5¼@5¼
320 Chollar...6¾@6¼
210 Con Virginia...5½@5
210 Crown Point...4¾@4.65
220 Con Imperial...1.45
120 Challenge...2¼
200 C P Ravine...25@20c
1350 C Dorado...1¾@1¼
450 Con Washoe...55c
100 Caledonia (BH)...2½
120 Exchequer...6½@6⅞
20 Eureka Con...14½
2370 Flowery...75@80c
665 Gould & Curry...9⅞@9¾
640 Gila...1.30@1¼
975 Grand Prize...4@3.90
140 Goodshaw...50c
70 H & Norcross...13½
140 Independence...2.90
505 Julia...4.30@4¼
330 Justice...3½@3.40
75 Jackson...4¼@4.30
250 Jupiter...2¼
30 Kentuck...4.90@5
100 Kossuth...25c
120 L Wash...1¼@1.20
440 L Bryan...1@80c
555 Leviathan...30c
450 Leopard...1.15@1
300 Lady Wash...1¼@1.30
1255 Mexican...27½@27
545 Mono...8¾
1250 Mackey...1.40@1½
10 Mt Diablo...4½
110 McClinton...90c
200 Modoc...1
400 M White...3.35@3¾
550 New York...90@75c
10 North Con Vir...9
1015 N Bonanza...1.65@1.55
50 Northern Belle...4
1200 N Belle Is...50c
300 Navajo...30c
50 Noonday...3.60
215 N Noonday...3¼@3.15
1115 Ophir...35½@35
50 Overman...9¼
100 Occidental...1
50 Oriental...40c
200 Orient...25c
150 Potosi...4¾
315 Phil Sheridan...50c
720 Paradise...1.95@2
300 Queen Bee...60@65c
35 Raymond & E...3½@3
50 Richer...50c
355 Scorpion...2.10@2
1300 S Utah...5c
975 Sierra Nevada...41@40¼
315 Savage...12⅝@12¼
50 Syndicato...6
710 S Bodie...20c
25 Summit...2
200 Star...50c
400 S Bulwer...85@80c
85 Tioga Con...3.95@4
200 Trojan...5c
175 Tuscarora...5@10c
275 Utah...13@13½
980 Union Con...45@46½
250 University...40c
50 Vortex...40c
85 Woodville...60c
675 Ward...1¾@1.70
100 Wales...5½
420 Yellow Jacket...17¾@17

Monday A. M., Aug. 11.
90 Alta...6¾
340 Andes...1.10
580 Bullion...6⅜@6½
310 Belcher...4¼
240 Best & Belcher...18¾@18¼
130 Benton...4.15
400 C Dorado...1½@1.35
260 California...5¼
200 Con Imperial...1.45
255 Crown Point...4.70@4.65
95 Caledonia...2.10@2.15
415 Con Virginia...5¼
100 Con Washoe...50c
60 Challenge...2¼
100 Chollar...6¼
300 Exchequer...6¼@6⅜
1720 Flowery...70@60c
460 Gould & Curry...10¾@10⅛
250 Hale & Nor...14@14¼
750 Julia...4¼@4.30
250 Justice...3.35@3.40
35 Kentuck...4½
50 Lady Bryan...90c
100 Leviathan...45c
445 Lady Wash...1.30
145 Mexican...29½@29
550 Mackey...1.45@1⅝
100 Mount View...2.60
690 N Bonanza...1.65@1.60
80 New York...80c
130 Occidental...1.30@1½
565 Ophir...35@35¼
20 Overman...9½
170 Potosi...4.60@4¾
110 Savage...12⅝@12¾
145 Silver Hill...1¾@1.70
440 Sierra Nevada...41½@42¾
905 S Utah...5@10c
50 Solid Silver...25c
200 Trojan...5c
780 Union Con...47½@49
60 Utah...18¾@18½
30 Woodville...50c
100 Ward...1.70@1.65
150 Yellow Jacket...16¾@17

AFTERNOON SESSION.
2115 Argenta...1.10@1
200 Albion...20c
20 Adenda...55c
500 B Chief...50c
250 Booker...1.20@1¼
1100 Belmont...80@90c
300 Black Hawk...1½
125 Belvidere...1.20@1¼
1570 Belle Isle...3.60@3¾
110 Bulwer...9¼
105 Bodie...11¼
125 Bechtel...1¼
600 Champion...45c
150 Caledonia (B H)...2½
50 Crœsus...25c
10 C Pacific...7
250 Dudley...1.45@1½
240 Eureka Con...14⅝@15
170 Golden Terra...14
470 Grand Prize...3.90@4
100 Goodshaw...55c
955 Gila...1.40@1½
1050 Giant & O A...6
100 Hussey...15c
200 Independence...2¾
10 Jackson...4¼
850 Leopard...1.15@1.10
290 M White...3½@3.65
250 Mammoth...10
260 Mono...8⅞@8¾
75 McClinton...75c
390 Modoc...1
200 Mt Diablo...4¼
770 Manhattan...2
70 Northern Belle...4.40
3400 N Belle Is...45@50c
1220 N Noonday...3@3¼
200 Navajo...35c
1570 Oriental...40@50c
1800 Orient...25@30c
1300 Paradise...1¾@1.85
400 Queen Bee...55c
600 Raymond & Ely...3½@3
600 Rough & Ready...75c
200 Real del Monte...2½
600 S Bodie...20c
505 Syndicate...6
55 Silver King...5½@6
350 S Bulwer...75@80c
150 Summit...1¾@1.65
120 Star...40c
200 Tuscarora...5c
490 Tioga Con...4.05@4
55 Tiptop...1
1295 University...40c
500 Vortex...70c

Tuesday A. M., Aug. 12.
145 Alta...6½@6⅞
50 Alpha...22½
250 Andes...1.05@1.10
20 Belcher...4¼
340 Bullion...6⅞@6¼
40 Best & Belcher...18¼@18⅜
140 Benton...4.05@4.10
400 Con Dorado...1½@1.45
360 California...5¼@5
300 Con Virginia...5⅛
205 Caledonia...2.10@2.15
55 Challenge...2.40@2½
70 Con Imperial...1.45@1½
20 Chollar...6⅞
100 C P Ravine...25c
30 Crown Point...4.60
80 Exchequer...6¼
1350 Flowery...65@60c
410 Gould & Curry...11¼@11½
200 H & Norcross...14⅜@14¼
220 Julia...4½@4.45
55 Justice...3.45@3.40
75 Kentuck...4⅜
150 Leviathan...40c
330 Lady Wash...1¼
360 L Bryan...90@95c
190 Mexican...30¾
1400 Mackey...1.45@1.60
15 North Con Vir...9
1030 N Bonanza...1.60@1.35
100 New York...75c
570 Occidental...1.65@2
270 Ophir...36¾@37
165 Overman...9¼@9
175 Potosi...4¾@4.80
95 Savage...13@12⅞
340 Silver Hill...1.60@1.55
415 Scorpion...2.60@2¼
150 Sierra Nevada...43@43½
1300 S Utah...5@10c
100 Trojan...5c
220 Utah...18¾@19¼
175 Union Con...47¾@48
300 Wells-Fargo...10c
80 Ward...1.70@1¾
200 Woodville...50c
40 Yellow Jacket...16⅞

AFTERNOON SESSION.
2635 Argenta...1.05@1
575 Albion...15c
200 Addenda...45c
1115 Belle Isle...3¼@3.40
1500 B Chief...50c
510 Booker...1.20@1⅛
700 Boston...1¼@1.15
210 Bulwer...9¼
1135 Bodie...10¼@10
160 Bechtel...1¼
395 Belmont...90@95c
205 Black Hawk...1.40@1.30
50 Belvidere...1.20
750 Champion...40c
400 Caledonia (B H)...2¼
40 C Pacific...7
100 Dudley...1.35
100 D Standard...50c
150 Defiance...80c
15 Eureka Con...14⅞
525 Grand Prize...3.95@4
100 Giant & O A...5
100 Golden Terra...13
650 Gila...1.40@1½
100 Goodshaw...50c
200 Hillside...1
260 Independence...2.65@2.70
200 Jupiter...2.20
5 Jackson...4½
50 Leeds...75c
2190 Leopard...1.10@1.20
375 Martin White...3¼
270 Mono...8@7⅞
100 Mt Diablo...4¼
150 Mammoth...9¼@9
150 McClinton...75@70c
900 Manhattan...2
420 Modoc...1
20 Northern Belle...4.40
600 Navajo...30c
290 Noonday...3½@3¼
1100 N Belle Is...40c
250 N Noouday...3
550 Orient...30@25c
3230 Oriental...60@50c
30 Paradise...1¾
350 Queen Bee...65@70c
200 Richer...30c
25 Raymond & Ely...3½
500 Rough & Ready...60c
1400 S Bulwer...70c
400 Silver Prize...20c
55 Syndicate...6
100 Summit...1¾
100 Star...45c
80 Silver King...5½@6
200 S Bodie...15c
30 Tioga...4@3.95
75 Tuscarora...10c
300 University...40c
350 Vortex...70c
100 Wales...5½

Wed'sday A. M., Aug. 13.
300 Alta...6¼@6⅞
405 Andes...1.05@1
539 Benton...4.05@4.10
185 Bullion...6½@6⅞
380 Belcher...4.15@4.10
10 Best & Belcher...18¼
100 Chollar...6¾
685 Con Virginia...5⅛@5¼
135 California...5¼
50 Confidence...11¼
110 Con Imperial...1.40@1.30
50 Crown Point...4¾
450 Con Washoe...55c
200 C P Ravine...25@30c
200 Con Dorado...1.40
75 Challenge...2.15@2½
75 Exchequer...6¼@6
600 Flowery...60c
580 Gould & Curry...11¼@11⅜
60 Hale & Nor...14¼
180 Julia...4.40
105 Justice...3½
25 Kentuck...4¼
270 Lady Bryan...90@95c
275 Leviathan...30c
290 Lady Wash...1.20@1.15
750 Mackey...1.45@1.40
285 Mexican...31¼@31½
630 N Bonanza...1.40@1.45
130 New York...75@80c
20 North Con Vir...9
100 Ophir...36¾
1495 Occidental...1¾@1.65
10 Overman...9½
30 Phil Sheridan...60c
100 Scorpion...2¼@2.20
55 Savage...12¾
150 Silver Hill...1.60
400 S Utah...5c
440 Sierra Nevada...44@43½
300 Trojan...5c
130 Union Con...49@49¼
80 Utah...19@19¼
1250 Wells Fargo...10c
100 Ward...1.80
200 Woodville...50c
120 Yellow Jacket...16⅞

AFTERNOON SESSION.
600 Addenda...50c
800 Argenta...1
1200 B Chief...60c
440 Booker...1
550 Boston...1.20@1¼
190 Black Hawk...1.35@1.30
170 Bulwer...9
450 Belvidere...90c@1
620 Bodie...11¼@11
655 Belle Isle...3¾@3.35
75 Bechtel...1.40
500 Belmont...90@95c
450 Champion...40c
50 Caledonia (B H)...2
300 Crœsus...20c
130 C Pacific...7
100 Day...30c
360 Dudley...1.60@1½
115 Eureka Con...15
125 Giant & O A...6
200 Goodshaw...45c
475 Grand Prize...3.95@4
110 Gila...1.30
480 Hillside...1
1050 Independence...2.55@2.35
50 Jupiter...2¼
800 Leopard...1.10@1.15
600 Martin White...3¾
580 Mammoth...7@8
925 Mono...8¾@8⅝
150 McClinton...95c@1
370 Modoc...1
70 Manhattan...1¾
135 Northern Belle...4@4¼
530 Navajo...25c
1600 N Belle Is...40@35c
70 Noonday...3½
705 Orient...25c
2750 Oriental...60@70c
200 Paradise...1.80
200 Queen Bee...70@65c
25 Real del Monte...2
500 Rough & Ready...55c
20 Raymond & E...3¾
900 S Bodie...15@20c
140 Star...45@40c
125 Syndicate...5¼@5⅜
175 S Bulwer...75@70c
75 Summit...1.70@1.65
475 Tioga Con...4@3.95
70 Wales...6

SALES OF LAST WEEK AND THIS COMPARED

Thursday A. M., Aug. 7.
590 Alta...6¾@6½
40 Alpha...24@24½
900 Andes...1¼@1.30
130 Best & Belcher...18@17½
535 Belcher...4.60@4.55
180 Bullion...6½@6⅞
180 Benton...4.35@4¼
75 California...5¼@5¼
145 Chollar...7
330 Con Virginia...5¼@5⅞
395 Crown Point...4¾@4.65
625 Con Imperial...1.45@1½
385 Caledonia...2.40
80 Challenge...2½
350 C Dorado...1¾
100 Daney...2½
275 Exchequer...6¼@6½
3200 Flowery...75@50c
670 Gould & Curry...9⅝@9½
340 Hale & Nor...13½@13¾
970 Justice...3.80@3.60
625 Julia...2.80@2.95
325 Kentuck...5@5¼
260 L Bryan...1@1.05
200 Leviathan...35c
350 Lady Wash...1¼@1.30
1000 Mexican...29½@28¾
1230 Mackey...1.35@1½
1845 New York...35@40c
150 N Con Vir...9¼
1410 N Bonanza...1.60@1¾
130 Ophir...33½@33¾
145 Overman...10@9¾
220 Occidental...1.05
260 Potosi...4¾@4.80
1820 Phil Sheridan...70@50c
660 Savage...12@11⅞
1545 Sierra Nevada...44@46½
555 Silver Hill...1¼@1.20
500 Senator...25c
490 Scorpion...2.40@2½
800 S Utah...5c
85 Utah...17½@18
815 Union Con...51½@53
640 Woodville...50c
2300 Wells-Fargo...50c
110 Ward...1.65@1.70
310 Yellow Jacket...17¼@17½

AFTERNOON SESSION.
1830 Argenta...1¼@1.20
350 Albion...15c
500 Addenda...50c
1000 B Chief...55c
125 Belvidere...90c
230 Booker...1¼@1.40
50 Black Hawk...1.60
550 Belle Isle...3¾@3.70
285 Bodie...11@10⅞
30 Bechtel...1¼
200 Belmont...90c@1
340 Champion...50@40c
200 Caledonia (B H)...2½
160 C Pacific...7@6⅞
600 Crœsus...25c
600 Day...15@10c
50 Dudley...1½
115 Eureka Con...14½
20 Glory...1.10
275 Grand Prize...3.90
520 Gila...1.30@1¼
350 Goodshaw...25c
20 Hillside...1.40
1720 Independence...2.40@2.45
45 Jackson...4¼
550 Leopard...1.05@1
45 Mammoth...11½
415 Mono...7@7¼
270 Martin White...3¾@3.95
300 McClinton...90c
50 Modoc...90c
105 Mt Diablo...4¼@4½
1200 N Belle Is...55@50c
5 N Noonday...3.10
475 Northern Belle...4
900 Orient...30c
1300 Oriental...40@35c
1510 Paradise...2
1400 Queen Bee...60@65c
75 Raymond & Ely...3½
50 Real del Monte...2½
250 Rustler...50c
200 Richer...35c
200 Red Cloud...50c
50 Star...50c
55 Silver King...6¼
545 S Bulwer...75@70c

Thursd'y A. M., Aug. 14.
25 Alpha...23
215 Alta...6⅞@6½
50 Andes...1.10
20 Belcher...4
140 B & Belcher...18¼@18½
425 Bullion...6½@6
900 Benton...4@4.05
155 Crown Point...4½@4.60
315 Chollar...6½
300 Con Imperial...1.45
60 Confidence...11¼
995 California...5¼@5
160 Con Virginia...5⅛
40 Challenge...2.40
275 Caledonia...2.05@2.10
360 Con Washoe...50c
500 C P Ravine...30c
550 Con Dorado...1½@1.40
345 Exchequer...6⅞@6¼
480 Flowery...60@55c
130 Gould & Curry...11⅜@11.05
325 Hale & Nor...14@13¾
255 Justice...3¾@3.40
225 Julia...4.35@4.40
70 Kentuck...4.45
140 Kossuth...25c
100 Lady Bryan...1.05
260 Mexican...32¼@32½
180 Mackey...1.30
110 North Con Vir...9
450 New York...75@80c
300 N Bonanza...1.40@1½
200 Ophir...36½
265 Overman...9½@9¼
595 Occidental...1.40@1.30
115 Potosi...4¾@4.80
330 Sierra Nevada...43@42½
680 Savage...12¾@13
5 Seg Belcher...25
465 Silver Hill...1.70@1¾
160 Scorpion...2.40@2.35
500 S Utah...5c
50 Trojan...30c
120 Utah...19½@19⅞
500 Union...50@51¼
100 Ward...1.80@1.85
100 Wells-Fargo...10c
160 Woodville...50@40c
100 Yellow Jacket...17@17¼

AFTERNOON SESSION.
910 Argenta...1
400 Addenda...50@45c
250 Albion...25@20c
970 Booker...1¼@1.10
400 Boston...1¼@1.30
700 B Chief...50@55c
100 Belmont...1
1880 Belle Isle...3¾@3.65
320 Bulwer...9
170 Bodio...11⅜@11⅞
100 Belvidere...1.10
220 Black Hawk...1.30
95 Bechtel...1¼
700 Champion...45@40c
90 Con Pacific...6⅞@6¾
100 Caledonia (B H)...2¼
300 Day...25c
265 Dudley...1½@1.40
100 D Standard...75c
105 Eureka Con...16@15½
50 Gila...1.30
220 Grand Prize...4
525 Goodshaw...40c
500 Golden Terra...13½@13
100 Giant & O A...5½
20 Hillside...1
830 Independence...2.60@2½
475 Jupiter...2.10@2
500 Leopard...1.05
50 Leeds...70c
15 Manhattan...1¾
400 Modoc...1.10
230 McClinton...1
350 Mono...9⅞@9½
505 Mammoth...7¼@7
170 M White...3
50 Northern Belle...4
1450 N Belle Is...45c
100 Noonday...3½
250 N Noonday...2⅞
3025 Oriental...75@65c
100 Orient...30c
350 Paradise...1.85@1.80
550 Queen Bee...65c
145 Raymond & E...3¾@4
550 Richer...30@25c
150 Rough & Ready...50c

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Con M Co	Nevada	10	1 00	Aug 7	Sept 11	Oct 1	Wm Willis	309 Montgomery st
Argonaut M & M Co	California	1	05	Aug 11	Sept 15	Oct 6	J L Fields	240 Montgomery st
Amazon Con M Co	Nevada	6	10	Mar 24	June 11	Aug 29	Jno Crockett	12 Cosmopolitan Hotel
Belcher S M Co	Nevada	19	1 00	July 21	Aug 26	Sept 16	Jno Crockett	203 Bush st
Belmont M Co	Nevada	21	30	July 1	Aug 7	Sept 2	J W Pew	310 Pine st
Belvidere M Co	California	4	25	July 9	Aug 11	Sept 6	C V Hubbard	203 Bush st
Booker Con G M Co	California	3	50	June 30	Aug 4	Aug 25	W H Lent	309 Montgomery st
Brilliant M Co	Nevada	4	10	July 18	Aug 18	Sept 3	H S Stone	419 California st
Bullion M Co	Nevada	10	1 50	July 9	Aug 13	Sept 3	J Gruss	418 California st
Champion M Co	Nevada		25	July 26	Aug 31	Sep 30	G C Hurlbut	525 Commercial st
Commonwealth Con M Co	Nevada	1	25	June 27	July 11	Aug 30	C A Morse	217 Sansome st
Eagle S M Co	Nevada	14	10	Aug 4	Sept 10	Sept 30	J E Byrne	533 Kearney st
Exchequer M Co	Nevada	14	1 50	July 9	Aug 15	Sept 5	J Gruss	418 California st
Flowery M Co	Nevada	2	25	Aug 6	Sept 10	Sept 30	W W Stetson	309 Montgomery st
Gold Deposit G & S M Co	California	1	25	July 25	Aug 28	Sept 16	J M Buffington	209 California st
Goodshaw M Co	California	4	25	July 9	Aug 23	Sept 30	V Feinhach	327 Pine st
Gould & Curry S M Co	Nevada	36	1 00	July 10	Aug 14	Sept 3	Alfred K Durbrow	309 Montg'y st
Julia Con M Co	Nevada	9	1 25	July 8	Aug 13	Sept 4	H A Charles	419 California st
Justice M Co	Nevada	—	1 00	———	Sept 11	Sept 30	R E Kelley	419 California st
Jupiter M Co	California	4	25	July 5	Aug 11	Sept 4	E C Masten	22 Nevada Block
K K Con M Co	Nevada	—	1 00	Aug 1	Sept 3	Oct 1	B B Minor	309 Montgomery st
Leviathan M Co	Nevada	9	25	Aug 6	Sept 9	Sept 30	F E Luty	330 Pine st
Manhattan S M Co	Nevada	13	1 00	July 16	Aug 21	Sept 12	Jno Crockett	203 Bush st
McCrackin Con M Co	Arizona	3	25	July 29	Aug 29	Sept 17	H Aug Whiting	211 Sansome st
Mexican G & S M Co	Nevada	7	2 00	July 11	Aug 14	Sept 4	C L McCoy	203 Bush st
North Bonanza M Co	Nevada	3	25	Aug 13	Sept 17	Oct 7	W W Stetson	309 Montgomery st
N Noonday M Co	California	2	25	June 5	July 14	Aug 18	G A Holden	310 Pine st
New York M Co	Nevada	19	40	July 8	Aug 9	Aug 29	D L Thomas	203 Bush st
Original Keystone S M Co	Nevada	2	25	July 28	Sept 1	Sept 28	F E Luty	330 Pine st
Real Del Monte M Co	Nevada	7	1 00	June 10	July 19	Sept 23	C V D Hubbard	203 Bush st
Savage M Co	Nevada	38	1 00	July 8	Aug 11	Aug 30	E B Holmes	309 Montgomery st
Silver Hill M Co	Nevada	7	50	July 10	Aug 14	Sept 4	W E Dean	203 Bush st
South Bodie G M Co	California	1	25	July 18	Aug 25	Sept 17	H Deas	309 Montgomery st
South Bulwer	California	4	15	July 16	Aug 20	Sept 12	Wm Stuart	320 Sansome st
Tellurium G & S M Co	California	19	10	Aug 1	Sept 1	Sept 24	J M Litchfield	415 Montgomery st
Trojan M Co	Nevada	11	25	July 14	Aug 18	Sept 8	David Wilder	328 Montgomery st
Tuscarora M & M Co	Nevada	4	10	Aug 2	Sept 6	Sept 30	M E Sperling	309 California st
Union Con S M Co	Nevada	14	2 00	July 31	Sept 4	Sept 23	J M Buffington	309 California st
Ward G & S M Co	Nevada	4	50	July 2	Aug 7	Aug 27	J Stadtfeldt, Jr	26 Haywards Build
William Penn	Nevada	5	05	July 12	Aug 13	Aug 30	O J Humphrey	328 Montgomery st
Yellow Jacket S M Co	Nevada	33	1 00	Aug 4	Sept 8	Oct 8	Mercer Otey	Gold Hill, Nevada

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Addenda G & S M Co	California	1	20	July 2	Aug 7	Aug 28	T H Dixon	238 Montgomery st
Armand G & S M Co	California	1	10	June 9	July 28	Aug 25	J L Fields	240 Montgomery st
Black Hawk G M Co	California	6	50	July 1	Aug 4	Aug 25	H A Charles	21 Haywards Build
Curtis Con M Co	Nevada	1	10	July 11	Aug 11	Aug 30	H S Stone	419 California st
Hartford S M Co	California	1	50	June 18	July 21	Aug 13	S Heringhi	422 Montgomery st
Harrington M Co	California	1	20	Aug 11	Sept 18	Oct 8	W W Bausman	426 California st
Mayflower Grav M Co	California	5	10	June 17	July 22	Aug 23	J Morizio	328 Montgomery st
Mono G M Co	California	4	50	June 21	July 28	Aug 18	W H Lent	309 Montgomery st
Occidental M Co	Nevada	5	50	Aug 11	Sept 15	Oct 6	A K Purhrow	309 Montgomery st
Oro M Co	California	2	05	———	Aug 4	Aug 23	Wm Stuart	320 Sansome st
Queen Bee M Co	California	4	10	July 10	Aug 30	Sept 2	T A White	113 Leidesdorff st
Rustler G M Co	California	1	10	June 30	Aug 4	Aug 18	A F Main	309 California st
San Pedro G & S M Co	California	2	05	July 29	Aug 29	Sept 15	T A White	113 Leidesdorff st
Seg Europa M Co	Nevada	1	25	Apr 4	July 31	Aug 18	R B Noyes	240 Montgomery st
South Comstock M Co	Nevada	5	25	Jan 13	———	Aug 26	J M Buffington	311 California st
Sherwood Con M Co	Nevada	1	25	July 12	Aug 12	Aug 30	H S Stone	419 California st
Swansea M Co	California	1	10	June 14	Aug 4	Aug 25	F N Delaney	315 California st
Richer M Co	California	3	25	July 30	Sept 3	Sept 28	W H Lent	309 Montgomery st
Wide Awake M & P Co	Arizona	7	02	June 23	Aug 1	Sept 1	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Addenda G & S M Co	California	T H Dixon	238 Montgomery st	Annual	Sept 4
Alta S M Co	Nevada	Wm H Watson	302 Montgomery st	Annual	Aug 21
Caledonia S M Co	Nevada	W Wegener	414 California st	Annual	Aug 20
Comstock G & S M Co	Nevada	J M Buffington	309 California st	Annual	Aug 18
Crœsus G & S M Co		E Hestris	328 Montgomery st	Annual	Aug 18
Independence M Co	Nevada	Jno E Dixon	327 Pine st	Annual	Aug 18
Lucky Rocky G M Co	———	Chas Healy	Merchants Exchange	Annual	Aug 16
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	Annual	Aug 1
Meadow Valley M Co	Nevada	T W Colburn	414 California st	Annual	Aug 28
Mount Hood M Co	———	W W Bransman	409 California st	Annual	Aug 21
Rocky Point M Co	California	T L Bibbins	314 Bush st	Annual	Aug 18
S Comstock Con S M Co	Nevada	J M Buffington	309 California st	Annual	Aug 18
Sabine M Co	———	W W Bransman	409 California st	Annual	Aug 21
Swiss M Co	———	A Sarboro	521 Washington st	Annual	Aug 22
South Comstock G & S M Co	Nevada	J M Buffington	309 California st	Annual	Aug 18
Star M Co	Nevada	Wm Stuart	302 Sansome st	Annual	Aug 25
South Comstock Con S M Co	Nevada	J M Buffington	309 California st	Annual	Aug 18

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Argenta M Co	Nevada	J E Dixon	Stock Exchange	20	July 25
Belle Isle M Co	Nevada	John E Dixon	Stock Exchange	50	Aug 5
Bodie Con M Co	California	W H Lent	Nevada Block	1 00	Aug 1
California M Co	Nevada	C P Gordon	23 Nevada Block	50	Aug 17
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	50	Aug 16
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	1 00	July 21
Independence M Co	Nevada	John E Dixon	Stock Exchange	25	Aug 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	July 26
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	30	July 28
Montezuma M & M Co	———	J T McGeoghegan	318 Pine st	25	Aug 12
Standard Con M Co	California	Wm Willis	309 Montgomery st	50	Aug 12

200 S Standard	10c	325 Silver Prize	20c
150 S Belle	15c	130 Syndicate	.5½
340 Summit	2	75 Summit	1.80@1½
560 Syndicate	.6@5½	950 S Belle	15c
580 Tioga Con	4.10@1	100 Star	45c
100 Tuscarora	5c	325 Tuscarora	10@10c
180 Tiptop	1	610 Tioga Con	4
450 University	40c	120 Tiptop	1
2835 Vortex	55@60c	250 Vortex	65c
155 Wales	¾	80 Wales	6½

Pacific Board—Latest Sales.

Wednesday A.M., Aug. 13.

60 Bullion	.4	10 Alta	6.65
110 Best & Belcher	18½@18¾	120 Belcher	4.10@4.05
40 Benton	.4	200 Bullion	.6¼
130 Con Imperial	1.45	60 Benton	4.05@4½
100 Caledonia	.2½	250 Con Imperial	1.40
100 California	.5	30 Confidence	.11½
20 Chollar	.6½	30 Con Virginia	.5½@5.20
220 Con Virginia	.5.10@5½	40 Gould & Curry	.11½@11¾
120 Crown Point	.4.65@4.7c	50 Hale & Nor	.14
150 Flowery	.65c	200 Hussey	.25c
110 Gould & Curry	.11½@11¾	110 Julia	.4.35@4.40
10 Hale & Nor	.14½	480 Lady Wash	.1.15@1½
200 Julia	.4.40@4½	100 Lady Bryan	.95c
50 Justice	.3½	60 Mexican	.31½@32½
50 Kentuck	.4	50 M White	.3½
100 Lady Bryan	.1	100 N Standard	.2.35
80 Mexican	.31½@31½	120 N Bonanza	.1.40
50 N Bonanza	.1½	60 Ophir	.36½@36½
100 Ophir	.36½@36½	600 S Utah	.6c
120 Potosi	.4.90	400 Trojan	.5c
180 Savage	.12½@12¾	200 Uncle Sam	.21@22
60 S Nevada	.42½@42½	20 Union Con	.47½@50
10 Utah	.19	10 Utah	.19½
70 Yellow Jacket	.16½@17	50 Ward	.1.80
AFTERNOON SESSION.		1100 Wells-Fargo	.9c@10c
100 Andes	.1	80 Yellow Jacket	.16½@16¾

California Board—Latest Sales.

Wednesday A.M., Aug. 13.

30 Alpha	.22½@22¾	AFTERNOON SESSION.	
30 Alta	.6¾	30 Alpha	.23
1000 Atlantic	.45c	40 Alta	.6¾
50 Belcher	.4.20@4½	100 Ætna (A)	.5c
30 Best & Belcher	.18½@18¾	100 Ætna (N)	.10
50 Bullion	.6¼@6½	200 Belcher	.4.15
60 California	.5@5½	50 Best & Belcher	.18½@18¾
30 Con Virginia	.5½	30 Bullion	.6¼
200 Con Imperial	.1.45	50 California	.5½
55 Crown Point	.4.60@4.55	30 Con Virginia	.5½
50 Chollar	.6½	210 Con Imperial	.1.40
100 Challenge	.2.40	40 Crown Point	.4.60
130 Caledonia	.2.15@2.10	30 Chollar	.6½
200 Central	.55c@60c	30 Challenge	.2.40
600 Coso Con	.5@2c	35 Caledonia	.2.10
100 Dayton	.5c	200 Central	.65c@55c
50 Exchequer	.6½@6¾	100 Coso Con	.5@4c
50 Gould & Curry	.11½@11¾	100 Cor Washoe	.35c
70 Hale & Nor	.14½@14¾	20 Exchequer	.6¾
50 Julia	.4.40@4.35	300 Enterprise	.11@1.20
150 Justice	.3½@3.55	125 Goodshaw	.50c
125 Lady Wash	.1½	40 Gould & Curry	.11½@11¾
40 Mexican	.31½@31¾	200 Golden Chariot	.5c
100 Mint	.11c	40 Hale & Nor	.14½
500 North Carson	.2c	30 Julia	.4½
500 N Union	.45c	30 Justice	.3½
200 N Sierra Nevada	.7c	30 Mexican	.31½
50 Ophir	.36½@36½	200 Mint	.11c
45 Potosi	.4.85	100 Newark	.12c
40 Savage	.13@13½	20 Ophir	.36½
30 Sierra Nevada	.4½	40 Potosi	.4.15
200 Silver Prize	.20c	20 Sierra Nevada	.43½@43¾
120 Silver Hill	.1.65@1.60	30 Savage	.12½
200 S Utah	.6c	200 Trojan	.3@4c
100 Trojan	.5c	30 Union Con	.49½
20 Union Con	.48½@48¾	100 Woodville	.47c
		30 Yellow Jacket	.16½

The Mining Share Market.

It would please us to be able to say some cheering things of the mining share market, which, truth to say, has for the past week or two evinced signs of greater strength and activity. The past would, in fact, have been a pretty lively week in stock circles but for the happening of one of those untoward events that so frequently occur in this department of business, turning up often when least welcome and least expected. A "horse" has suddenly made its appearance on the 2300 level of the Union Con., causing that stock a slight set-back. As to the size of the brute nothing is known. It may prove only a colt or an equine of full growth and large dimensions. While the Hump-Backed Tyrant might on one occasion have found a horse worth more to him than his kingdom, our Comstock magnates could at times well afford to give a pretty good sized kingdom to get rid of the animal.

Despite this obstruction in a place so undesirable and at a time so inopportune, the ore prospects in this mine are far from desperate.

With a somewhat more lively market, prices have fluctuated but little, nothing of an exciting kind having occurred during the week. Quotations since last week remain, in fact, without material change, a condition of things that may ho expected to hold till new and important ore developments are made in some significant quarter. Everybody, even the best informed manipulators, seem to be just now in that state of doubt that disinclines to operations, one way or the other. Those who have shares are disposed to hold them, while those who have none are willing to let them alone, this apathy being increased at present by the refusal of certain managers to admit visitors into the mines of Nevada, as required by the statute of that State, a policy alike shortsighted and unjust. It is, however, due the superintendents of the north end mines to state that the results obtained from running the diamond drills have of late been freely given to the public, who are therefore supposed to be as well advised in the premises as the superintendents themselves. At the very close of the week an effort at concentrating north end shares, from Ophir to Sierra Nevada, inclusive, was noticeable. Mammoth declined sharply, falling to $7, the reason for which failed to transpire. Among other outside stocks the Bodies were well sustained; the leading Tuscaroras active, hut not strong, most others remaining about where they stood the week before.

A SPECIAL from Calcutta says that cholera is still raging among the troops and natives in Candahar, and is spreading toward Serat.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

TELLURIUM MINE. *Dispatch*, Aug. 9: The proprietors of the Tellurium mine have made preparations for sinking the shaft 300 ft deeper. The hoisting works, just finished, are complete in every particular, having ample capacity for sinking 1,500 ft if necessary. The shaft at present is down 240 ft, at which point they have a ledge of good quartz, about 9 ft in width, and the indications are very favorable.

CONRY MINE. Work has been recommenced on this mine. A 40-stamp mill is being erected. The company intend to give direct employment to about 250 men, most of whom will be underground miners. Four shafts will be sunk on the vein, and prosecuted with the utmost speed and skill. The rock of this mine assays well, but the gold is so fine that the most improved mining aparatus is required to prevent a very large proportion of it from going to waste with the muddy water.

THE KENNEDY.—This mine, which has been lying idle for some time, will be started up again in a short time, to be thoroughly developed, by Eastern capitalists.

BUTTE.

BUENA VISTA.—*Mercury*, Aug. 8: A large ledge has been struck in this mine. Samples of the ore assayed $250 per ton. The matter is decomposed quartz. Parties conversant with the property inform us that there are thousands of tons of the decomposed quartz, the ledge being one of the largest ever discovered in northern California.

CALAVERAS.

ITEMS.—*Citizen*, Aug. 9: Whittaker & Co. are engaged in prospecting their gravel claim in the vicinity of Vallecito and from what we learn will make it pay. Hans Christian, while working in his claim on Snake gulch in the vicinity of Vallecito last week, found a nugget of gold worth $70. Martine's claim and John Arrata's claim are being worked, but with what result is not known, as they cannot clean up until water can be secured when the rains come

EL DORADO.

GLENDOWER.—*Democrat*, Aug. 9: At a depth of 60 ft this mine has a 7½ inch ledge, with well-defined slate foot and hanging walls, and a beautiful soft "gouge" of fully six inches. The walls are as smooth as glass. The trend of the ledge is from the northwest to the southeast. Drifts have been run in both directions from the 00 level, which have established the fact that the "pay chute" has a length of about 240 ft. The ore in this chute will average at least $35 per ton, and its location is very favorable for large extraction of ore at small expense.

INYO.

MONOCK.—*Independent*, Aug. 9: South drift, 300-ft point, run 11 ft, drift from winze, 11 ft; 800 drift, 19 ft; crosscut to connection drift, 1000-ft point, 30 ft. Upraise from drift, 1100-ft point, raised 16 ft. Total length of south drift, 300-ft point, 130 ft. Drift from winze, 54 ft; drift, 800-ft point, 94 ft; crosscut from connection drift, 75 ft. Total hight of upraise, 1100-ft point, 35 ft. Still carrying a fine face of ore in drift from winze, 300-ft point; have 100 tons of ore in sight at present, showing a good prospect for a continuance. The drift at 800-ft point is looking very favorable for ore at this time.

KEARSARGE.—At about 800 ft from the mouth of the tunnel a winze is being sunk to further develop the extensive body of ore exposed in top and bottom, and for about 60 ft in length in the tunnel near that point. This ore body for about 20 ft in length, as shown in the roof of the tunnel, is from 12 to 28 inches in width The tunnel at this point is about 500 ft from the surface. The country rock is granite, but for more than 100 ft in the crosscut no granite is found at all; instead there are innumerable clay seams, with more or less quartz and streaks of paying ore besides the larger body above mentioned, interspersed in trap rock. It is evident that the ledge or ledge matter is not less than 100 ft in width. The pitch is about 30° westward into the mountain, and no hanging wall proper has yet been found. From a point a few feet back from the winze a tunnel or crosscut is being run directly in line for the Cliff mine.

MONO.

PRESCOTT DISTRICT.—Bodie *News*, Aug. 7: The ledges are well defined and the ore produced from them running high in silver. The presence of base metal is apparent in all portions of the country, and is freely interspersed with pyrites of iron throughout the rock. The ledges crop out boldly, and are well defined as to character; but the real merit of the district has yet to be tested by practical work in the mill or furnace.

MONO.—A drift south on the last ore vein out has been started. The ledge is 4 ft wide, developing very richly as progress is made south. The main shaft has attained a depth of 474 ft.

SOUTH BULWER.—Work is being pushed ahead with vigor in the drifts on the 350 level, and the ledge is looking remarkably well. Winze No. 2 from this level has attained a depth of 40 ft, and the ledge in the bottom is 3 ft wide of good ore.

NORTH STANDARD.—Sinking and timbering the shaft is going on steadily, the bottom being still in the same favorable formation. Have cut through a small ledge about eight inches in width of good ore, assaying very high.

SUMMIT.—The north drift, 200 level, is now in 318 ft; progress since last report, 8 ft. The ledge is about 20 inches wide. The east crosscut from this drift has been extended since last report 12 ft; total length, 206 ft. The ground works better than heretofore. The north drift, 300 level, has been run during the week 18 ft; total length, 222 ft. The ledge is looking well, and is about 3 ft wide. The south drift, same level, is in 247 ft; progress for the week, 32 ft. The ledge is 3 ft wide.

SOUTH STANDARD.—The north drift from the 400 level is in 80 ft from the shaft, and the crosscut from the same 25 ft to the east. A vein 2½ ft in width was passed through in this drift of the same character as that followed in the drift from the shaft.

BROOKLYN CON.—The ledge is looking well. The west side and bottom of the shaft is in four ft of fine looking quartz, and no footwall has been reached as yet.

RED CLOUD CON.—The south drift on the Packard and Morton vein from this level is in 30 ft, and the north drift 15 ft. The ledge in both directions shows an improvement, the porphyry boulders occasionally found bedded in the ledge having disappeared, and decomposed quartz and clay taking their place. Fine prospects in coarse gold can be obtained anywhere in the face.

JUPITER.—The station for the 400 level has been finished, and crosscuts east and west commenced. Work will be at once resumed in the shaft. From the 250 level the winze on the Daly vein has attained a depth of 120 ft. The ledge in the bottom is 4 ft wide, of good ore.

TIOGA.—The shaft is now 50 ft below the 520 station, and making good headway. The Syndicate drift is in 300 ft north of the shaft. The drifts north and south on vein No. 3 are still being extended, and the ledge maintains its usual width. The west crosscut on this level is going somewhat slowly on account of bad air. The winze on the Yerington vein from the 320 level has attained a depth of 150 ft, the ledge continuing strong.

VORTEX.—The ledge in sinking continues about two ft in width of very good ore, showing spots of very rich quartz filled with free gold.

UNIVERSITY.—The shaft is now down 60 ft and well timbered the whole distance. In the bottom a ledge of fine-looking quartz is running, which predominates largely in silver.

SOUTH NOONDAY.—The north drift is now in 30 ft from the shaft, the vein being 2½ ft wide of very fair ore. The walls are well defined. The south drift is 27 ft long, in the face of which the ledge is three ft wide of good milling ore. In a short time the new shaft will be started at a point where the ledge will be cut at a depth of 300 ft from the surface.

BULWER.—The south drift, 380 level, is in 145 ft; progress since last report, 44 ft. The ledge is 2½ ft wide, and looking well. The winze on the Ralston ledge is down 18 ft, and the ledge is 3 ft wide, of very fine ore

MCCLINTOCK.—The work of sinking the new shaft is making fair progress. The ledge in the bottom is 2½ ft in width. Work in the old shaft is confined to crosscutting on the 500 level.

ITEMS.—Mammoth City *Herald*: We were shown some rock from Prescott district which assays over $8,000 a ton. News from Laurel district is of the most encouraging character. Superintendent John Gorman informs us that rich ore has been struck in the Ida May mine. Every mine now being worked shows a marked improvement each day. Lone Mountain district is situated about 110 miles southeast of Lake. Mr. Buchanan, who has just returned from there, reports having made five locations, the average assays of which were $118 64, one going as high as $288 44. A furnace will be erected in the course of two months.

STANDARD CON.—*Standard*, Aug. 11: The north drift from the east crosscut, 385 level (vertical shaft), is in 310 ft, without any noticeable change in the ledge. About three and one-half ft of ore is being taken out in running the drift. The ledge continues to look well in the stopes, varying from 5 to 15 ft in width. The winze from the 350 level, incline shaft, is now 60 ft in depth, the ledge in the bottom being seven ft wide of good ore. The upraise on this ledge is 68 ft above the level; the ledge is eight ft wide and looks well. In the different stopes of the mine the ledges are looking well. That in the West Standard is 10 ft wide, of good ore. In the south drift, 550 level, the ledge is eight ft wide, of good ore. In the Gildea stopes the ledge is three and one-half ft wide of good milling ore.

NEVADA.

GREAT BLOOMFIELD.—Nevada City *Herald*, Aug. 6: J. C. Broderick, a few days since, reached the bedrock in his mining claims at Little Grass Valley, northwest from Columbia hill and four miles due west from the Dorbec mine. This land has been used for agricultural purposes since the first settlement of the county, until a year or two since, when Mr. Broderick commenced to prospect for gold. Upon reaching the bedrock he found the gravel about four ft thick, and prospecting from 40 cents to $1.25 per pan.

WASHINGTON.—A Chinese company are working the bar opposite Washington, and are said to be making good wages. The whole bar has heretofore been drifted out by white men. Capt. Swain is driving a tunnel in the Bessie Miller quartz claim, working two shifts and making five or six ft per day. He expects to strike the load in a few days.

DEER CREEK.—A crushing of 25 tons of ore from the Bulldozer and New Constitution ledges (both owned by the same parties), situated on Deer creek, opposite Worrell's ranch, has just been made. It yielded $15 per ton in gold and sulphurets. It is the second crushing from the ledges, the first having paid $10.50 per ton, and shows that increased depth is adding to the quality of the ore.

ORIENTAL MINE.—At the Oriental Con., work on the new mill is progressing rapidly, and it will be ready to start up in about two weeks. It has been found necessary to discontinue work underground for a few days, on account of no room for ore. Prospects in the mine are very favorable, and as soon as the mill is running, a good record will be made.

ITEMS.—Thomas Brown, working on the Guscetti milk ranch in Willow valley, has struck a ledge from two to six inches thick, at a point a short distance north of the Tam ledge. The ore is said to be rich. The complete returns of the last crushing from the Live Yankee mine are just in. The ore yielded in free gold and sulphurets $54 per ton. A miner recently took a crushing of 15 tons from a ledge that runs into Chapman's ranch, and it paid him $40 a ton. He is now having another lot from the same place hauled to the mill, and it looks even better than the first. There is now between 30,000 and 40,000 tons of tailings on the Derbec dump, and competent judges believe it will pay from $1 to $3 per ton if any plan can be secured to wash it clean.

BUELOW MINE.—The lead of this mine is of good size and prospects finely. Last summer a shaft was sunk 150 ft deep, and from the shaft a drift was run 35 ft to the lead, but the water being bad, a tunnel was commenced to drain the mine, and it is expected to reach the lead in a few weeks. The mine is of quartz and is situated on the south side of the South Yuba river, nearly opposite French corral.

ITEMS.—*Transcript*, Aug. 5: R. S. Osburn & Co., of Emigrant Gap, are putting up works on the Blackhawk ledge, eight miles southeast of Washington, with the intention of testing the Robinson process of reducing ores. There is a large quantity of surface ore on the dump, and operations will commence on it immediately. An ore body has been tapped on the Blackhawk ledge. The ledge on the Comanche lead averages two and one-half ft in thickness and has two chutes of pay ore. A tunnel has been started on the old Union ledge which is now 30 ft down. The Nevada County Con., Alpha, Omega and Great Washington companies have commenced a combination tunnel on a level with the bedrock in the Omega mining and water company's ground.

SAN BERNARDINO.

ITEM.—A great deal of placer mining is now going on in the San Bernardino mountains, and much gold is being taken out in small quantities.

SANTA CLARA.

ITEMS.—James W. Corless, and several others, claim to have discovered a gold and silver-bearing ledge near the headwaters of Permanenta creek, in the Santa Cruz range. Locations have been made on 7,500 ft, and the necessary papers filed.

SIERRA.

ITEM.—*Messenger*, Aug. 9: Work in the Kenton mine, Sierra county, is progressing well. In upraise No. 1 from tunnel No. 2 is found a good grade of milling ore. There are large amounts of sulphurets that assay well, and they are being shipped. The mill is running steady night and day.

NEVADA.

WASHOE DISTRICT.

ALTA.—Gold Hill *News*, Aug. 14: Good headway is being made in sinking the incline, and the bottom is now 100 ft on the slope below the 1750 station. The only ore being extracted from the mine is in raising on the ore body from the 1450 to the 1350 level, and amounts to about 15 tons per day.

LADY BRYAN.—Running two drifts on the 750 level, one 20° east of south and the other 30° north of east, both starting from a point 150 ft north of the shaft. The north drift of the two is in fine vein material containing quartz and low-grade ore in bunches. The south drift is in porphyry and quartz. On the 000 level, the south drift 075 ft from the shaft came to a body of clay running directly toward the Comstock. To the south of this lay country rock. A crosscut was started west from a point 50 ft north of this clay wall, which is now in porphyry and low-grade quartz.

MEXICAN.—The joint Ophir winze on the south line, 2100 level, is down 46½ ft, and is making slow progress, on account of water. On the 2000 level the joint Union Con. winze on the north line has been sunk 12½ ft. The joint Ophir west crosscut on the south line is now in 30 ft, and is in the same character of hard, blasting porphyry that shows on the east side of the Hardy vein in the Ophir mine.

OPHIR.—The main incline is 159 ft below the 2300 station on the slope, the face in quartz. On the 2300 level the north drift is in 122 ft. Excavating for the tank and balance-bob stations progressing well. On the 2100 level the joint Mexican winze on the north line has been sunk and timbered 46½ ft. This work is making slow progress, on account of water. On the 2000 level the joint Mexican west crosscut is now 29 ft from the main north drift in hard, blasting porphyry. The work of extracting ore from the flardy vein continues, and the stopes are looking well.

UNION CON.—On the 1600 level the east drift to the Union shaft is in 185 ft from the main north drift. Work on the joint Mexican crosscut on the south line continues. A drill hole is being run due south into Union Con. ground from the Sierra Nevada 2300 incline station, which corresponds with the Union Con. 2400 level. The hole is being run to ascertain whether the ore body widens to the east in going south.

CALIFORNIA.—The Joint Con. Virginia west drift on the 850 level has attained a total length of 552 ft, and is still passing through hard porphyry, with some water in the face. Work on the California winze, 1900 level, has been suspended for the present. The excavations for the pump foundations at the 1850 station of the C and C shaft have been completed. A pump is being placed at the 2150 level.

CON. VIRGINIA.—On the 850 level the joint California west drift has been extended 27 ft; total, 552 ft. On the 1050 level, opening up and retimbering the southwest drift is making good progress. The north drift from crosscut No. 1, 1950 level, is in 72 ft, and is still in soft vein matter, showing some ore. Total length of east crosscut, 2150 level, 115 ft, the face in bird's-eye porphyry, showing some quartz.

JUSTICE.—The south drift on the 1550 level of the Alta (1050 level of the Justice) will reach the line to-day, and to-morrow will be taken up and carried on to open the 1050 level.

TROJAN.—The northeast drift, on the third level, which ran through quartz and porphyry, has been stopped and a crosscut started west, which is in fine-looking ground. The west workings above the second level have been discontinued. The upraise from No. 2 stopes is cutting quartz and low-grade ore.

UTAH.—Putting the plunger pumps into the incline. One is already in place and good progress is being made with the work. Connections with the rod and the V-bob are being made.

CON. IMPERIAL.—The north drift, 2000 level, is in 570 ft, and is nearing the joint Alpha winze. Connection will be made some time this week. The winze has been cleared of water and repairs on the 2400 level completed. Retimbering the burnt drift, 2135 level, is making good progress.

UNION SHAFT.—The shaft is down 02 ft below the Ophir 2000 level. On the 1000 level the west drift to connect with the Union Con. east drift is in 30 ft, and in very hard rock. The foundation pit for the large pumping engine will be finished this week.

LEVIATHAN.—The south lateral drift on the 750 level is making a pretty fair showing at present in low-grade ore, nearly half the face being in quartz assaying from $5 to $12 to the ton. The north lateral drift on the same level continues in hard ledge porphyry.

NEW YORK.—On the 1200 level a drift is being run north in the ledge and is following a likely-looking vein of low-grade ore.

ANDES.—The winze below the 400 level is down 50 ft, the bottom in fine, lively quartz. The crosscut east, 350 level, is looking better, there being quartz in the porphyry.

YELLOW JACKET.—The winze is 164 ft on the slope below the 2500 level. The southwest crosscut on the 2500 level is in 53 ft.

NIAGARA.—On the 500 level the two lateral drifts, north and south, continue in a very favorable formation of quartz and vein porphyry. Water gives no trouble.

MT. HOOD & VANCOUVER.—The drift on the 1400 level is now 430 ft in length, and has of late been encountering harder rock than formerly.

BELMONT DISTRICT.

BELMONT.—*Courier*, Aug. 2: The mine has greatly improved during the past week. A raise from the 300 level was advanced 29 ft since last report through fine ore. A drift has been started north from the raise to connect with long raise from the 500 level under this ore body, and when completed will commence stoping out the ore. The ore body south of shaft, above the 200 level, is looking splendid. They have a stope 20 ft long with pay ore from 20 to 30 inches in thickness. A raise is being run from level 50 ft north of this ore body, which is showing six inches of good ore.

CONVICT DISTRICT.

ITEM.—From the gold fields in Convict district we hear encouraging reports, says the Mammoth *Herald*. There are about 15 men at work. The deepest shaft is down about 18 ft. Sluices will be ready for business in two or three days. As far down as any company has yet gone, gold has been found.

INDIAN DISTRICT.

ITEMS.—The Czar and Viceroy, of the Sultan Hill company, are looking very promising indeed. The shaft of the former is down 115 ft, sinking into a very rich body of ore, which assays $171 per ton; the latter's shaft is down 138 ft, and has a vein 13 ft wide, the ore of which goes $74 to the ton. The Caliope, owned by Capt. Prescott and others, has a shaft 50 ft deep and ore that assays $222 per ton. The Illinois mine, owned in this city, is also a very promising piece of property, with an eight-ft ledge of silver and copper glance ore. The Tower mine, owned by William M. Lent, John F. Boyd, and others, is down 200 ft in rich black sulphurate ore. The owners have already taken out over $100,000 from that mine.

PARADISE DISTRICT.

ITEM.—*Silver State*, Aug. 7: Parties report great excitement at Willow point over a rich mine found on the east side of Paradise valley, about eight miles from Willow point. The discovery was made by George Hymer, and the ledge is said to be four ft wide and very rich.

ITEM.—*Silver State*, Aug. 12: New mines have been discovered in the Paradise range of mountains. Three ledges have so far been discovered, one of which carries carbonates containing a high percentage of lead and from $60 to $100 per ton in silver. This lead has been opened several ft by a cut, and shows six or eight ft of ore. Another lead, some three ft wide, contains chloride ores which assay up to $1,007 per ton in silver, while the third ledge is of unknown width and contains considerable white quartz and galena. These ledges were discovered not over a week ago and it is impossible to form a correct estimate of their value or extent.

PIOCHE DISTRICT.

ITEMS.—Eureka *Sentinel*, Aug. 7: Another valuable strike has been made in one of the Wyandotte company's mines at Tem Pahute. It is very rich chloride ore, and the indications are such that it will prove to be a very large body. This strike was made eight days ago. Mining matters at Hiko are improving and everything there is moving smoothly along. The working force in the mines has been considerably increased of late, and it is thought that the mill will be in thorough repair and the stamps crushing ore about the first of next month.

PRESCOTT DISTRICT.

RUSH MINE.—Esmeralda *Herald*, Aug. 2: The Rush mine, owned by Messrs. Hamilton, Watkins & Randolph, shows assays from $106 to $377 per ton. The ledge is about four ft wide and well defined. The Snowdrift is looking well. The Dome company is taking out plenty of good ore. The ledge has been tapped in the Webfoot at the depth of 40 ft, and they have run through about 30 ft of ore that assays well. The Bulger is a gold ledge that assays well in gold but no silver. The camp contains about 150 men.

TYBO DISTRICT.

ITEMS.—Eureka *Sentinel*, Aug. 5: Charles Streitberger showed us the result of two assays of the Oliver Twist ore. The first-class went $320.00, and the second-class $42.40. The ore carried a few dollars in gold to the ton. The

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ledges not far distant. Following up Virginia creek we reach the Mono region. The work all about here can only be carried on five months in the year, the balance being so cold as to prevent progress.

About Mono diggings, the oldest in the county, there are found rich ledges of quartz, though generally of small size. When mined, the ore is worked by an arastra, which, according to the miners belief, save more gold than a mill. Mono diggings at first created a great excitement, and many an acre of granite bedrock was laid bare in a short time. Soon, however, the great Aurora excitement came on, and the whole section was utterly deserted—tools, claims and cabins were left, and the interest has never since revived; partly because, in the absence of the miners, the water was all monopolized and put under a single head, now held to be sold by the inch at a high figure.

Contrary to the general opinion on the paragenesis of gold, we find in the upper Mono gulch, ledges of quartz well defined but small, with both foot and hanging wall of solid granite. How deep these ledges run is not known, they having been mined but 20 feet at present, but thus far the quantity and quality increases. The metal itself can be detected in about every third specimen, and all consists of free-milling ore. Yes, gold is where we find it, be it in granite or slate. There has been extensive prospecting done in Mono gulch, and as it continues, I think, with many others, that there are valuable ledges to be found, from which proceeded the placer gold which paid the early miners so well. Otherwise than the mining, there is nothing attractive about this region, it being a dry, desolate ground, sparely clothed with sage brush and studded with great granite boulders which loom up 30 and sometimes 50 feet, often beautifully marked with bright colored masses.

South of Mono diggings we encounter Mill creek, on which are found a few "washes," where the ground pays for sluicing. Following up the creek to the mountains we came to the best prospecting region I saw while out. Here, the ore is base, rebellious because of the presence of sulphurets; but the ledges are large, well defined and, owing to the steepness of the mountains, they can be traced easily without digging. Much of the land is claimed, but more than half of the claims could be obtained for little or nothing, and by proper management, some very profitable investments could doubtless be made.

From here we took up our homeward march, and nothing further of interest occurred. Throughout our trip, we encountered many prospectors; some hopeful, others despondent, and from the general outlook I should judge that the country was being rapidly opened up. There surely are many valuable opportunities for men willing to take a moderate risk in a new country. J. H. Wheeler.

Strychnine.—In Ceylon and several districts of India grows a moderate sized tree, with thick and shining leaves, and a short, crooked stem. In the fruit season it is readily recognized by its rich, orange-colored berries, about as large as golden pippins—the favorite fruit of many birds—within which are the flat, round seeds, not an inch in diameter, ash-gray in color, and covered with very minute silky hairs. The Germans fancy that they can discover a resemblance in them to crows' eyes, but the likeness to them is purely imaginary. The tree is the *strychnos nux vomica*, and the seed is the deadly poison nut. The latter was used as a medicine by the Hindoos, and its nature and properties were understood by Oriental doctors long before it was known to foreign nations. Dog-killer and fish-scale are two of its Arabic names. It is stated that at present the natives of Hindostan often take it for many months continuously, in much the same way as an opium eater eats opium. They commence with taking the eighth part of a nut a day, and gradually increase their allowance to an entire nut, which would be about 20 grains. If they eat it before or after food, no unpleasant effects are produced, but if they neglect these precautions, spasms are produced.

Diverting the Oxus River from its Present Course.—One of the numerous engineering problems which it has been left to this generation to solve, is the turning back, by Russian engineers, of the Oxus into its Caspian Sea channel, from which it was diverted into Lake Aral by Octai Khan, when besieging Khiva in 1235. Immediately after the Khiva expedition of 1873, a scientific survey was made of the Lower Oxus, and most of the experts were of opinion that the progressive diminution of the river by artificial irrigation, and the evaporation consequent upon the destruction of the forests which shielded it from the sun, had made its volume insufficient to traverse an extra distance of nearly 5,000 miles encumbered with deep sand. It is now stated, however, that the experiment is actually being made; and the Lower Syr-Daria being only 12 inches deep in summer, the Russians may well do their utmost for the Oxus, as their only possible waterway into the heart of Central Asia.

A Buffalo paper says that nearly the entire right of way for an oil pipe line from the Bradford oil district to that city has been secured, and is led to infer that nearly all the desired capital has been subscribed. The surveys it says have already been quietly made.

Notes on the Fishes of the Pacific Coast.—No. 2.

Scorpis californiensis, Steindachner.—This is another of those species which only occur in our markets on rare occasions. The individuals described by Dr. Steindachner, were collected at San Diego, and, as a very large proportion of the fish fauna of that locality is different from that of San Francisco, it was with a great deal of interest and a little surprise that I found, upon comparison of the single specimen of this little fish with Dr. Steindachner's description of *Scorpis californiensis*, that they agreed in every particular. The example mentioned, now in our museum, came from Tomales bay, in a box of Embiotocidæ or viviparous perch, and the dealer who saved it for me stated that he sometimes received two or three in a similar way from the same locality. I have since procured a larger specimen.

Scorpis californiensis belongs to the family of *Squamipennes*, so named from the growth of scales upon the surfaces of the vertical fins. All *Squamipennes* are high, thin fishes, with ctenoid scales; and a single dorsal having the spinous portion well developed.

Only two species of the family have been described from this coast, and one of these, *Ephippus zonatus*, Girard, I have not yet seen.

The fish now in our collection is 7.6 inches in total length, and 2½ inches in greatest depth of body; but the species attains a length of 10 or 11 inches.

It may be recognized at once, by its bluish gray color; rather small ctenoid scales; small mouth with an even row of comparatively large teeth, backed by several rows of smaller teeth, and by the covering of small scales which invests all the soft rays of the dorsal and anal, the caudal, and much of the exterior of the pectoral and ventral fins.

Porichthys porosissimus, Silver-spengled toadfish; *Porichthys notatus*, Girard.—The name here given to this fish embodies one of its most noticeable peculiarities, namely, the rows of pores upon the lower parts of the body, each shining like a silver spangle. It can scarcely be entitled a food fish, yet it is eaten in considerable numbers by the Chinese, and is occasionally brought to market. The ugly head, dark-colored scaleless body, and altogether bizarre appearance of this fish are probably the principal reason for its rejection by white people. Doubtless the Chinese are as good judges of fish as we are, but their ideas of beauty possibly differ.

In the month of June, or thereabouts, this fish comes to the shore, and fixes its residence under rocks, to the lower side of which it attaches its ova, which are as large as a pea. In this position I once found numerous examples in Tomales bay, and was at first much surprised to find myself greeted, when I endeavored to pick them up, not only with a dig from the sharp spines upon the gill covers, but with a most emphatic grunt of dissatisfaction.

This fish must therefore be added to the number of those which produce sounds. It attains a length of about 16 inches.

Ophidium Taylori.—The first mention of this fish may be found in the Pac. Rail. Rep., vol. X., p. 133, where Girard gives a few of its specific characters, and states that it inhabits the sands of Monterey beach.

During the months of March and April a few individuals have on several occasions been brought to the markets of San Francisco, and inquiry elicited the information that they were found at Bolinas bay, to the north of San Francisco, and that they lived among the sands and rocks. Some of those obtained came from Monterey or its neighborhood.

Ophidium Taylori is a long, eel-like fish, with the dorsal and anal fins formed entirely of soft rays and continuous with the caudal; the pectoral fins placed in the lower half of the hight of the body; the ventrals represented by two long bifid filaments placed far forwards on the under side of the bone of the tongue; the mouth rather small, and the teeth of small size upon the jaws, vomer and palatines. It is the only known representative on this coast of the Ophidiidæ, as restricted by Gill, a family characterized by gill-membranes continuous beneath the throat, continuous dorsal, anal and caudal fins, and an anguilliform, or eel-like body.

The other characters given above are common to all species of the genus *Ophidium*, but there are other peculiarities which distinguish this fish from other known species. These are supplied by the arrangement of the teeth, the proportions of various parts to each other, the coloration and the structure of the air-bladder. In color, it is light olivaceous above, fading out on the sides into the whitish of the under parts. Along the sides are several rows of roundish, dark spots, the two or three uppermost continued almost or quite the length of the body, but most of them dying out in the pectoral region. The head has similar spots.

The air-bladder, or swim-bladder, is a comparative large ovate organ, ending posteriorly in a narrower fleshy portion, pierced by a small aperture, and having in front two saucer-shaped bony plates attached to the second vertebra. In the center of the external convex face of each of these a muscle is inserted, probably for the purpose of drawing forward the front of the air-bladder. Although this fish is not sufficiently common to be of much value as an article of food, it is excellent eating. It has no popular name.

Leurhynnis paucidens, nov. gen. and sp.—As I find no mention of this fish in the works of Gunther, Gill or Steindachner, I presume that it is new, although it is just possible that some naturalist with whose writings I am unacquainted may have described it. It belongs to the small family *Lycodidæ*, and, in common with most of its relations, has an elongate eel-like body, small scales; continuous vertical fins (that is, the dorsal, anal and caudal united) composed of soft rays, and contracted branchial apertures, the gill-membrane not uniting under the throat, but attached to a broad intervening space or isthmus. The genus *Leurhynnis* is further characterized by the absence of teeth upon the palatines or vomer; the presence of small ventrals placed in advance of the pectorals; and the insertion of the pectorals in the lower half of the hight of the body. The head is large and both deeper and thicker than any part of the body; the jaws very long; the teeth small and slender, in a single row except in the front of the mandible, where there are three or four rows; and the color olivaceous, the scales lighter than the skin, and the vertical fins margined with black. During the months intervening between September and the middle of March this species certainly did not occur in our markets, but from the latter date to May it occurred tolerably often, but seldom in sufficient abundance to make it of any account as an article of food, a circumstance which is to be regretted, as it is of excellent flavor, superior, in my opinion at least, to many of the flat fishes. The largest specimen I have yet seen measured only 10½ inches in length, and I presume that it does not attain much larger dimensions. The Lycodoid fishes have considerable resemblance in general appearance to the Blennies, but may at once be distinguished from them by the absence of spines in the dorsal fin. This is the only species of the family found on our coast.

Quassilabia (?) cypho.—I give this name, provisionally, to a very singular member of the family *Catostomidæ* or fresh-water Suckers. The only specimen I have seen was brought from the Colorado river, at the junction of the Gila, and was brought to the California Academy of Sciences some two years ago. Its chief external peculiarity, or at least that which is most likely to be noticed by an ordinary observer, is the singular hump upon the back, between the head and the dorsal fin. This hump is not a mere development of fat, as is the case with the less abruptly-rising humps of some kinds of fishes whose backs become more elevated with age, but is supported by a system of greatly-developed interspinous bones, the first of which is very large and strong, formed of a thick central pillar with a broad lamina in front and a broader behind. The under surface of the central pillar has a double articulating surface for attachment to the first vertebre. There are also other peculiarities in the structure of the anterior portion of the vertebral column. Another external character of importance is the structure of the lips. In the family generally the mouth is upon the under surface of the head, and is furnished with thick papillose lips, one upper or anterior; the other lower, or posterior. In one species, the *Quassilabia lacera* of Jordan and Brayton, known also as the Hare-lip and Split-mouth Sucker, the lower lip is small, and divided into two quite distinct lobes, while the border of the under jaw is cased with a rather hard, horny plate. These characters are also possessed by the fish under review, which may perhaps be considered as the Western representation of the Hare-lip Sucker of the rivers of the Eastern States. It differs, however, from that species in the considerable development of the operculum or gill-cover, which in *Q. lacera* is very small, as well as in the skeletal peculiarities above mentioned, so that probably a new genus must be created for it. Shortly after this example was presented, I read before this academy a few notes upon it, but they have been mislaid, and I now bring this species again into notice, partly because I have written a full description of it for publication in the Eastern States, where scientific research is considered of more importance than it is here; but chiefly in order to have an opportunity to ask any individual who may pay a visit to its habitat to bring us, if possible, a few more specimens.

Sphyrna malleus (the Hammer-head Shark).—A large species of Hammer-head Shark is found along the coast of Lower California, and presents characters in many respects similar to the *Sphyrna* (Zygæna) *malleus* of Shaw, combined with others which approach *Sphyrna tudes*, Cuv. A specimen six feet one and five-eighths inches long is in this museum, to which it was presented recently by Messrs. Fisher and Chapman, while a much larger individual, apparently about 14 feet long, is in the Zoographicon building at Woodward's gardens. The long hammer-like lobes into which the front part of the head is laterally prolonged are nearly one-third longer than their width at the extremity where the eye is situated; and the nostrils, which are in the front of the lobes, close to the eyes, have (in our specimen) a groove running from each of them along about half the distance to the center line of the head. The front margin of the head is sinuous, but not curved. In *Sphyrna malleus* the lobes of the head are normally shorter than in our fish, and the groove from the nostrils is longer, running along nearly the whole of the front part of the head. In *Sphyrna tudes* the front of the head is much curved, yet the ends of the lobes are distinct from the front; and the grooves from the nostrils run along more than the half of the front of the head. You will thus see that our hammer-head differs from either, yet I do not venture to call it a distinct species; on the contrary, I have reason to doubt whether one of the characters usually considered specific and constant, namely, the length of the groove from the nostrils, is to be depended upon. The large individual at Woodward's gardens has these grooves very short indeed, not extending one-fourth of the distance from the nostril to the center of the head. Now, as our specimen and Woodward's were caught near the same place (Mazatlan); as they are alike in the teeth, the fins, the outline of the head and of its lobes; yet differ in the nasal groove, I submit that the shortness of the grooves is the effect of age, and that this character is therefore not specific. The individual in Woodward's gardens is the largest hammer-head I have ever seen in a museum, and I much regret that I was not allowed the opportunity of taking correct measurements of it.

Note.—Full descriptions of *Ophidium Taylori*, *Leurynnis paucidens*, *Chitonotus megacephalus*, and the new Catostomoid will appear in Prof. Jordan's "Icthyology of the United States."

A "Review of the Pleuronectidæ of the Pacific Coast," containing full descriptions of all the species, new and old, known to occur on the Pacific coast of the United States, was forwarded to the Smithsonian Institution about two months ago for publication in the "Proceedings of the United States National Museum." The proof of this "Review" has already been revised.

[Concluded.]

Silver Mining in Chihuahua, Mexico.

For centuries Chihuahua has ranked among the most famous of the Mexican States for the production of silver; but from various causes, until very recently, the energies of Americans have not been directed to that rich region.

But thanks to American enterprise, that land is destined soon to pour into the United States the wealth which a century ago, glutted the avarice of the haughty Spaniard.

There are now in the State of Chihuahua at work, and organized for work, no less than six American companies, owning and controlling the richest end best of the mining property in the State. A brief mention of these is all that will be attempted at this time. The Santa Eulalie mining company owns the mines of Santa Eulalia, 16 miles from the city of Chihuahua.

Under the rule of Spain, these mines paid to the Catholic church a tax on $111,000,000.

They are, without doubt, the most extensive deposit mines in the world. But for want of capital, they are still being worked by the ancient methods of the Mexicans. The company proposes to tunnel the mountain, build a railroad 12 miles to the forks of the Sacramento and Chihuahua rivers, and there establish large works for the reduction of the ores by methods. The Cusiquiriachic mines were purchased last fall by a company from San Francisco for the comparatively trifling sum of $500,000. These mines are 90 miles southwest from the city of Chihuahua. The records do not show their former wealth, but it is known to have been great. The veins are true fissures, containing at the depth of 600 feet solid metal, in some places 15 feet wide, averaging nearly $100 per ton. The ores are now being reduced by the lixiviation process with excellent results. The Batopilas mines, in the southwest part of the State, owned and operated by Wells, Fargo & Co., contain large deposits of native silver, and are enriching their owners. The records show that under Spanish rule these mines produced $400,000,000. The consolidated mines of Parral, owned by the Knotts company of Chicago, are situated in the city of Hidalgo or Parral. The records show that these mines have produced $60,000,000. They are true fissure veins, aggregating in length three-fourths of a mile, with a width of from 6 to 30 feet. The last six years working by the Mexicans yielded over $900,000, the ore averaging $81 per ton.

These mines have only been worked to a depth of a little more than 400 feet.

They own, in connection with these mines, at least 500,000 tons of cast-away ores, which average $20 per ton, much of it yielding $70 per ton.

For want of capital, these mines are still worked by the ancient methods of the Mexicans. But the company now has at the mines a large amount of modern machinery, and expects to secure sufficient capital to set it up and operate it on a large scale.

This company claims that it owns a larger body of good paying ore than any other one company in the world.

The Dry Mountain silver mining company, of Terre Haute, Ind., owns the mine La Luz, five miles west of Parral. This is one of the best mines in the district around Parral. It is a true fissure vein, as wide as nine feet, yielding from $20 to $100. For want of capital, this mine is also now worked only in the Mexican way. But the company propose to secure a good water-power which is accessible to them, and establish large works for the reduction of the ores. This company having no water to contend with, the cost of mining will be comparatively small. The Hidalgo mining and power company, of Chicago, owns the mine Las Gijas, in the Dry mountain, five miles west of Parral, which is celebrated for having at one time produced a large pocket of native silver.

This company proposes to establish works for the reduction of the cast-away ores of the Knotts company, and do a general custom business, also establish a foundry and machine shop in Parral.—*Real Estate and Mining Review.*

The Engineer.

Speed of Railway Traveling.—The various German governments and others, who are interested in the problems connected with railway development which are pressing for solution in Germany, have been collecting information on all points bearing on the subject. Among other things, a paper has been published showing the different rates of velocity at which railway trains travel in different countries. According to this table, the swiftest runs are in England, between London and Dover, London and York, London and Hastings, where the average reaches 80 kilometers (50 miles) an hour. In Belgium some trains travel as fast as 67 kilometers (nearly 42 miles). The express trains from Paris to Bordeaux, Orleans line, averages 63 kilometers (39½ miles); the same speed is attained by the express trains between Berlin and Cologne. Between Bologna and Brindisi the average maximum is 50 kilometers (nearly 31¼ miles). The average Austrian express speed is from 40 to 48 kilometers (25 to 30 miles). On the Moscow and St. Petersburg line one travels at the rate of 43 kilometers (nearly 27 miles) per hour; the same speed is observed in Switzerland between Geneva and Lausanne, and between Zurich and Romanshorn. But on the other Swiss lines one must be content with a slower pace. Thus, from Zurich to Basel the highest speed is 38 kilometers, and between Basel and Borne 34—nay, between Soleure and Burgdorf the moderate gait of 25 kilometers, or a little more than 15½ miles an hour, is observed. There are in Switzerland no purely "through" trains which do not stop at intervening stations.

The Draining of Lake Fucino.—One of the greatest engineering undertakings of the present century, well fitted to rank with many attempted in Holland, not even excepting the projected draining of the Zuyder Zee, is the successful accomplishment of works by which the Appenine lake has become a thing of the past, and some 35, 000 acres of the richest land recovered for cultivation. The labor of making the tunnel necessary for the task, and other works, has occupied nearly a quarter of a century, and Prince Torlonia has expended on the work more than ten millions of dollars. All the water has disappeared, except a small basin used to drain the surrounding district. The greatest length of the lake was formerly some 10 miles, and its breadth about seven, while the towns of Avezzano and Pescina are no longer in danger from the sudden rising of the water in this volcanic district. The idea of draining it is not a new one, and the remains of the aqueduct constructed under the reign of the Emperor Claudius were formerly shown to the traveler. This has been made use of in the present undertaking, and after the lapse of so many centuries the people of this Appenine district, some 2,200 feet above the level of the sea, are rejoicing over the completed work. Upon visiting the spot a few years hence it will be difficult to realize that those vine-clad hills were covered with water within so brief a period.

African Railway Project.—The project of carrying civilization into Africa seems to be gaining ground in the minds of Frenchmen. An interesting report is published in the *Journal Officiel* by M. de Freycinet, Minister of Public Works. It is addressed to the President of the Republic, and urges the necessity of appointing a commission to examine the question in all its details, and report as to the practical possibility of uniting Algeria and Senegal to Soudan by means of a railway. The Minister of Public Works points out that many of the regions of Central Africa are by no means so sterile as they have been represented to be. The Soudan is traversed by the Niger, a great river, the banks of which are studded with villages. The population of this province is estimated by some travelers at over a hundred thousand inhabitants. The soil resembles in many parts that of Europe, and all the elements necessary for foreign commerce appear to exist in a high degree. This region can be got at on either side by Algeria and Senegal, and the idea of uniting Africa to the Niger by a railway upwards of 2,000 kilometers in length, although a bold one, is by no means a chimerical conception.

Canal Communication Between the Caspian and Euxine.—In a recent issue of the Russian journal of the Ministry of Public Works, the project is discussed of a connection of the Caspian and Black seas by a system of canals, according to the designs of M. Daniloff, an eminent engineer. The proposed water-courses are to comprise a canal of 300 versts in length from the River Terek to the watershed of the Manitch, which links the Don with the Caspian; a canal of 320 versts from the mouth of the Katavs to enter the Volga near Astrachan; a third of 350 versts from the mouth of Katavs westwards through the valley of the Manitch to the Don; and finally, a branch from the canal to Serebriakoff on the Caspian. By means of another special branch to the Black sea, in the direction of the westerly portion of the Manitch, M. Daniloff proposes to provide a complete water thoroughfare between the Volga and the Don, the Black and Caspian seas.

Useful Information.

Joining Wire.—An improved method of joining fencing and other wire has been contrived by Mr. J. H. Nettleford, of Birmingham, by which a very secure junction is made, and the wire may be so prepared before it is supplied to commerce that the joining can be effected without the use of tools. The following is the manner in which the ends of the wire to be joined are prepared: Two or three inches of the end portion of the wire are first folded or doubled upon itself, this being effected round a peg or mandrel. A nearly elliptical hoop of about four times the diameter of the wire is thus formed, the extreme end of the folded portion of the wire being parallel with the straight portion of the wire, and separated therefrom by a distance equal to the diameter of the wire. The elliptical loop is bent into a plane, making a very obtuse angle with the parallel portions of the wire. In connecting together two ends of wire bent as described, they are brought together in such relative positions that the straight portions of the two wires lie parallel upon one another, each wire passing through the loop of the other wire. The parallel parts terminating the loops also lie parallel upon one another. By tightening the wires, the extreme end of each wire enters the loop of the other wire as the loops slide upon one another, and there is thus formed a junction somewhat resembling a sailor's knot, the parallel portions adjoining the loop of each wire being situated in the loop of the other wire. The junction thus formed is exceedingly strong, and the tighter the wires are stretched the more secure the junction becomes. This method of effecting a junction has the further advantage that the two portions of wire joined are in one of the same straight line. The loops at each of the ends to be joined are, by preference, made on the same side of the wire; they may, however, be made on opposite sides with nearly the same effect. In the latter case the two portions of the wire are not quite in the same line. Besides being applicable to the joining of fencing wire, the method we have described is also applicable to the joining of wires for various purposes, such, for example, as signal wires and telegraph wires.

How to Print Several Copies of a Letter. A new process, by M. Chardon, is as follows: Make a zinc tray about a quarter of an inch in depth, and pour into it a warm solution made as follows: Water, four ounces; sulphate of baryta, two and one-half ounces; sugar, one ounce; gelatine, one ounce; glycerine, six ounces. Write whatever is required to be printed upon a sheet of white paper, using instead of ordinary ink the aniline color known as "violet of methylaniline." As soon as the writing is pretty dry, lay it upon the gelatine surface and rub the back of the paper with the palm of the hand. The ink will be absorbed by the gelatinous product. All that is to be done in order to obtain a *fac simile* of the writing is to lay a sheet of paper upon the writing on the gelatine and rub the back with the hand. From 40 to 50 can thus be drawn off in a few minutes. We find that in warm weather, plates thus prepared remain too soft and adhesive to work satisfactorily. Better results are obtained when a larger proportion of barium sulphate—say three and one-half instead of two and one-half ounces—are used and the mixture is heated for an hour on the water-bath.—*Scientific American.*

Practical Hints.—There is this difference between a plumb line and a perpendicular line. The former is always a vertical line; while the latter is one at right angles to some other line or surface, and may be either vertical or horizontal, or at any angle with either. A knowledge of geometry is very essential to becoming a good mechanical draftsman. In making the scorification assays of gold and silver ores, the powdered ore if mixed and covered with about ten times its weight of pure granulated lead in a small dish of refractory clay (scorifier), and introduced into the muffle of a cupellation furnace. If the ore is at all basic a few fragments of anhydrous borax (borax glass) are added to the contents of the scorifier. As soon as the lead has melted the door of the muffle is opened and the scorification proceeds until the ring of slag closes over the lead button. The scorifier is then removed and poured into a smoked iron mold. If, after breaking away the slag, the button is found to be small enough, it is immediately cupelled; if not it must be returned to the scorifier and reduced in size by scorification. The cupellation is the same as with the crucible beads.

The Manufacture of Damascus Steel.—In a series of articles on mining and metallurgy at the Paris exhibition is promulgated the following interesting data on the method of making Damascus steel sword blades at Zlatoust, in the Ural. The pig iron used in making the latter is a spiegel, 8% of manganese, which is partly converted into puddled steel and partly refined. The cast-steel ingots of about five pounds weight are made from selected qualities of puddled steel, 61% of the crucible charge being hard, 23% medium steel, 10.37% refined pig iron, and 3.71% pure magnetic ore. The tilted bars are twice piled for shear-steel, a layer of sulphide of antimony being placed between the different bars. The final pile is made of four square bars, about one-eighth of an inch in the side.

To Remove Fusil Oil from Spirits.—According to the *Brennerei Zeitung*, a single agitation of spirit with the following compound will completely remove the fusil oil from potato brandy, and will leave the fluid perfectly clear: Sugar of milk, part 1; starch powder, parts 2; powdered albumen, parts 5. About 4 ounces of the powder is sufficient for a gallon of spirits. Another journal gives the following directions for a similar process: "The liquid is sweetened with crushed sugar and strained, and one ounce of pure starch, half an ounce of finely powdered prepared albumen, and half an ounce of milk-sugar are added to every two gallons. The whole is well shaken several times and then allowed to rest for 24 hours. It will now be found to be beautifully cleared without filtration."

Composition of Explosives.—A German chemical journal gives the following analysis of explosives used as substitutes for gunpowder: *Dioreine:* Nitrate of potash, 50%; nitrate of soda, 25%; sulphur, 12%; sawdust from hard wood, 13%. *Azotine:* Chile saltpeter, 69.05%; carbon, 15.23%; sulphur, 11.43%; petroleum, 4.29%. *Petralite:* Nitrate of potash, 64%; impregnated wood or charcoal, 30%; antimonium crudum, 6%. *Johnite:* Saltpeter, 75%; sulphur, 10%; lignite, 10%; picrate of soda, 3%; chlorate of potash, 2%. *Carboazotine:* Nitrate of potash, 61.04%; sulphate of iron, 0.73%; soot, 24.65%; sulphur, 13.58%.

To Remove Rust from Steel.—Steel which has rusted can be cleaned by brushing with a paste composed of one-half ounce cyanide potassium, one-half ounce castile soap, one ounce whiting, and water sufficient to form a paste. The steel should first be washed with a solution of one-half ounce cyanide potassium in two ounces water. To preserve steel from rusting, a good method is to paint it with melted caoutchouc, to which some oil has been added. The caoutchouc must be melted in a close vessel to prevent its burning, and should be frequently stirred. It is also said that dipping the steel in a solution of common soda (about one in four) will preserve it from rusting.

Fireproof Paper.—Fireproof paper may be made, according to the *Pharmaceutische Zeitung*, from a pulp consisting one part of vegetable fiber, two parts of asbestos, 1-10 part of borax, 1-5 part of alum. The ink is made from 85 parts of graphite, 0.8 part of copal varnish, 7.5 parts of copperas, 30 parts tincture of nutgalls, and a sufficient quantity of indigo carmine.

Polish for Walnut Wood.—Mix with two parts of good alcoholic shellac varnish one part of boiled linseed oil, shake well, and apply with a pad formed of woolen cloth. Rub the furniture briskly with a little of the mixture until the polish appears. This is probably as good as the more complicated polishes.

Good Health.

Nerve Stimulants.

Dr. Brunton has the following interesting and suggestive remarks on this subject in a recent article in the *Contemporary Review:*

There are two nerves, known as the "fifth pair," which are distributed to the skin of the head and to the mucous membrane of the eyes, nose and mouth. These nerves are closely connected with the heart and vessels, and by stimulating their branches the circulation may be greatly influenced, as in the case of fainting. It is a curious fact that people of all nations are accustomed, when in any difficulty, to stimulate one or another branch of the fifth nerve, and quicken their mental processes. Thus, some persons, when puzzled, scratch their heads, others rub their foreheads, and others stroke or pull their beards, thus stimulating the occipital, frontal or mental branches of these nerves. Many Germans, when thinking, have a habit of striking their fingers against their noses, and thus stimulating the nasal cutaneous branches; while in other countries some people stimulate the branches distributed to the mucous membrane of the nose by taking snuff.

The late Lord Derby, when translating Homer, was accustomed to eat brandied cherries. One man will eat figs while composing a leading article; another will suck chocolate creams; others will smoke cigarettes; and others sip brandy and water. By these means they stimulate the lingual and buccal branches of the fifth nerve, and thus reflexly excite their brains. Alcohol appears to excite the circulation through the brain reflexly from the mouth, and to stimulate the heart reflexly from the stomach, even before it is absorbed into the blood. Shortly after it has been swallowed, however, it is absorbed from the stomach, and passes with the blood to the heart, to the brain, and to the other parts of the nervous system, upon which it then begins to act directly. Under its influence the heart beats more quickly, the blood circulates more freely, and thus the functional power of the various organs in the body is increased, so that the brain may think more rapidly, the muscles act more powerfully, and the stomach digest more easily. But with this exception the effect of alcohol upon the nervous system may be described as one of progressive paralysis. The higher centers suffer first, and the judgment is the first quality to be impaired, and this becomes the more so as the effect of alcohol progresses, although the other faculties of the mind may remain not only undiminished by the direct action of the alcohol on the brain, but greatly increased by general excitement of the circulation. By and by, however, the other parts of the nervous system are successively weakened, the legs fail, and the person falls insensible. It is evident, then, that only the first stages of alcoholic action are at all beneficial, the later stages being as clearly injurious.

Nourishment in Typhoid Fever—Unsound Logic.—Dr. Samuel Peters (*N. Y. Medical Record*), in a paper on typhoid fever, refers to the importance of supporting the strength by nutriment, and adds: "I once had a case, a lady of large frame and plenty of adipose tissue, who drank every day four quarts, by measure, of pure milk. I was frequently inquired of as to the probability of her recovery. I answered that she *could not die*, because she was able to appropriate so much nourishment. She recovered," etc. Now it so happened that the present writer also had a case of typhoid fever, a young lady of good constitution, who was able to relish and appropriate an ample quantity of the same nourishment, and who died notwithstanding. No serious symptoms occurred during the first two weeks, and no active medication was required or employed. In the third week nervous and cerebral disturbances set in, with the result mentioned. Therefore, a patient *can die* in typhoid fever, even when well nourished. Dr. Peters is not the only medical writer who has made hasty and illogical conclusions.—*Pacific Medical and Surgical Journal.*

Hygienic Effects of Sea and Mountain Air.—This is the time of year when many families leave their homes in the city for the more invigorating mountain or seashore air, anxious to go where they may derive the most health-giving benefit, and still are undecided which way they will go, to the mountains or seaside. To such persons the following extract from a recent work by Dr. C. Alberto, a celebrated Italian physician, may be an aid in helping them to decide: "The marine air," says the learned doctor, "produces the same benefit as that of the mountain, but each has a different *modus efficiendi;* the former acts more forcibly and energetically on the constitution which retains some robustness and internal resources to profit by it, while the second acts more gently, with slower efficacy, being thereby more suitable to the weaker and less excitable organizations. From this important distinction, the conscientious physician, who takes the safety of his patient much to heart, ought to be able to discriminate whether the alpine or the marine atmosphere is the better suited to the case he has before him."

To Attain Long Life.—He who strives after a long and pleasant term of life must seek to attain continual equanimity, and carefully to avoid everything which too violently taxes his feelings. Nothing more quickly consumes the vigor of life than the violence of the emotions of the mind. We know that anxiety and care can destroy the healthiest body; we know that fright and fear, yes, excess of joy, become deadly. They who are naturally cool and of a quiet turn of mind, upon whom nothing can make too powerful an impression, who are not wont to be excited either by great sorrow or great joy, have the best chance of living long and happy after their manner. Preserve, therefore, under all circumstances, a composure of mind which no happiness, no misfortune, can too much disturb. Love nothing too violently; hate nothing too passionately; fear nothing too strongly.—*Sanitarian.*

For Weak Eyes.—An exchange gives the following recipe: "Bathe the eyes in soft water that is sufficiently impregnated with spirits of camphor to be discernible to the smell—a teaspoonful of spirits of camphor to a tumbler of water. For inflamed eyes use milk and camphor, adding a little more of the camphor than above." An excellent lotion, commended by a leading Boston occulist, is a solution of ten grains of borax in the officinal "camphor water" (*not* the "tincture of camphor"). This is safe and beneficial as an application in any slight weakness or inflammation of the eyes due to exposure or weariness. In serious cases professional advice should always be taken.

Saccharated Extracts.—C. S. Hallberg, Ph. G., in the Chicago *Pharmacist*, proposes to substitute sugar of milk as a preservative vehicle for the active principles of vegetable medicines, instead of alcohol and other substances. The advantages claimed over ordinary extracts are, that the proposed extracts do not ferment, are unchanged chemically by the contents of the stomach, are always in a convenient form, and always of uniform strength. His process is as follows: "Exhaust 16 troy ounces of a crude drug; evaporate to a solid extract; carefully desiccate and mix with sufficient sugar of milk to bring the whole when powdered to 16 troy ounces."

Potato Disease and Diphtheria.—It seems now fairly established, says the *Chemical Review*, that *Botrytis infestans*, the parasite which occasions the potato disease, is the same which gives rise to diphtheria.

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The Week.

The past week, like most of its predecessors of late, has been unmarked by local events of a noteworthy kind. The leading interests and industries of the coast are being fairly prospered, our people, in an almost entire exemption from the diseases that have afflicted and the disasters that have fallen upon communities elsewhere, finding cause for special gratitude. The two great harvests, the gathering of the golden metal and the gathering of the golden grain, have gone on apace, bringing to the husbandman, and even to the gleaners in each of these broad realms of industry, ample and satisfying rewards. But while so escaping the malific agencies mentioned, we have not been spared some causes for turmoil and excitement. The political "dog days" are upon us—the partisan Sirius rages. Almost every sovereign in the land is excited, the office-seeking portion of them being wholly rabid. With three and a half parties in the field on State matters and an indefinite number of municipal tickets extant, the body politic wriggles and squirms like a basket of eels, every one seeking to get on top. All minor events are obscured by the overshadowing interest taken in public affairs, to say nothing of the still greater interest that centers in private emolument, and so patriotism prevails and all will be hurry-skurry till election is over and this scramble for official position ended.

A LETTER from Yokohama says: The Prime Minister has issued a decree that from July 1st export duties will be abolished on cotton and silk manufactures, silk and cotton mixtures, made dresses, precious stones, lacquered wares, bronze, manufactured bamboo, manufactured copper, paper fans and umbrellas.

Further About the Gold-Bearing Sulphurets.

The growing attention now being paid to the collection and treatment of the auriferous sulphurets so abundant on this coast, points clearly to a great advance of our mining interests in that direction. We made mention last week of a new method lately adopted for releasing and gathering this material from the tailings of the seam diggings that have accumulated at certain localities in El Dorado county. It appears that these sulphurets are not confined to the thin seams and ribbons of decomposed quartz that constitute this class of diggings, but that they pervade also the slates which inclose and interstratify these quartz seams, forming often the country rock on one or both sides. To such an extent have the slates at some points in the neighborhood alluded to been enriched from this source that the plan of breaking them down and crushing them after the manner of the quartz tailings has been adopted to advantage, some free gold in addition to the sulphurets being obtained by this method.

It has long been known that the slate rock which forms one of the walls of the mother lode of California is more or less auriferous for a considerable distance from the main vein. Much of this slate has in times past been broken out and crushed with profit for the free gold it contained. With the sulphurets, which abound in this rock, nothing so far as we know has ever been done. Under the impression that they were worthless or of too little value to justify any attempts being made at working them, they have probably been suffered to go to waste altogether. If, however, the sulphurets that occur in the slates of El Dorado county contain enough gold to warrant their being saved and reduced, it is fair to infer that those found in this rock elsewhere along the main gold belt will do the same. Should this turn out to be the case, then the field for practical gold mining in this State will at once be much enlarged, as this band of auriferous slate lying adjacent to the mother lode, being sometimes on one side and sometimes on the other, is very extensive. At some points in Tuolumne county it has already been worked for a breadth of 40 or 50 feet, the entire mass of slate removed having been crushed with profit. On the Harris claim, forming a section of the mother lode, and situated two miles northwest of Jamestown, an immense pit, worked as an open quarry, has been excavated in the slate, that here forms the east country. The contents of this pit were milled and yielded well, work having been discontinued only when the hole became so deep that the broken down slate could no longer be removed with a horse and cart, so little enterprise had the millmen and miners at that day.

A new mill having lately been erected on the Harris mine to take the place of the old one long since burnt down, this property is now being worked with excellent returns. Crushings since the resumption of operations have been confined to the quartz, but with these new revelations in regard to the probable value of the sulphurets in the accompanying slate belt, there is little doubt but they also will soon be attacked and that in the handling of them highly satisfactory results will be reached.

An experience not unlike this of the Harris company has been had by other parties mining elsewhere along the great quartz range that here crosses the country. In Amador county a lateral formation composed either wholly of slate or slate mixed with quartz, makes a feature of several important mines situated on the main lode between Jackson and Plymouth. In some instances this outlying material has been handled with benefit, notably so in the case of the Potosi, now known as the California mine. Besides its intrinsic value this sulphuret-bearing slate has come to be accepted as indicative of fertility in the grounds to which it forms an adjunct.

While these auriferous sulphurets are so abundant in the refuse of the quartz mills and seam diggings as well as in the rock in place, they are likely to find in the hydraulic washings of this State a very prolific source. In estimating the value of the debris or tailings that have in such quantity accumulated in certain portions of the mines, not much account has heretofore been made of the sulphurets they contain. In an elaborate report on the hydraulic tailings resting in Bear river and its tributaries, made by one of our leading mining engineers a few years since, this material was alluded to as constituting an item of no inconsiderable value. But so little was the worth of these sulphurets then appreciated that they were wholly ignored in calculating the returns likely to attend a rehandling of this debris, it being generally supposed that this engineer had attached an undue importance to these sulphurets. Recent examinations, however, show that, so far from this having been the case, their value was probably underrated on that occasion. If they carry anything like the amount of gold that recent tests indicate they will form a new and consequential factor in dealing with the problem of further utilizing these tailings, which are known to contain almost everywhere a large percentage of sulphurets. In view of their great abundance and probable value the best means and methods for concentrating and reducing these sulphurets should be at once ascertained, an end that opens a large and inviting field to our own metallurgists and inventors. Both of these objects can be accomplished by the processes and appliances now in use. But these, considering the necessities likely to arise, will hardly prove adequate, being comparatively slow and costly, and therein adapted to the treatment of small quantities of rich concentrations only. There will be a call in the near future for apparatus capable of handling extensive lots of low-grade material, and the inventor who shall fully meet it will receive his reward. We are evidently on the eve of taking a step forward in the business of gold mining in California, but its success will depend in some measure upon the aid received from our skilled metallurgists and mechanical inventors; we must be able to gather these sulphurets closely and treat them with economy.

The Human Species.

In the light of modern discoveries, the problem of the origin of the human race is constantly receiving fresh accessions to the Mosaic account, notwithstanding the researches of so learned a man as Agassiz, and the delectable theories of Darwin. In order to explain the perplexities that arise from the strange anomalies that exist in the human family, Agassiz selected several centers of creation of man, giving to each of the great races a particular creative point, otherwise the Mosaic account was accepted so far as it threw any light upon the results of modern researches. Looking upon the different races as possessing nothing in common with each other, and the analogies ending with the general appearances and structure of the physical system, perhaps the theory could be maintained from a strictly material point of view. The views of Agassiz in this regard were not entirely satisfactory to him, and up to the time of his death he had not yet fully determined upon a proper solution of the problem.

It is not necessary to anathematize Darwinism, although, the descent of man from apes is revolting to all our intellectual ideas. The theory is plausible enough leaving out the immortality of the soul as maintained by equally wise philosophers, but has reference in our opinion more to the analogies existing in the animal propensities of the human race. Indeed, it is not necessary to go beyond the present time to find the intellectual faculties wholly obliterated by brutal instincts, all the more agravated in man by as much as he is supposed to be superior to animals. There is nothing to fear from this doctrine gaining universal acceptance. It is hardly reasonable to suppose that it will become a rule of conduct in our social relations. Carried out, however, to its fullest extent, the evil consequences must be apparent to all in the total destruction of human responsibility to any superior power.

M. De Quatrefages, Professor of Anthropology in the Museum of Natural History at Paris, has lately given to the public many interesting points concerning this subject. He maintains the unity of the human species, and arrives at the conclusion that all men of whatever color belong to the same species, and that there is but one species of man. While considering some points in Darwinism—as the struggle for existence and selection—perfectly unassailable, Prof. De Quatrefages refuses to admit the descent of man from apes. The Professor does not anathematize those who maintain that man is so descended, nor does he greatly blame their boldness. For himself, however, he declares as the result of all his studies that he does not know the origin of the human species, and he believes the solution of the question is at present impossible, and will, perhaps, always be so.

As to the antiquity of the human race, he considers that discoveries warrant the conclusion that man has survived two great geological epochs, having lived during the glacial period by protecting himself with fire, and even suggests that it is possible that hereafter traces of man may yet be found further back still. He is unwilling to accept the theory of Agassiz of several centers of creation, maintaining that no facts have yet been discovered which authorize us to place the cradle of the human race elsewhere than in Asia.

He claims that the globe was peopled by migrations by land and sea, and in regard to primitive man follows the opinion of the French naturalist, M. de Salles, who attributes red hair to the earliest men. It is also argued that the ancestors of the negro were a race of a much lighter color. The Professor does not concern himself with the distinction to be established between mind and matter, and the mysterious link which unites the physical with the intellectual being, but only with the investigation of the several manifestations resulting from this connection, and with the recognition of the distinctive marks of the groups which he is studying. Avoiding this Scylla and Charybdis upon which so many philosophical theories have been and are still being wrecked, the domain of the spiritual has no place with the material, except, perhaps, as a directive power, the power of spirit over matter. In the near future, perhaps, an objective point may be reached by human investigation, which will more fully explain the relations of spirit and matter.

SALMON are very abundant in the Mokelumne river this season, and the Indians are catching large quantities on the riffles.

Our Manufacturing and Mechanical Industries.

As a glance over the physical geography of California discloses a considerable extent of arid deserts, so does an inspection of our industrial chart reveal a like expanse of barren wastes, upon which no useful pursuit has yet taken root—places where no planting has yet been done, and where it was supposed nothing would grow. At first it was generally believed that these great Saharas, lying off in the southeasterly part of the State, were utterly worthless and hopelessly barren. But they are not—the soil in spots is tolerably good, the only drawback being want of water. Then, too, it is found that certain of the native products here are not without economic value. The Yucca cactus, the emblem of sterility, and about the only tree that grows on these deserts, contains a fibrous substance that makes good paper, and which is likely to be largely utilized for that purpose. And now it appears that the soil and the climate are so well adapted to the growth of the date-bearing palm that the culture of that valuable tree will soon be undertaken there. Other discoveries of like kind will probably be made; and after a while the waters of the Colorado will, perhaps, be turned on these *mauvaises terres*, so fertilizing them that we will have to eliminate them as such from the map altogether.

In like manner have our industrial wastes been invaded, and, through judicious planting and careful culture, been much curtailed of their originally large proportions. Little by little have we encroached upon these barren and forbidding places, inducing with much care a tender plant to take root here and another there, until this manufacturing and mechanical husbandry has been placed on a firm foundation and reached respectable dimensions. To us who have been acquainted with the history of these pursuits from the first, they possess a special interest. Looking back to their small beginnings, ten, twenty, and, in some cases, as much as thirty years ago, and contemplating their struggles since, it is with satisfaction and even pride that we hail their final triumph, as evidenced in the exhibit now being made of their products at the Mechanics' fair in this city. It is within our recollection when every one of these pioneer pursuits was inaugurated on this coast. We well remember the words of good cheer and much encouragement, not unmixed with misgivings, that were extended to them at the start.

Earliest of all was the foundry and machine business, commenced in this city just twenty-nine years ago the present month. In the Mechanics' pavilion can be seen now the first piece of iron ever cast in California. It formed part of the machinery of the steamer *McKimm*, and was made at the Union Iron Works in August, 1850, two pairs of blacksmiths' bellows having been used to raise the blast. Of such humble origin was the establishment that still bearing this name outranks now all works of this kind west of the Rocky Mountains. In good time other mechanical enterprises were set on foot, all operated at first with equally imperfect appliances, and on an equally limited scale. Among the earliest articles of home manufacture were wire, cordage, soap and candles, woolen goods, earthen and wooden ware, boots and shoes, saddles and harness, paper, glass, etc.

While the most of the industries we have essayed to domesticate have turned out well, a few have proved failures; some so much so that they have been wholly abandoned, and will not be likely to undergo early resuscitation. Tea culture is not, and turpentine gathering is not. The soap plant as a fiber-yielding bulb has disappointed expectation; cotton growing languishes; the flow of our oil wells fails to keep out the Pennsylvania petroleum; and the shuttles of Lyons still keep going despite our silk growers' best efforts. Tobacco comes to us from abroad, notwithstanding the Culp method of cure and the fragrance of the Californian grown leaf. And so of many other things, which we still continue to largely import. But we have done much towards the reclamation of our economic wastes, and hope, in due time, to see their borders still further restricted. If, in the walks of high art, we are a little behind, we have still the Big Trees, the ponderous beet and the miraculous pumpkin to fall back upon. If with us the products of the pencil are not quite up to the standard of the Old World schools, our machine pictures are not to be beaten.

A LONDON dispatch states that the deposit of 750,000 francs ($145,000) required to be made in London under the Colombian concession to the Isthmus Canal Company, before the work can be formally proceeded with, was definitely paid there on the 19th inst. to the banker appointed by the United States of Colombia to receive it.

A PROJECT is on foot in Germany for sending a large selection of German manufactured goods to South America, to be displayed in an itinerant exhibition, as a means of making the population acquainted with German manufactures and thus securing a fresh market for the same.

Antimony Deposits of Arkansas.

Recent discoveries of deposits of sulphide of antimony in southwestern Arkansas are attracting considerable attention, and the subject has seemed of sufficient importance to interest the American Institute of Mining Engineers, before which Charles E. Wait, C. E. M. E., of Rolla, Missouri, lately read an interesting paper referring to these discoveries and their magnitude. In the winter of 1874, Mr. Robert Wolf discovered a vein of ore which was unknown to him and its composition not thoroughly understood in the locality. Samples were analyzed by experts and pronounced sulphide of antimony—stibnite. Three mines have been opened since the discovery and a number of interesting minerals of the antimonial series have been found.

The three mines are situated in the northern part of Sevier county, and may be reached by the St. Louis, Iron Mountain and Southern Railway to Fulton, thence by wagon-road to Columbus, Nashville, Center Point, and to the mines. During most seasons of the year the roads are good, and the distance from Fulton to the mines is about 60 miles.

One of these mines, the "Bob Wolf," is situated about two miles west of the Cossatot river, in section 10, township 7 south, range 31 west. There is a question of doubt as to the exact time of discovery, but it seems to have been in the early part of 1874. Large pieces of the sulphide of antimony were found on the surface, which were weather-worn, but when broken showed the bright metallic luster peculiar to the freshly-fractured stibnite. Mining operations on a small scale were commenced without delay, and in a few years a hole was dug from which were taken several tons of very good ore. The ore is found in a vein nearly a foot in thickness at the surface, with strike N. 13 E., and dip approximately vertical. The veinstone accompanying the ore is quartz, stained with oxide of iron, and has received locally the name of "antimony quartz." The vein has been traced in an easterly direction for a distance of two miles, but at this point the prospect seemed to be most promising. The ore appeared in quantity, and several tons of selected ore were taken from the prospect shaft, but upon inquiry it was found that no immediate use could be made of the ore, as there were no smelting works convenient for its reduction. Such being the case they deemed it advisable to cease operations, at least until a market could be found for the mineral.

The second mine, the "Antimony Bluff," is situated in an easterly direction from the one described, and about two miles distant, on the eastern bank of the Cossatot river, on an elevated bluff in section 6, township 7, south, range 30, west. The deposit was discovered by a man named Batson, but was not given prominence until taken hold of by D. C. Ladd. It is said to be a continuation of the Wolf lode; however, there is some doubt as to the accuracy of this statement. The claim was sold to the Little Rock mining company; and in October, 1876, a shaft was commenced upon the vein, which has a strike N. 13° E., with a dip 70° N.

At the surface the vein had a thickness of several inches, but soon increased to two feet, and retained that dimension for about nine feet in depth. The rock strata through which this vein passes transversely is a very compact siliceous sandstone, while the veinstone accompanying the ore is quartz.

The ore obtained was antimony ocher—cervantite; some pieces were exceedingly pure, weighing as much as 300 pounds. The crystals in many cases have a bladed structure, resembling somewhat the sulphide, which has, in all probability, been changed to oxide. This conversion is quite evident; crystals of from four to five inches in length, and one inch in diameter, are apparently all oxide, but when fractured show a central core one-half inch in diameter of unaltered and mirror-like stibnite.

Below this depth, nine feet, the vein diminished in thickness, changed somewhat in direction, conforming more to the rock strata, and yielded ore of ocher and stibnite. At 20 feet in depth the vein was 14 inches in thickness; below this the ocher had nearly disappeared, and at 30 feet it was replaced by solid glance, the vein here having a thickness of 30 inches. At this point large masses of stibnite, fibrous in structure, were taken out, weighing from 100 to 500 pounds.

The third mine, the "Stewart Lode," is the most extensive deposit of antimony yet found in Arkansas. It is in section 4, township 7 south, range 30 west, in an easterly direction from the Antimony Bluff mine, about two miles distant, and is supposed to be a continuation of that lode. It was discovered by J. H. Anderson, in February, 1877. The surface indications in this case were quite interesting. The vein has a strike about N. 13° E., with dip nearly vertical. The ore in large pieces was exposed to view in several places within the distance of a few hundred feet. In many places in this distance the ore and quartz seemed to be a solid mass projecting above the ground.

Soon after the discovery was made mining operations were commenced. The vein was attacked on the surface for several hundred feet, and was removed to the depth of 12 feet. Some fine pieces of ore were taken from this open cut, one piece of apparently solid stibnite, weighing 720 pounds, was shipped to Little Rock; other pieces even heavier were raised to the surface. One other piece furnished 1,250 pounds selected ore.

In order to test the character and extent of ore in this lode, several holes were dug, and in each case satisfactory results were obtained, sufficient at least to warrant a moderate expenditure in sinking a shaft. This shaft, 8 feet by 5 feet, was commenced near the eastern extremity of the cut. Some very large and pure pieces of stibnite were taken from this shaft, as well as one or two interesting minerals.

The shaft was sunk to the depth of 32 feet, and at about 18 feet two drifts were started east and west on the vein, but were continued only a few feet. Some excellent ore was taken from these drifts.

Little or no difficulty was experienced in sinking this shaft, as the formation was a black shale, easily removed with the pick, with an occasional blast.

At the bottom of this shaft the vein of quartz which carried the mineral had assumed a thickness of one foot, the ore however occupying only four inches. This mine like nearly every other mine in Arkansas has been worked only for a short season, due, in most cases to the fact that the parties interested had little or no means to invest in such precarious enterprises, at least in a new mining section with undeveloped and untried veins.

In this instance mining operations were stopped July, 1877, but previous to this time there was a general cleaning up, and the ore was selected, and placed in casks for shipment. A large amount was necessarily lost, as this separation was effected by hand. On June 20th and July 5th, 45 casks and 10 casks respectively were gotten ready for shipment, and in all about 25 tons (2,240 pounds) were shipped to Messrs. Hallet & Co., London, for which about $60 per ton was paid.

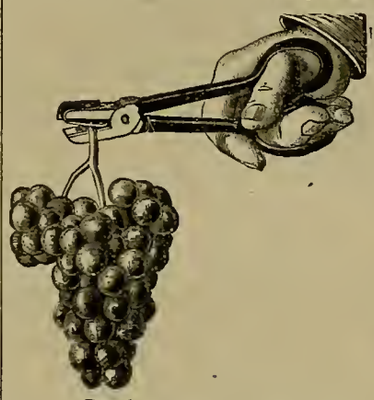

Fig. 1.

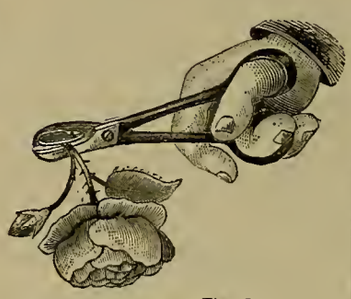

Fig. 2.

WEEKS' GRAPE, FRUIT AND FLOWER PICKER.

Grape, Fruit, and Flower Picker.

As a device now timely, we give an illustration of a fruit, grape and flower picker, which we have heard highly recommended. Its mechanism is quite fully seen by the engravings, and its use is too obvious to need comment. It is designed to save the hands from injury, which is always more or less imminent when grape-cutting by knife power is in operation. It also saves the skin from contact with the spines, with which some fruit trees are armed, and in rose gathering it disappoints the traditional thorn with which the queen of flowers is accompanied. The tool is a pair of shears arranged with an elastic holdfast that cuts the stem and holds it, so that the fruit can be deposited in the receptacle for receiving it without touching it with the hands. It is said to be so perfectly contrived that it will hold "a cherry or a bunch of grapes weighing five pounds." A point of great importance in the case of some fruits is that they may be picked and deposited in the basket without handling. Fig. 1 shows the large size picker, suitable for orchard use.

Fig. 2 shows a smaller size of the implement, which is adapted to flower picking, and which may do our lady florists good service. The pickers are known as the Weeks pickers, and are sold in this city by Dunham, Carrigan & Co., 107 Front street, S.F.

The British Channel Tunnel.—The great tunnel under the British Channel with which it is proposed to connect England and France has not yet been fairly commenced, but the engineers have sunk a shaft near Sangatte, in order to ascertain the depth and currents of the water. When these preliminary experiments are concluded the work of making the tunnel itself will begin. The shaft now being sunk has a diameter of about nine feet, and is to go to the depth of 260 feet. Work in the shaft has been suspended for the last three months, as the water comes in so rapidly that it has been necessary to construct a machine which will extract 600 gallons per minute, or double what the machine first used could remove. The shaft has already been sunk to half the proposed depth. The walls of the shaft are being lined with small oak planks, with a backing of concrete. The earth which has been excavated is of a white, chalky nature, and very hard.

Ottoes from Citrus Fruits.

There are several subtle products derived from the fruits and flowers of the citrus family which have we believe received but little consideration in this State, but are still entitled to attention because of their place in the world's production and commerce. We refer to the ottoes derived from citrus flowers and fruits and perfumes prepared with their aid. These products are highly esteemed in other parts of the world, and supplying the demand for them returns fitting rewards to the producers. We shall therefore collect some facts about these fragrant industries and the manner of their pursuit, acknowledging our debt to foreign writers for the several statements made:

Of all scent-yielding plants none has a value at all equal to that of the orange. It is a mine of perfume in itself. The blossoms yield, according to their mode of treatment, two distinct odors, one having the true scent of the flower, the other a scent called Neroly. Orange peel, too, furnishes a delightful perfume, with which all of us are familiar; and lastly, the leaves give a scent inferior only to the true Neroly. Here then we have from one plant no fewer than four perfumes. When in full vigor each tree yields on an average 25 pounds of blossoms annually. Many plantations of orange trees at Nice are more than 100 years old. At Fontainebleau there may now be seen orange trees bearing flowers and fruit at the same time, that were planted 200 years ago. At Nice a public market exists for the sale of orange blossoms during the season when the trees are in bloom. The bitter orange flowers fetch 3d. per pound, those of the sweet orange 2d. At Nice the market season for such flowers generally lasts upwards of a month, and during that time there are sold from 15 to 18 tons of flowers daily! A ton of flowers will by means of distillation yield say 40 ounces of Neroly otto, worth 20 guineas; and the residuary water—orange-flower water—5 guineas. Orange-flower fat, or butter, and oil are manufactured to a large extent by the enfleurage and macerative process; it requires about eight pounds of blossoms to enflower one pound of grease, the operation being divided into about 30 repetitions of a small quantity of flowers over or in the same grease. By digesting this orange-flower grease in the proportion of six to eight pounds in one gallon of rectified alcohol, there is obtained the extract of orange flowers, a handkerchief perfume which is surpassed by no other scent; it is exquisite in itself, and, when blended with extracts from other flowers, it composes what is termed a "bouquet."

The 'Ecuelle for Otto Making.

The otto of the orange fruit is procured from the peel by what is termed the 'Ecuelle process. The 'Ecuelle, as shown in the engraving, is a tinned-copper bowl, furnished with concentric rows of short spikes or teeth, and a hollow handle with a gutter from it to the edge of the bowl, through which liquid from the hollow can be poured. In order to obtain the otto, the fruit is rolled by hand over and over the spikes, thus breaking the peel in such a manner that the otto spurts out into the 'Ecuelle, and finds its way into the hollow handle, which, when full, is emptied into another vessel. An inferior quality of otto is procured by rasping and slicing the peel, and then pressing out the juice; and this, and the better process just described, are those by which the fruits of all the citron-worts are divested of their scent-yielding properties, operations which are put into practice to a great extent at Messina, in Sicily.

The *Citrus bergamia*, or bergamot lemon, is a plant of great value as a scent-yielder; its perfume is so much in demand that its annual production in Italy has never satisfied the market. The Messina dealers and their allies carefully adulterate the true bergamot otto with lemon otto, thus spoiling an article worth from 30 to 40 shillings per pound, in order to sell it at 10 shillings. One hundred fruit will yield about three ounces of otto. The name of this variety of citron-wort is derived from the city of Bergamo, in Lombardy, from whence, so far as we can ascertain, the otto was first sold. The otto of bergamot, of the finest quality, is obtained by means of the 'Ecuelle, but about four-fifths of it in the market is a distilled product, or one expressed from the rasped rind of the fruit. About 40,000 pounds of otto of bergamot are annually imported into England.

Among one of the leeward Carribbees is Montserrat, a little island on which *Citrus limetta* grows most prolifically, and in almost an indigenous manner. Under the care of Mr. Joseph Sturge the Montserrat company, of which Mr. Sturge is director, annually produces no less than 1,000 pounds of the true otto of citron, all by means of the 'Ecuelle process, and it is so pure that it is worth twice its present price in the market, but the products of Sicily, which are by no means good, compete with it to its disadvantage. Mr. Sturge states that "his orange orchards consist of about 500 acres, and that each acre contains about 200 trees. It takes seven years from the seed for them to come into full bearing; they flower more or less whenever they get heavy rain, and the fruit ripens in about four months after the flowers appear." He therefore gets fruit all the year round, but the chief harvest is from September to January.

The importation of from 85,000 to 90,000 pounds of otto lemon annually into England proves that Britannia has a great liking for this scent, which is extracted by rasping the fruit and afterwards expressing the pulp so produced of the *Citrus limonum*. The otto of lemon in the market is principally from Messina, where there are hundreds of acres of lemon groves; indeed, the extraction of the ottoes of lemon, orange and bergamot constitutes the chief industry of Sicily, particularly in the vicinity of Palermo. Here, instead of the 'Ecuelle for breaking the peel, a drum spiked inside is employed, and in this 100 fruit or more are operated on at one time; no doubt, sooner or later, steam will be employed to rotate these drums, and thus we may expect the supply of these scents to be kept up equal to their demand; nevertheless, as the land of Italy is already occupied, there is ample room in European markets for similar ottoes, should they be produced in other parts of the world.

The New Patent Bill in England.

Whatever cause for complaint may exist in the United States against our Patent laws, it would seem as if English inventors considered them as near perfection. This idea crops out in the strenuous opposition to the new Patent bill in England. This bill proposes to have unpaid commissioners, an absurd and suicidal provision. Another feature of the bill is the provision to keep open the specification of a patent for the benefit of those wishing to oppose the grant of letters patent, thus keeping the invention out of the hands of poor men, who are really the only inventors, upon the theory that "necessity is the mother of invention." Wealthy men do not invent anything as a general thing, and the result would be disastrous to English industries. Besides this requirement would be a direct invitation to all interested in any certain line of manufacture to which the invention pertains, to oppose its issue by fair or foul means. Patentees are also required by the bill to work the patent within a specified time; another dab at the poor inventor. It does not seem probable that such a bill can be confirmed.

Referring to the bill in general, the *English Mechanic* says:

The inventor belongs to a class which it is becoming more and more necessary for this country to encourage, and it would be bad policy to look too closely into his profits without taking account of the benefits conferred upon the public. At present it is possible to hold a patent for 28 years, the Privy Council having power to extend the time for 14 years, but it is very rarely exercised, and an extension of any kind has to be literally fought for. It has been considered advisable to abolish this power, and to make the possible duration of all patents 21 years, depending entirely on the payment of the fees. The United States gives 17 years' protection for seven pounds, a sum which appears remarkably small when contrasted with our heavy stamp duties. It should not, however, be forgotten that we allow one patent to cover many things which in America would be made the subject of separate letters and charged accordingly; but our system needs most rectification in the scale of fees payable at the preliminary and first stage of a patent, and inventors generally would probably be satisfied with the proposed assimilation of our law to that of the United States in the matter of time if the assimilation were also extended to fees.

England is very much exercised about American mechanical progress, and will either be forced to copy after the go-ahead Yankee, or give up the commercial supremacy. The condition of the inventor in the United States is envied by foreign inventors, for the very good reason that our laws are like our inventions, appropriate.

Mineral Springs of Lake County.—No. 1.

EDITORS PRESS:—According to promise I proceed to give you and your many readers a sketch of one of the numerous medicinal springs with which Lake county abounds. In some future communications I may speak of others, but in this I shall confine myself to Anderson's, owned and conducted by the Anderson family, consisting of the venerable mother, now verging on fourscore years, her son-in-law and four daughters. The place is new, having been located only five years since by Dr. A. Anderson, of Virginia City, and the present owners. The place is as yet but partially developed, but that in the near future it will be one of the most noted and valued resorts for the afflicted, no one who will take the pains to examine can for a moment doubt. And surely, for the soul-sick, weary brain worker, or the city-imprisoned, overworked business drudge, earth holds no quieter, lovelier, or more nerve-renewing nook. There are at least 15 springs, all of different mineral and medicinal properties. The favorite drinking water of all classes is the blue sulphur spring. The water looks, smells, and tastes to me precisely as the water of the far-famed Blue Lick springs in Kentucky, and I have no doubt the medicinal properties are the same. This water, when used in conjunction with the natural steam baths, is insured by the proprietors to give relief in all cases of dropsy and kindred diseases.

Next in importance are the steam baths, prepared in nature's own laboratory. As a remedy for paralysis, sciatica, neuralgia and rheumatism, they cannot be overrated, and the inhaling of the medicated vapor must be of unknown value to lungs affected by asthma, bronchitis, or sore throat of any kind. You see there is nothing artificial about the whole thing; you just enter a hole in the mountain, and though at first the intense darkness, the heat, the villainous odors, the horrid noises, all hespeaking a nearness to Hades, anything but comfortable to the average sinner. Yet a few minutes dispels the fear, and to any in pain there comes such a relief that we forget all else. The nearly boiling stuff, I can hardly call it water, which issues from beneath this bath, is conveyed in wooden pipes to the bath-rooms of the hotel. These pipes are made by boring pitch-pine logs. The doctor found the medicinal qualities much improved by mixing with those of the pine, which are of themselves a specific in many diseases.

The white sulphur water is used in connection with the iron near by in cases of general debility and nervous prostration. The epsom salts spring is a combination of druggist's stuff, highly recommended both by the doctor and those who have used it, for dyspepsia, constipation of the bowels, liver complaints, and so on. Folks who who fancy or need them can have them for all of me. Ugh! the nauseous snuff! I am glad I am not sick, so let us trot off to the sour spring, and then go to the croquet ground and have a game. See that cabin perched on the hill yonder! That is going to be fitted up to have little surprise parties in, just near enough for the sick folks to hear the music, and too far off for them to be disturbed by the merry maker's jollity. It is pretty hard climbing to reach this same old sour spring, but no matter, we are more than repaid for our labor. Did you ever in all your experience see more truly magnificent scenery? The elevation of the mountains, the depth of the canyons, the size and variety of the trees, the multiplicity of the shrubs, bushes, ferns, vines and wild flowers. See, in one direction, Cobb mountain grandly wooded to the very top. In another direction, far above all others in hight, rises Mt. St. Helena. Here the artist should come to study his art; here he would find colors the most brilliant, varied and blended in a way that even his mimic art fails to produce or copy.

A Lecture to Spring Visitors.

Can you tell me why it is that of the thousands who come to the country, and especially to the springs every year, the large majority come not to impart or gain knowledge, not to entertain or be entertained, not to rest, not to comfort or be comforted, not to set the babies free and let them have a *real* good time, whether that means dabbling in the water, rolling in the dirt, clambering over hill, dale and rock; no, no, not a bit of it. What *do* they come for? As far as I can see they come to do a whole year's growling, grumbling and fault-finding. The roughness of the road, the hardships of the trip, the uncouthness of the people, the heat of the weather, the abundance of the dust, but above and beyond all the horribility—I believe that expresses it, of the cooking in general, and the place they stop at in particular. Now, surely, no right thinking intelligent man or woman ever slept to dream that a country hotel was a home. Moreover, I assure these people they get the very best the country affords, and further, just because of this everlasting growl, 'tis almost impossible to get help to fix things up any better. Let us rather, as Topsy observes in "Uncle Tom's Cabin," "Think on our marcies! If they find it so hard to live a few days on the best—law blest their lot—in comparion to those whose life is spent with the worst."

These hotels are or should be a kind of school, always open where the meeting of well-bred, well-to-do, well-educated people, and an interchange of thoughts, opinions and experiences on the leading topics of the day, would give birth to enlarged ideas, higher intellectual and literary movements. Cultivate friendship; do away with sectionalism; make us ambitious of excelling in some art, science or accomplishment, so as to enable us to take an honorable or a pleasing part in them. In this manner our time would not be wasted, and what a store of useful and pleasant memories would we not take back with us. JOE.

Lower Lake, Cal.

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Five Acres in Orchard,
— CONSISTING OF —
Orange, Lemon and Lime Trees, Nuts, FIGS, BANANAS,
Together with a great variety of other Fruits, large and small, and GRAPES. The Banana ripens readily in this locality. TWO ACRES are set off for an
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Which is now filled with Shrubs, Flowers, and a fine growth of ORNAMENTAL TREES, 170 in number, now 10 years old. In connection with these grounds there is now a
Small Cottage and Farm House,
Well built and hard finished. On the higher ground there is a
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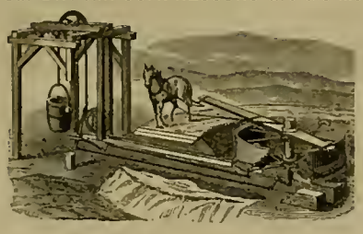

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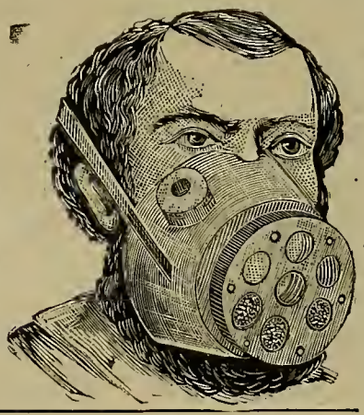

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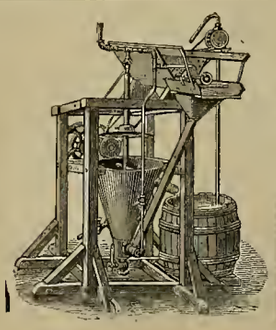

Nothing about it to get out of order or wear out. Weighs only 500 lbs—heaviest piece weighs 100 lbs. Is automatic in its working. Measures, feeds, screens and passes all material through a large body of quicksilver; then washes and cleans without care or attention. Requires no more power than a large grindstone. Uses water over and over again where water is scarce. All water required can pass through a ¾-inch pipe. Capacity, two to four tons per hour. Saves 90% of precious metals. Price, $250. Pump $25 extra. Send for circular.

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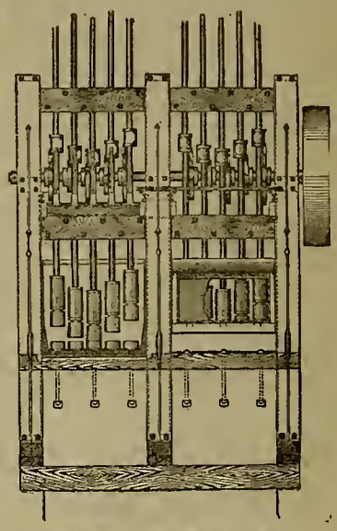

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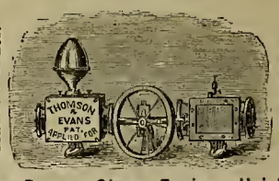

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[CONTINUED FROM PAGE 101.]

Tybo Con. mine is looking well and yielding ore in abundance. The smelters are not in operation at present, but the mill is running steadily. It has been fully demonstrated now that the quartzy ores, which were considered too light in lead to be smelted successfully, can now be milled at an excellent profit.

WINNEMUCCA DISTRICT.

OHIO LEDGE.—*Silver State*, Aug. 5: The vein in the shaft of one or two claims on this ledge is from five to six ft wide and carries from two to four ft of pay ore. The other claim is being prospected by a tunnel which follows the lead. The vein in the tunnel is six ft wide and the ore streak from two to four ft wide.

ARIZONA.

TOMBSTONE.—*Citizen*, Aug. 1: The Tombstone company's mill is now running through from 15 to 20 tons of ore per day, and has already turned out over $90,000 worth of bullion. The roaster is now in good running order. While in San Francisco Superintendent White, of the Contention, completed arrangements for the erection of a mill for his company. The mill will be a 20-stamp wet crusher, with 14 pans and 7 settlers. The boiler and hoisting works for the Tough Nut will be shipped from San Francisco soon after the first of the month and put into operation without delay. The main shaft is down over 100 ft now and will soon connect with drifts from the west shaft. It will tap the vein at about 160 ft. Over 50 miners are employed on the works at present, some working eight, some nine and some ten hour shifts.

YUMA.—Reports from Silver district, near Castle Dome, are favorable. The Iron Cap mine main incline is in about 85 ft, working double shifts night and day; the quantity of ore is increasing and looks as rich as any yet taken out, and the lowest assay yet made from this mine gave $228, the highest, $2,451. About 100 pounds of this metal is brought up by every shift. Men have been set at work on the Emma mine this week, and a shipment of 10 tons will soon be made. Five men are placering on the Red Cloud and have 125 sacks of selected ore.

PRESCOTT.—*Arizonan*, Aug. 2: The Hidden Treasure, a mine quarter mile up the creek from the Accidental, has a shaft down 35 ft, which shows an ore vein four ft thick, that will work $40 per ton in free gold. On the footwall is a pay streak that prospects $200 per ton. No sulphurets have been found in the shafts, which is very fortunate.

ITEMS.—*Silver Belt*, Aug. 1: An important discovery of gold and silver-bearing quartz has been made in the Santa Catarina mountains by S. D. Ramsdall. An assay gave $75 gold and $72 in silver. The ledge is reported as averaging 100 ft wide.

GLOBE DISTRICT.—Richmond Basin mines are steadily improving, and it is now evident that the rich ores are inexhaustible. The Mack Morris is the center claim as it is also the "Bonanza" of the district. Independent of the main ledge, three others exist on this claim running nearly parallel with, though dipping toward it, carrying the same character of ore as the main ledge, thus showing they all come from the same source. The first-class ore worked from this mine gave an average of $2,000 per ton, while smaller lots of picked ore have run as high as 6,200 ounces. This mine is rendered remarkable from the fact that the ore is uniformly rich and extensive from end to end of the claim and from top to bottom of every shaft, the number being six in all. Ore is now being extracted from the new shaft on the west end of the main ledge that gives $12,000 to the ton. To the south of this mine is situated the Silver Nugget running almost at right angle to it, the north end commencing at the south side line of the Mack Morris, consequently all veins of the Nugget pass through the side ground of and terminate in the Mack Morris lode. The Silver Nugget has gained a wide reputation as a silver producer, having had large quantities of ore worked that gave from $3,000 to $20,000 per ton.

YAVAPAI.—Arizona *Miner*, Aug. 1: We were shown to-day specimens of ore from the Golden Chariot and Harrisburg mines, which are nearly one-half gold. These mines are situated on Groom's creek, about six miles from Prescott.

COLORADO.

NEEDLE MOUNTAIN.—San Juan *Prospector*, Aug. 2: The Corsair lode, owned by Chicago parties, is a promising mine, and shows a very fine streak of mineral. Assays of 253 ounces to the ton in silver have been obtained from this lead. The Occidental lode, another of the properties of the Chicago company, has given a milll run of 96 ounces.

MINERAL CITY.—Kurig & Nelson have just completed their contract of sinking a 25-ft shaft on the Devenport and have commenced work on the Wicker, an extension of the Boston, owned by F. J. Pratt & Co. W. Boot & Co. have several men at work on their mines, viz.: The Thunderboldt, British Queen and Pride of the West. In the Great American, an extension of the Eighth Wonder, some very nice carbonate ore is being taken out, while farther on, on the same vein, W. McCay, of Cherokee, Iowa, is engaged in working the Graham lode, taking out pay ore. The Palmetto, located about one-half mile from the Eighth Wonder, is being worked with a large force of men and the ore, which is very high grade, is being shipped to the Lee mills at Capitol City. Burro trains pass here daily, loaded with ore from Tabor's mines. A cabin has been built on the Big Giant and new contracts let to Pat McEnany. The present developments are a 50-ft shaft and 114-ft tunnel. Some beautiful gray copper was taken out last week which assayed 271 ounces to the ton.

CUSTER COUNTY.—*Prospector*, Aug. 2: On Wednesday last a Mr. Marietta, who has been digging a hole in the Carbonate district north of the Baltic lode, and not far from the Rambler, struck a very good body of ore at the depth of 52 ft, which showed up by actual mill run 27 ounces of silver per ton. On the Iron Mountain a three-ft vein of mineral was uncovered yesterday that looks very rich. From the Silver King a mill run of 570 pounds of vein matter—unassorted—gives 44 ounces of silver per ton. A mill run from the Last Effort, 600 ft east of the Rambler, at a depth of 52 ft, shows 27 ounces. The Quaker City, northwest of the King of the Valley, is showing up very beautiful at 25 feet. An assay has been obtained showing 40 ounces to the ton. The ore is in abundance. The Tontine, seven miles east of the city, is showing up splendidly, and bids fair to become an extremely rich paying mine. The dump now can be sold, though the shaft is but 10 ft, at a very handsome sum per ton. The Cora Lillie, an extension of the Bull-Domingo claim, belonging to the Marsden Bros., is being sunk, parties having commenced sinking the shaft this week. The shaft is now down 20 ft. The same body of ore as that found in the Domingo-Bull mine will undoubtedly be reached within 10 or 15 ft. The Bull mine is being worked actively and huge piles of rich ore are being taken out.

IDAHO.

YANKEE FORK.—*World*, Aug. 1: The first shipment of ore this season was sent out on 158 mules a few days ago. There were 25 tons of it, worth $300 per ton. E. M. Wilson lately returned from the Saw-Tooth range, bringing ore that assays $1,000 per ton.

MONTANA.

BEAR DISTRICT.—*New Northwest*, Aug. 7: The country around Beartown has been known for some time to have good quartz. In First Chance and other gulches a large number of leads have been located and developments made shows that the quartz—gold-bearing—exists in large quantities. Of late there has been considerable excitement over a reported discovery in Washoe gulch, at the head of Bear and north of First Chance gulches.

ITEMS.—*Miner*, Aug. 5: The shaft sunk on the Stevens, 200 ft east of the main shaft, has reached the depth of 25 ft. It shows a well-defined lode, six ft wide, and similar in all respects to the portion cut by the main shaft. The calcining furnaces, rolls, Blake crusher, etc., of the O. & M. smelter are at work preparing the first lot of ore for the reverberatory, which will probably start up in about ten days, perhaps less. Glendale letter of the 20th ult. says: The large furnace is running and has turned out since the fire eight car loads, which average 460 ounces of silver per ton, equal to 4,000 ounces per car load, since 10 tons makes a car load. There is now on hand 150 tons of copper matte ready to be crushed. In the "Twin Stevens" has opened with a 40-ft shaft to water level, and 50 level to the east from bottom of shaft. The level shows a 16-inch vein of high grade smelting ore, of which a small lot has already been delivered at the works of the C. & M. S. Co. Salton Cameron, of the Cable district, has lately ordered from the East a five-stamp mill to be put upon a mineral deposit of singular character lately struck a few miles below Cable. Instead of a vein or lode as in the ordinary type of the Montana mineral-bearing rock, the new discovery appears to be of a widely different formation, consisting of a limestone country rock, through which pockets of rich ore are dispersed so thickly as almost to touch one another. The territory embracing this formation is about 400 yards square. Very shallow prospecting shafts brought to light so large an amount of very high grade ore that Mr. Cameron, an experienced miner of very cool judgment, considered himself abundantly justified in ordering a mill at once, without waiting to explore to greater depth. Appearances indicate a most valuable discovery in this new departure in Montana ore deposits.

New Curiosities at the Smithsonian Institution.

A number of interesting specimens have, according to the Washington *Republican*, been recently added to the ethnological division of the Smithsonian Institution, among the most important of which are the following: A carved figure of a man's head, made from iron pyrites. It was found in southwestern Mexico, and is supposed to have been an amulet, belonging to a great cazique, during the reign of the Aztecs. The work is highly polished, and presents a beautiful green and gold appearance. The eyes, nose and teeth are brought out in bold relief, the former being composed of opals, which gleam like sparks of fire. The features are of the most pronounced Aztec type. In a large cave, about two miles from Silver City, Col., there were found some specimens of ancient remains, which are supposed to have been made by the Pueblo people. They consist of arrows, which still have remnants of their sinew shaftings, rain gods, and fetiches in carved and painted wood, tribal totems, and bundles of straw bows and arrows. All these articles are in a remarkable state of preservation, and it is thought that the cave in which they were found was formerly used as a burial place. The entire collection was presented to the Smithsonian, and will be placed on exhibition in a few days. Probably the most important relic that has been added to the museum in a long time is an obsidian vase, made from itztle, or volcanic glass. The workmanship on the vase is perfect, not a flaw having been discovered in the work. It represents a monkey in a sitting posture, with his head bent slightly forward. In the back and shoulders are apertures in which articles for ornament were placed. The carving is exquisite, and shows what perfect lapidaries the semi-civilized people who made it were, as the material of which it is composed is considered the hardest to work in, owing to its brittleness. This relic was also found in the Aztec country of southwestern Mexico.

On the first floor, in the main hall, stands another curiosity which deserves particular attention. It is a large case, nine feet by four and one-half wide, containing numerous species of snakes, all of which are alive. Through the top, which is covered with glass, the movements of the reptiles can be plainly seen. The cage is filled with stumps of trees, grasses, ferns and sand, and an artificial lake keeps the ground continually moist. There the reptiles have full sway, and although somewhat repulsive, their cage is always surrounded with curiosity lovers. Some of the varieties are: Coach-whips, indigo or gophers, chicken, black and garter snakes. A king snake is also among the collection, and has to be carefully watched, as he is fond of hugging his companions, and very frequently kills them, after which they make a meal for his highness. This snake is the mortal foe of the rattlesnake, who always comes out second-best in their fights.

The work on the annex to the Smithsonian, in which are to be stored the Centennial exhibits and contributions from foreign governments to the United States, progresses rapidly, a large force of workmen being employed. The brick work on the lower story is nearly completed, and the beams for the floors will be placed in position during this week. Nearly two and a quarter acres will be covered by the new building, and when completed it will be a great ornament. A visit to the Smithsonian will well repay all lovers of interesting and curious relics.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Alexander, Aug. 8th, $8,119.37; Martin White, Aug. 6th, $4,975.72; Belle Isle, Aug. 11th, $20,000; Independence, Aug. 11th, $4,000; Ophir, Aug. 6th, $58,763.89; Sierra Nevada, Aug. 8th, $45,347.76; Northern Belle, Aug. 6th, $3,955.29; California, Aug. 7th, $74,814.69; Florida Hill, Aug. 7th, $3,455.52; Hillside, Aug. 10th, $4,500; Northern Belle, Aug. 9th, $5,419.34; Con. Virginia, Aug. 11th, $40,630.70; Martin White, Aug. 10th, $6,280.35; Hillside, Aug. 13th, $4,500.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS TO DEWEY & CO.'S MINING AND SCIENTIFIC PRESS PATENT AGENCY.]

FOR THE WEEK ENDING AUGUST 5TH, 1879.

218,211—SAFETY ATTACHMENT FOR CHAINS—R. Y. Anderson, Santa Clara, Cal.

218,164—CATARRH APPARATUS—Geo. W. Corey, Cheyenne, Wyoming Ter.

218,173—HARROW—S. Hrris, S. F.

8,830—CARPET SEWING MACHINE—J. Hesse, S. F., (reissue).

218,127—GRUBBING MACHINE—S. G. McCann, Corvallis, Ogn.

218,281—POTATO CUTTER AND DROPPER—T. Labrec, Castroville, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewsy & Co.'s SCIENTIFIC PRESS Amsrican and Foreign Patent Agency, the following are worthy of special mention:

PIPE JOINT.—J. P. Culver, San Francisco, and T. H. Walsh, New York City, dated July 29th, 1879. This invention relates to improvements in the construction of asphaltum and cement pipss, and it consists in forming the ends so that a cold-lead-calked joint may bs made without hreaking the pips. In the construction of this class of pipes the ends of each section are enclosed hy an iron hand which protects them when hsing handled. An iron sleeve, somewhat larger than the iron bands, is supportsd around a mandrel of ths size of the exterior of the pips. Ths spsce hetween ths sleeve and the mandrel is then filled with molten lead, or other soft packing metal, and when cool the sleeve, with its lining of soft metal, is removed from thc mandrel. When pips is to he laid, one end of each section is slipped into this sleeve and the soft-metal packing is then calked so as to make a tight joint.

SAFETY ATTACHMENTS FOR CHAINS.—Richard Y. Anderson, Santa Clara, Cal., dated Aug. 5th, 1879. The object of the inventor is to produce a safety attachment for chains, intended mors particularly to make connections hetween chain or cable and mining huckets or cars, hut it may ssrve for other purposes. The invention consists in forming the shank of the hook of considerahle length, and placing the holc tbrough which the chain crank passes near ths outer end of the shank, so that ths hook will at all times swing transversely to ths chain on which it hangs, thus reducing the liahility of disengagement of the hook. A sliding plate is placed upon the link ahove the hook, which prevents the passage of more than one link through the eye of the hail. This device has heen used at thc "Little Pittshurg minc," in Colorado, and several other places, and gives general satisfaction.

ELEVATOR.—E. D. Haven, Portland, Ogn., dated July 29th, 1879. This invention relates to certaiu improvements in thAt class of elevators which are employed in stores and huildings; and it consists in the comhination of an outer and an inner frame or cage, the inner one resting upon springs within the outer one. Each of these frames or cages has an iudependent set of safety catches, which are operated successively if the rope hreaks or the elevator descends too suddenly. Iu addition to these, a supplemental device is provided which may he controlled hy the opsrator or passenger.

POTATO CUTTER AND DROPPER.—Thomas Labrec, Castroville, Cal., dated August 5th, 1879. This device relates to au improvement in potato cutters and droppers; and consists iu providing a case or hox which may he mounted on the heams of a gang or sulky plow, the hox carrying a cutting knife, which is operated by a lever moved by cams on the wheels, so that the potato is cut into two pieces, and one piece dropped at a time into the furrow behind the first plow so as to he covered up hy the second one.

HARROW.—Silas Harris, No. 7 Liberty St., San Francisco, patent dated August 5th, 1879. This invention consists in making the bars holding the teeth of what is known as "channel-iron," and providing a peculiarly made spring clamp hetween the flanges of the iron, which holds the teeth firmly in place. Wheels are provided, which are attached to the teeth at the corners so that the harrow may he moved to or from the field, when they may be removed and placed upon the upper end of the teeth in an adverse position.

ROAD locomotives are said to be coming generally into use in France; lately a 12-ton locomotive (portable engine) was harnessed to a piece of artillery weighing 43 tons, which it hrought from Vincennes to the point d'Austerlitz. This same engine is meant to carry to the plateau at Chatillon armor-plated towers, in sections weighing 30 tons each.

News in Brief.

THE Kuldja question has heen sattled.

THE Zulu king has not offered to surrender.

GERMANY intends to adopt silver as money.

TENNESSEE has voted to repudiate her debts.

YELLOW FEVER has slaughtered 11 Americans at Hayti.

ANOTHER Montreal bank hursted, the Vills Marie. $700,000 gone.

A NEW town named Beulah is to he laid out at the Mineral King mines.

FRANCE, Italy, Spain and Portugal show an immense deficit in silk crops.

A NEW race of men has heen discovered in the northeastern part of Siheria.

A BANKERS' CONVENTION is being held at Saratoga, to discuss taxation of hauks.

DR. CHARLES BEARDSLEY has heen appointed fourth auditor of the treasury.

THE river Mersey has overflowed, and caused much damage to crops in Lancashire.

GAMBETTA'S fctc cost $30,000. Ons more victory for freedom and increased taxation

J. BOLIER, who grossly assaulted a child 11 years of age at Fort Fairfield, Me., was lynched.

THE 14th Mechanics' fair, now in progress in San Francisco, is said to surpass all former exhihitions.

THE drouth is such in Shreveport that many citizsns are compslled to huy watsr for drinking purposes.

REV. DR. LAWRENCE MCMAHON was consecrated Bishop of Hartford diocess yestsrday in St. Joseph's Cathedral.

IT is stated that W. L. Gihson, lats cashier of the Citizens' National Bank, Detroit, is short $20,000 in his accounts.

THE Indianapolis Tile works were destroyed by fire Saturday night. Loss, from $30,000 to $40,000; insurancs, $30,000.

A NEW trial, in the suit of Whalen against Gsneral Sheridan, for damagcs during the war, bas heen denied the plaintiff.

THE hilliard pool championship match, betwsen Knight and Morris, at Nsw York, was won hy the latter—21 games to 19.

THREE THOUSAND miners of Silverdals, North Staffordshire, have struck against an increass of hours and a reduction of 10% in wages.

LAROE amounts of United States funded honds are heing freely taken up in London on American account, and shipped to Nsw York.

TRADE in California wines is increasing in New York; fully 1 000,000 gallons of wine, and 100,000 gallons of hrandy have besn shipped so far this year.

A CALL has hesn issued for a Prohihition Stats Convention at Altoona, Pennsylvania, Septemher 9th. It is expected a State ticket will he nominated and an address issued.

THE warm weather has considerahly improved harvcst prospects in Francs. French producers ars frightened at the decline in prices of French wheat, caused hy heavy imports from America.

SAFVET PASHA has promised ths Greek Minister that the Porte will appoint commissioners to negotiate relative to the boundary, although it would prefer to have the matter settled hy the mediation of the Great Powers.

MAMMOTH CITY, Mono county, is between 10,000 and 11,000 feet above the sea level. Though within the regions of perpetual snow, the winters are spent comfortahly, and last winter's work was hardly suspended for a day.

THE Virginia *Enterprise* says: A chicken has been hatched on the Divide with two heads and three eyes. One eye is located hetween the two heads, and the other eyes are placed on the ontside of the heads. [This is the Cyclops.]

IT is said that the San Diego Indians will celebrate the feast of San Luis Rey at Pala on the 27th inst. The celehration is expected to he a grand affair. A great many whites will he present. Bull fights will be among the chief attractions.

THE Rumpa disaffection in India is spreading. The insurgents are hadly armed, but conduct a guerilla warfare. Opsrations against them will not be successful until after the rainy season is over, when troops can follow the insurgents into their fastnesses.

SOME Italian gardeners near Stockton lately poisoned a numher of melons for the henefit of the parties who were in tbe hahit of foraging on them nights. Some of these melons got into the hands of innocent parties, and two children have heen poisoned in consequence.

THE Los Angeles *Commercial* says: Gold continues to he found in the northwestern part of the county, where the first gold ever known in California was discovered and sent to Philadelphia hy the late Don Ahel Stearns. A nugget of the value of $400 was discovered Thursday, by a Spaniard, ahout seven miles from Newhall.

INDIUM.—Indium is apparently the most valuahle of known metals, as the following comparisons of value will show. For instance, one pound of indium eqnals in value 8½ pounds of gold; 22½ of platinum; 135 of silver; 1,018 of nickel; 1,654 of mercury; 6,617 of antimony; 7,780 of tin; 10,180 of copper; 17,650 of zinc; 24,070 of lead, and 132,354 pounds of iron.

THE government of Guadaloupe, West Indies, offer a prize of 100,000 francs to the successful inventor of a new method of manufacturing sugar, by means of which more than 14% of sugar can he ohtained from the cane. It is distinctly stated that the improvements are not to apply to present machinery, hut to an improved method of manufacture.

Mining District at Sullivan, Maine.

In a paper upon the above subject, read by C. W. Kempton, mining engineer, of West Sullivan, Maine, before the American Institute of Mining Engineers, it appears that the above district has been in process of development for the past ten months.

The district is in southeastern Maine, and extends from the town of Franklin, through Ifancock, Sullivan and Gouldsborough, from northwest to southeast, about 16 miles. Sullivan is situated at the head of Frenchman's bay, 10 miles from Bar Harbor, Mount Desert, 12 miles from Ellsworth, and 37 miles from Bangor.

The staple production is granite, and first impression would declare that no other kind of rock existed there, but closer examination reveals more slate than granite, and that the mineral veins of the district are found along or near their line of contact. The slates of the region are quartzitic, of unknown age, undoubtedly very ancient, and referred to the later Laurentian—the limbo to which most of the doubtful New England rocks are consigned. Through these have been thrust the immense mass of granite and its allied rocks, from which action has proceeded the formation of the principal mineral deposits.

The first discovery of silver ores here was made by Mr. A. A. Messer, in May, 1877. They were discovered below high-water mark, on the shore of the bay, at the site now occupied by the shaft of the Sullivan mine. The vein, when found, showed about 10 inches of quartz, carrying pyrites, galena, and traces of brittle silver (stephanite).

A coffer dam was built and shaft commenced. The first native silver threads were found about 10 feet down. The vein was uncovered in several other places, also below high-water mark, proving that the showing at the shaft location was the poorest yet found. Seventy-five feet from the shaft, southeasterly, the quartz is four feet wide at three feet below the beach, and the lowest assay known from this is over $200 per ton in silver. The ore is principally stephanite.

Proceeding with the shaft, at about 30 feet depth, the vein, composed of quartz, with more or less slate highly impregnated with sulphides, was found to be four feet wide. At this time the shaft is 100 feet deep. Drifts have been run 62 feet southeast from the 75 level, and 30 feet northwest from the 85 level. About 600 tons of ore are on the surface ready for concentration. The ore is essentially silver, sulphides and native, in quartz and slaty gangues, with slight amounts of iron, zinc, etc., as sulphides, and also galena.

Of the silver minerals, stromeyerite is most plentiful, stephanite next, argentite (silver glance), common, native silver in flakes very plenty, threads frequent, lumps occasional.

Ruby silver is exceedingly rare; antimonial silver has been found. The occasional yellow copper sulphide met with has a peculiar luster and runs very rich in silver.

Arsenical iron abounds, showing gold, and giving, in some cases, an assay for silver.

Less than a year has sufficed to demonstrate the existence of strong fissure veins in this district, carrying high-grade ores, and to give every assurance of their permanency and value. The level surface of the country, covered with drift gravel, makes prospecting a slow matter.

A Library for Inventors.

We have at our patent offices, No. 202 Sansome street corner Pine, a complete set of Patent Office reports, containing engravings and claims of EVERY PATENT ever issued in the United States.

We have also a complete set of the MONTHLY VOLUMES issued by the Department, with full detailed description and large drawings of all the patents issued since the time when these volumes were first published.

A set of all the LAW BOOKS ON PATENTS is also on our shelves ready for reference. We have also the British Commissioners reports, Canadian Patent Office reports for all British North America, full files of MINING AND SCIENTIFIC PRESS, PACIFIC RURAL PRESS, *Scientific American*, *Scientific American* supplement, *American Artisan* and other American and foreign scientific and mechanical journals, as well as mechanical dictionaries chemistries, encyclopedias, and other works of reference.

Inventors and patentees are WELCOME TO EXAMINE at their leisure any of the books in the above sets, and we shall be glad to give them any assistance in hunting up what they want.

Our library is the most complete of its kind on the Pacific Coast in every respect, and we are continually adding to it as occasion demands. DEWEY & CO.,

Patent Agents and Publishers,
No. 202 Sansome street, corner Pine, San Francisco

Acknowledgement and Thanks.

LAKEPORT, Lake Co., Cal., Nov. 2d, 1878.

MESSRS. DEWEY & CO.—*Gentlemen:*—I hereby acknowledge receipt of patent, for which please accept my sincere thanks. When I have any further business in this line I shall certainly employ you. With kind regards, I am, Yours very truly, CHAS. SLATTERBECK.

SETTLERS and others wishing good farming lands for sure crops, are referred to Mr. Edward Frisbie, of Anderson, Shasta County, Cal., who has some 15,000 acres for sale in the Upper Sacramento valley. His advertisement appears from time to time in this paper.

Back Numbers Wanted.

The following volumes and single copies of the MINING AND SCIENTIFIC PRESS are wanted at this office, for which a reasonable price is offered:

Year.	Volume.	
1870	20	2 Complete volumes, 1st half (of year).
1870	20	2 Copies of No. 2, Jan. 1st.
1870	20	1 Copy each of No. 1, Jan 1st, 3 of Jan. 14th, 7 Feb. 11th, 6 Feb. 4th.
1870	21	1 Copy of No. 7, August 13th.
1871	22	5 Copies of No. 1, Jan. 7th.
1871	22	3 Copies of No. 5, Feb. 4th.
1871	22	1 Copy of No 3, Jan. 21st, 6 of Feb. 2d, and 1 of May 1st.
1871	23	1 Copy of No. 2, July 15th, and 0 Sept. 2d.
1872	24	2 Copies of No. 4, Jan. 27th.
1872	24	3 Copies of No. 7, Feb. 17th.
1872	24	2 Copies of No. 17, April 27th.
1872	25	1 Copy of No. 10.
1872	25	1 Complete volume, last half (of year).
1873	26	3 Copies of No. 8, Feb 22d
1873	26	3 Copies of No. 9, March 1st
1873	26	2 Copies of No. 10, March 8th.
1873	26	1 Copy of No. 7, Feb. 15th.
1873	27	3 Copies of No. 20, Nov. 15th.
1873	27	4 Copies of No. 21, Nov. 22d.
1873	27	3 Copies of No. 24, Dec. 13th.
1875	30	1 Copy of No. 4, Jan. 23rd.
1875	30	1 Copy of No. 5, Jan. 30th.
1875	30	1 Copy of No. 8, Feb. 20th.

EVERY new subscriber who does not receive the paper, and every old subscriber not credited on the label, within two weeks after paying for this paper, should write personally to the publishers without delay, to secure proper credit. This is necessary to protect ourselves and subscribers against the acts and mistakes of others.

Quicksilver Mining Publication.

Memoir on the Mines and Works of Almaden, by M. H Kuss, M. E. Translated from the "Annales des Mines" for the MINING AND SCIENTIFIC PRESS, by S. B. CHRISTY.

CONTENTS. — PART I. - Geological Description of the Deposits at Almaden: 1. Introduction; 2. Geological Situation and Constitution; Silurian System; Devonian System; Eruptive Rocks; 3. Deposits of Mercury; Description of the Mine; Mineralogical Constitution of the Vein Matter; Age of the Veins; Abandoned Mines PART II.—Exploitation of the Mines of Almaden: 1. Method of Exploitation; 2. Organization of Labor; 3. Mechanical Preparation. PART III.— Metallurgy of Mercury at Almaden: 1. Description of the Works; 2. Treatment of the Ore; 3. Losses of Treatment. PART IV.—Administration and History; 2. History; 48 large pamphlet pages, post-paid, 50 cents. DEWEY & CO., Publishers, S. F., 1879.

SOUTH PACIFIC COAST RAILROAD.—This popular line has made a reduction in rates between San Francisco and San Jose and Santa Clara, to take effect April 1st, 1879, viz: Regular local tickets between San Francisco and San Jose, $1.75; Santa Clara, $1.65. Round trip tickets (good until used) between San Francisco and San Jose, $3.25; Santa Clara, $3.05. Excursion tickets sold Saturday afternoons and Sunday mornings from San Francisco and Park street, Alameda, to Santa Clara or San Jose and return, $2 50; good only until Monday evening following date of purchase. Commutation tickets good for one round trip daily during calendar month, between San Francisco and San Jose, $20; Santa Clara, $19. Family tickets for 10 rides and 30 rides, also six months and yearly commutation tickets on sale at corresponding reduction in rates.

GEO. H. WAGGONER, Gen'l Pass. Agent.
THOS. CARTER, Superintendent.

FRESH attractions are constantly added to **Woodward's Gardens**, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

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EXPERIMENTAL MACHINERY, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. See ad. F. W. FULLER, 415 Market St., second floor, S. F.

Chew JACKSON'S BEST Sweet Navy Tobacco

METALS.

[WHOLESALE.
WEDNESDAY M., August 13, 1879.

IRON.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2¾@ 3¼
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 7
Norway, according to thickness	6½@ 7
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	—@—
STEEL.—	
English Cast, lb	18 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @
TIN PLATES.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7½
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb. less than cask	9½@— 10
NAILS.—	
Assorted sizes	2 90@3 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & CO.]

SAN FRANCISCO, August 13, 3 P. M.

SILVER, 25.
GOLD BARS, 890@910. SILVER BARS, 6@16 ⅌ cent. discount.
EXCHANGE on New York, 20, on London bankers, 49½@49¾. Commercial, 50; Paris, five francs ⅌ dollar; Mexican dollars, 90½@92½.
LONDON Consols, 97 15-16; Bonds (4%), 105¾.
QUICKSILVER in S. F., by the flask, ⅌ lb, 33½c.

GENERAL MERCHANDISE.

[WHOLESALE.]
WEDNESDAY M., August 13, 1879.

CANDLES.	
Crystal Wax	17 @—
Eagle	12 @—
Patent Sperm	30@—
CANNED GOODS.	
Assorted Pie Fruits, 2½ lb cans	2 25 @ —
Table do	3 50 @ —
Jams and Jellies	3 75 @ —
Pickles, hf gal	3 25 @ —
Sardines, qr box	1 67½@1 90
Hf Boxes	2 50 @2 75
Merry, Fault & Co's. Preserved Beef. 2 lb. doz	3 75 @4 00
do Beef, 4 lb doz	6 50 @ —
Preserved Mutton. 2 lb. doz	3 75 @ —
Beef Tongue	6 50 @ —
Preserved Ham. 2 lb. doz	6 50 @ —
Deviled Ham, 1 lb. doz	3 50 @ —
do Ham, ½ lb doz	3 00 @ —
Boneless Pigs Feet. 3 lbs	4 50 @ —
2 lbs	3 75 @ —
Spiced Fillets. 2 lbs	4 25 @ —
Head Cheese. 3 lbs	4 25 @ —
COAL—Jobbing.	
Australian, ton	6 00 @ 6 50
Coos Bay	— @ 5 50
Bellingham Bay	— @— —
Seattle	5 50 @ 6 00
Cumberland	12 00 @15 00
Mt Diablo	4 75 @ 6 00
Lehigh	11 50 @12 50
Liverpool	6 00 @ 6 50
West Hartley	— @ 8 00
Scotch	— @ 8 00
Scranton	— @— —
Vancouver Id	8 00 @— —
Charcoal, sack	75 @— —
Coke, bush	60 @— —
COFFEE.	
Sandwich Id, lb	— @— —
Costa Rica	16 @ 16½
Guatemala	16 @ 16½
Java	25 @— 26
Manila	17 @— —
Ground, in cs	25 @— —
FISH.	
Sac'to Dry Cod	— @ 4
do in cases	5 @ 6
Eastern Cod	— 7 @— 7½
Salmon, bbls	8 00 @ 9 00
Hf bbls	5 00 @ 5 50
1 lb cans	1 10 @ 1 12½
Pkld Cod, bbls	22 00 @— —
Hf bbls	11 00 @— —
Mackerel, No. 1.	
Hf Bbls	9 50 @10 00
In Kits	1 85 @ 2 10
Ex Mess	3 25 @— —
Pkld Herring, hx	3 00 @ 3 50
Boston Smkd Hdg	70 @— —
LIME, Etc.	
Plaster, Golden Gate Mills	3 00 @ 3 25
Land Plaster, tn	10 00 @12 50
Lime, Sta Cruz, bbl	1 25 @ 1 50
Cement, Rosendale	2 00 @ 2 25
Portland	4 00 @ 4 50
NAILS.	
Ass'ted sizes, kegs	2 70 @ 2 75

OILS.	
Pacific Glue Co's Neatsfoot, No 1	1 00 @ 90
Castor, No 1	1 35 @ —
do, No. 2	1 30 @ —
Baker's A A	1 25 @1 30
Olive, Plagulol	5 25 @5 75
Possel	4 75 @5 25
Palm, lb	9 @ —
Linseed, Raw, bbl	78 @ —
Boiled	80 @ —
Cocoanut	55 @ —
China nut, cs	— @ 65
Sperm	1 40 @ —
Coast Whales	— @ 32½
Polar	— @ 35
Lard	— @ 70
Oleophine	22 @ 22
Devoe's Brill't	17½@ 18½
Photolite	— @ —
Nonpareil	31 @ 32½
Eureka	18 @ 42½
Barrel kerosene	20 @ —
Downer Ker	35 @ —
Elaine	37½@ —
PAINTS.	
Pure White Lead	8 @ 8½
Whiting	1½@ —
Putty	4 @ 5
Chalk	1½@ —
Paris White	2½@ —
Ocher	3½@ —
Venetian Red	3½@ —
Averill Mixed Paint, gal. White & tints	2 00 @2 40
Green, Blue & Ch Yellow	3 00 @3 50
Light Red	3 00 @3 50
Metallic Roof	1 30 @1 60
RICE.	
China, Mixed, lb	4½@ 5
Hawaiian	6 @ —
SALT.	
Cal. Bay, ton	15 00 @22 50
Common	10 00 @12 00
Carmen Id	12 00 @14 00
Liverpool fine	19 00 @— —
SOAP.	
Castile, lb	8 @ 15
Common brands	4½@ 8
Fancy brands	7 @ 8
SPICES.	
Cloves, lb	— @ 45
Cassia	19 @ 20
Nutmegs	85 @ 87½
Pepper Grain	— @ 12
Pimento	19 @ 20
Mustard, Cal., ½ lb glass	— @1 25
SUGAR, ETC.	
Cal. Cube, lb	— @ 10½
Powdered	— @ 10¾
Fine crushed	— @ 10½
Granulated	— @ 10
Golden C	— @ 8½
Cal. Syrup, kgs	70 @ —
Hawaiian Mol'sses	26 @ 30
TEA.	
Young Hyson, Moyune, etc	— @ 51
Country pckd Gunpowder & Imperial	— @ 42½
Hyson	30 @ 35
Fooo-Chow O	35 @ —
Japan, 1st quality	40 @ —
2d quality	20 @ 25

LEATHER.

[WHOLESALE.]
WEDNESDAY, M., August 13, 1879.

Sole Leather, heavy, lb	22 @ 29
Light	20 @ 24
Jodot, 8 Kil., doz	48 00 @50 00
11 to 13 Kil	65 00 @76 00
14 to 19 Kil	80 00 @90 00
Second Choice, 11 to 16 Kil	55 00 @70 00
Cornellian, 12 to 16 Kil	57 00 @67 00
Females, 12 to 13 Kil	63 00 @67 00
14 to 16 Kil	71 00 @76 00
Simon Ullmo, Females, 12 to 13 Kil	58 00 @62 50
14 to 16 Kil	66 00 @70 00
16 to 17 Kil	72 00 @74 00
Simon, 18 Kil	61 00 @63 00
20 Kil	65 00 @67 00
24 Kil	72 00 @74 00
Robert Calf, 7 and 9 Kil	35 00 @40 00
Kips, French, lb	1 00 @ 1 35
Cal. doz	40 00 @60 00
French Sheep, all colors	8 00 @15 00
Eastern Calf for Backs, lb	1 00 @ 1 25
Sheep Roans for Topping, all colors, doz	9 00 @13 00
For Linings	5 50 @10 50
al. Russet Sheep Linings	1 75 @ 4 50
oot Legs, French Calf, pair	4 00 @— —
BGood French Calf	4 00 @ 4 75
Best Jodot Calf	5 00 @ 5 25
Leather, Harness, lb	15 @ 38
Fair Bridle, doz	48 10 @72 00
Skirting, lb	33 @ 37
Welt, doz	30 00 @50 00
Buff, ft	38 @ 21
Wax Side	07 @ 80

LUMBER.

WEDNESDAY M., August 13, 1879.

CARGO PRICES OF REDWOOD.		PUGET SOUND PINE RETAIL PRICE.	
Rough, M	13 00	Rough, M	18 00
Refuse	9 00	Fencing	18 00
Clear	23 00	Flooring and Step	28 00
Clear Refuse	13 00	Narrow	30 00
Rustic	23 50	2d quality	25 00
Refuse	18 00	Lathn	3 50
Surfaced	20 00	Furring, lineal ft	
Refuse	14 00	**REDWOOD. RETAIL PRICE.**	
Flooring	20 00	Rough, M	18 00
Refuse	12 00	Refuse	14 00
Beaded Flooring	23 00	Pickets, Rough	15 00
Refuse	13 00	Pointed	16 00
Half-inch Siding	16 00	Fancy	22 50
Refuse	14 00	Siding	20 50
Half-inch Surfaced	20 00	Surfaced & Long Beaded	30 00
Refuse	14 00	Flooring	30 00
Half-inch Battens	16 00	Refuse	22 50
Pickets, Rough	11 00	Half-inch Surfaced	30 00
Rough, Pointed	12 50	Rustic, No. 1	30 00
Fancy, Pointed	18 00	Battens, lineal ft	
Shingles	1 75	Shingles M	2 00

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending August 12, 1879.

HIGHEST AND LOWEST BAROMETER.

Aug. 6	Aug. 7	Aug. 8	Aug. 9	Aug. 10	Aug. 11	Aug. 12
29.874	29.932	29.934	30.013	30.028	29.938	29.845
29.830	29.867	29.885	29.990	29.922	29.837	29.809

MAXIMUM AND MINIMUM THERMOMETER.

84	62	64	60	65	63	64
53	52	51	50	52	53	54

MEAN DAILY HUMIDITY.

80.3	83	84	79.7	70	83.7	80.3

PREVAILING WIND.

SW	W	W	W	W	SW	SW

WIND—MILES TRAVELED.

244	325	244	369	286	329	281

STATE OF WEATHER.

Clear.	Clear.	Fair.	Fair.	Fair.	Fair.	Fair.

RAINFALL IN TWENTY-FOUR HOURS.

Total rain during the season, from July 1, 1879. 0.01 in

Mining and Other Companies.

Persone interested in incorporated ebares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Gover Mining and Milling Company.—

Principal place of business, San Francisco, California. Location of works, Amador county, near Drytown, California.

Notice is hereby given that at a meeting of the Board of Trustees, held on Wednesday, the 6th day of August, 1879, an assessment (No 39) of Fifty Cents per share was levied on the capital stock of the corporation, payable immediately, in gold coin or legal currency of the United States, to the Secretary, at the office of the company, Room 8, No. 402 Front street, San Francisco, California.

Any stock upon which said assessment shall remain unpaid on Tuesday, the 9th day of September, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 6th day of October, 1879, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Trustees. W. O WILSON, Secretary.

Office, Room 8, No. 402 Front street, San Francisco, Cal.

Annual Meeting—Office of the Rocky

Point Mining Co., San Francisco, Cal., July 22d, 1879. The Annual meeting of the stockholders of the Rocky Point Mining Company, for the election of a Board of Trustees for the ensuing year, and for the transaction of such other business as may properly come before it, will be held at their office, No. 314 Bush street, San Francisco, California, on Monday, August 18th, 1879, at two o'clock P. M. of that day. Transfer books will be closed on Saturday, August 16th, 1879, at 12 o'clock M.

T. L. BIBBINS, Secretary.

Annual Meeting—Office of the Mono

& Cross Consolidated Mining Co., San Francisco, Cal., August 8th, 1879. The Annual Meeting of the Stockholders of the Mono & Cross Consolidated Mining Company, for the election of a Board of Trustees for the ensuing year, and for the transaction of such other business as may properly come before it, will be held at their office, Rooms 3 and 4, No. 309 California street, San Francisco, California, on Monday, August 25th, 1879, at two o'clock, P M., of that day. Transfer books will be closed on Thursday, August 14th, 1879 at three o'clock, P. M.

J. M. BUFFINGTON, Secretary.

Annual Meeting—Safety Powder Co.

Notice is hereby given of the annual meeting of the stockholders of the Safety Powder Co., at their office, corner Octavia and Greenwich streets, on Saturday, the 30th day of August, 1879, at the hour of three o'clock, P. M. By order of the President.

S. C. GREGORY, Secretary.

Amusements.

CALIFORNIA THEATER.

BARTON & LAWLOR.....Manager.
BARTON HILL.....Acting Manager.

IMOGENE.

Bush Street, above Kearny. Open every evening. Box office open from 9 A. M. to 10 P. M. Seats may be secured six days in advance.

BALDWIN'S THEATER.

THOMAS MACUIRE.....Manager.
CHAS. H. COODWIN.....Treasurer.
J. P. CHAPMAN.....Assistant Treasurer.

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CHAS. E. LOCKE.....Lessee and Manager

TONY PASTOR.

Open every evening and Saturday Matinee.

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M. A. KENNEDY.....Sole Lessee and Manager

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Roasting of Gold and Silver Ores, and the Extraction of their respective Metals without Quicksilver. 1870.

This rare book on the treatment of gold and silver ores without quicksilver, is liberally illustrated and crammed full of facts. It gives short and concise descriptions of various processes and apparatus employed in this country and in Europe, and explains the why and wherefore

It contains 142 pages, embracing illustrations of furnaces, implements and working apparatus.

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This work is unequaled by any other published, embracing the subjects treated. Its authority is highly esteemed and regarded by its readers; containing, as it does, much essential information to the Miner, Miller, Millman, Metallurgist, and other professional workers in ores and minerals, which cannot be found elsewhere in print. It also abounds throughout with facts and instructions rendered valuable by being clearly rendered together and in simple order. It contains 120 diagrams, illustrating machinery etc., which alone are of the greatest value. PRICE, $7.50

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Patented March 18th, 1879. Will precipitate with steam in three hours, requiring no machinery to run it. Cost of constructing apparatus, $75. The old cylinder process takes four hours to precipitate and costs from $1,200 to $1,500 to construct, besides the machinery to run it. For right to use my Precipitator address C. C. BITNER, Spenceville, Nevada County, California.

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Golden State Pressure Blowers.

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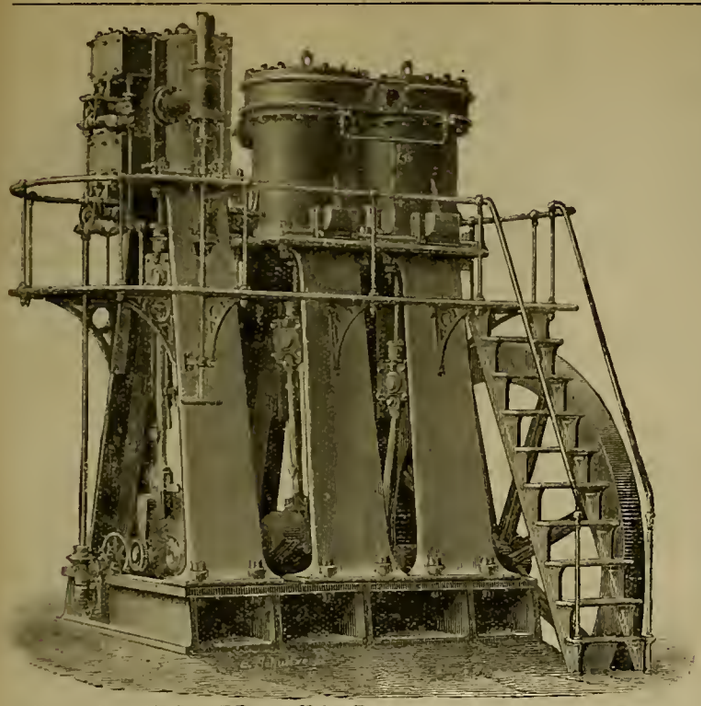

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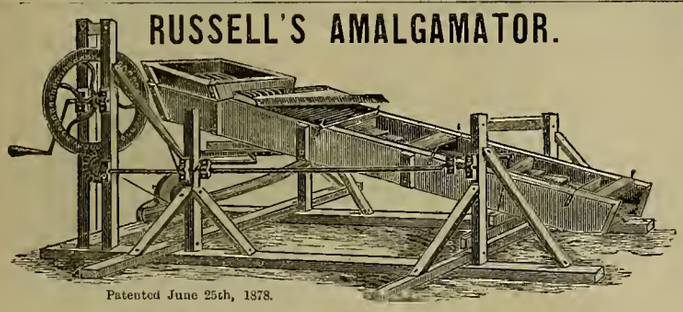

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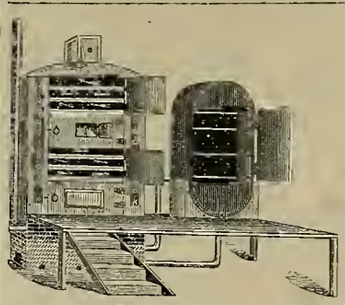

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SAN FRANCISCO, SATURDAY, AUGUST 23, 1879.

VOLUME XXXIX Number 8.

The New Era in California Gold Mining.

In contemplating the subject of gold mining in California, the impression largely prevails that the business has now seen its most remunerative and prosperous days. Remembering or hearing tell of the time when men gathered the precious metal by the ounce, and even the pound, daily, with only the pan or rocker, most people are apt to conclude that this was the true Golden Age of California; and, that having passed away, nothing like it will ever be experienced here again. And so, bemoaning the flush days of the Argonauts, the present generation relax their efforts and suffer their opportunities to pass by unimproved. Because they cannot go out and with these simple implements make the big wages of pioneer times, they feel disinclined to put forth a vigorous effort and turn to the best account the chances that still remain. Let, however, these worshipers of the past remember that this is a world of compensations, and that while the advance gold-digger was able with only these simple aids to realize very liberal pay with very little labor, he had to prosecute his calling subject to many disadvantages and drawbacks; so many, in fact, that his life may be said to have almost reached a maximum of discomfort while his revenue was often reduced to a minimum of net earnings. If his income was large, his outgo was in proportion, rendering the margin for clear gain hardly larger than at present. The average miner of that period was an itinerant sort of person, homeless, reckless, addicted to many reprehensible habits and much subject to disease, as witness the tenantry of the primitive graveyards.

It is true, men cannot now go into the mines and find paying claims as readily as aforetime; nor, when found, can they without some capital open and work them to advantage. More money and time are required now to make a start in the business than were necessary in former times. But then, the business once started, pays at present with more certainty and quite as largely as ever before. To the patient operator, having some means, the chances for making money at gold mining in this State are better now than they were a quarter of a century ago. Skill and capital have in large measure taken the place of sheer strength and muscle, and, having now the benefit of long experience, are bound to reach results that will make former returns look poor and small. But while science and money are going to so advance production, the bar-handed miner is not going to be retired from the field. A better day is coming for him as well as for the employer of large means and educated methods. In the simplified processes and cheapened machinery, coupled with the great abundance of pay material likely to present itself in the shape of auriferous sulphurets and quartz, hydraulic tailings, beach sands, etc., the poor man's opportunities are coming back to him, even here in California. It is possible today to place a quartz mill of 10-ton capacity on a mine in almost any part of the State, at an expense of hardly more than a thousand dollars, while apparatus for reducing ordinary gold-bearing sulphurets or rewashing the hydraulic tailings can be supplied and set up for even a smaller sum.

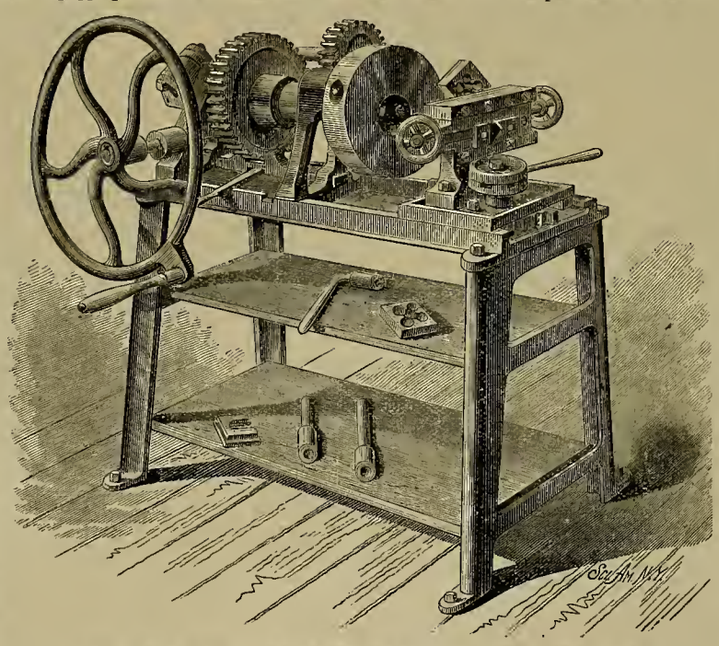
Let those who are sceptical on this point go to the Mechanics' fair, now open, in San Francisco, and see what has been accomplished in this line of improvement, and they will no longer doubt the truth of this statement. It might be wise for those especially interested in this subject to supplement such visit by an inspection of the various foundries and machine shops in the city, where also much can be seen illustrative of the progress lately made in this department of invention. Surveying the whole field, and considering the sum total of the gains here adverted to, we really believe they denote such an advance in the business as may be justly termed a new era in California gold mining.

THE United States produces annually 200,000,000 pounds of wool, and imports for manufacturing purposes about 50,000,000 pounds. We manufacture four-fifths of all goods made of wool which enter into the world's consumption, and use our own wool for four-fifths of that manufacture.

An Improved Pipe Threader and Cutter.

We illustrate herewith the latest improved Saunders' pipe cutting and threading machine, imported by Dunham, Carrigan & Co. This is a very ingeniously contrived, substantial and thoroughly fitted machine, very well adapted for general use. When a job of any magnitude is to be done, a large saving of labor is effected by it. It will be found that it is easier on both dies and pipe, and also on workmen, than the ordinary way of cutting and threading; three times the amount of work can be done on large sizes than by hand in the same time.

The machine is portable, weighing about 400 lbs. The arrangement of the gearing permits of the machine being adjusted to the work to be done, enabling one man to screw two-inch pipe with ease. There are three changes of speed. The fast speed cuts ¼, ⅜ and ½; the next, ¾, 1 and 1¼ inches; and the slowest, 1½ and 2 inches. The changes are made by the movement of the lever in front of the machine. The patent concentric gripping chuck is of substantial construction, having three jaws moved to the center by one screw—centering the pipe true. The machine is provided with a novel chuck on the back end of the spindle, for centering the pipe, doing away with guides. The die head is arranged with cutting off tool slide, and self-centering jaws, for steadying pipe while being cut off. The die starter is the long lever-working pinion in the rack at the bottom of the die head. Crooked threads can not be cut, as the pipe revolves, and the die stands still. There are no loose guides to be changed or lost. The machine can be easily arranged to operate by belt power when desirable.



SAUNDERS' IMPROVED PIPE THREADING HAND MACHINE.

The system adopted in the manufacture of these machines enables the agents to readily duplicate parts requiring renewal, and to fit them up in a superior manner. It also permits them to offer them at a price not very much in excess of the cost of a set of stocks and dies cutting the same range of sizes, with the necessary cutting-off tools and pipe vise, all of which it will to a great extent supersede; especially in a shop of some size. The device is also an excellent one for machine and jobbing shops for cutting off round iron or steel, and with the bolt-threading and nut-tapping attachment it makes a very good bolt-threader and nut-tapper. The machines are made for hand or power, or for both.

Petroleum as Fuel.

From all accounts it would seem that the use of petroleum as a fuel for steam boilers seems to be a success. The result of experiments that have been made are highly favorable. There does not seem to be anything particularly new in the manner of using it, the use itself being the novelty.

A spray of petroleum and a blast of air, both projected by steam into the furnace, produces a roaring flame, and when once started, keep the fire going; but some minor improvements, intending to keep the quantities of the three substances named in proper proportion, so as to produce the maximum heat, appear to be the peculiar improvements which made this long-sought process successful.

A small steamer at Pittsburg, Pennsylvania, was recently selected for the test. The small quantity of steam necessary to start the burner in operation was raised by a small wood fire. The oil valve was opened a trifle, as was also the steam valve. The petroleum trickled into the feed pipe, was caught up by the steam, and both plunged into the depths of the fire box, a mass of many tongued, roaring, brilliant flame. As the pressure of steam increased, this flame grew in fury and intense heat, roaring through the entire length of the boiler with a sound like the coming of a thunder-storm. The needle of the steam gauge climbed rapidly up the dial, and in 20 minutes the safety valve blew off at 120 pounds pressure.

The little steamer flew through the water with no sign of smoke from her chimneys, or dirt in her flues. The flame is as easily managed as the steam in the engine.

This method of producing steam is of great interest to all requiring steam power of any kind, on land or sea, and in view of the fact that there is on this coast oil and oil wells, quantities being produced in the southern counties, it may be that this new use will have a tendency to stimulate our resources to a greater production.

THE Alaska fisheries are inexhaustible, and a catch of from 4,000 to 7,000 salmon with one haul of the seine is of common occurrence. Two wealthy San Francisco firms started canneries in Alaska, and last year sent down between 7,000, and 8,000 cases, each containing four dozen one-pound cans.

A New Ore Crusher.

The Huntington Ore Crusher is a new invention, just being introduced, and has attracted great attention from milling experts by its rapid and efficient work. Inside the cylinder, or case, is a grooved die, completely encircling the case. To the center horizontal shaft are secured transverse bars, which have swinging arms pivoted to them. These swinging arms are furnished with crushing balls or rollers, which are caused to impinge on the grooved die by centrifugal action, caused by rapid rotation of the shaft.

Scrapers are attached to the bars carrying the swinging arms, and serve to keep the ore from packing and to stir and throw it up against the dies. The hopper has double openings, so that the ore is fed to the rollers and dies from both sides at once. The bearings of the rollers are constructed in a peculiar manner where they are connected with the swinging arms, so that dust or grit is prevented from entering the journals. Where the driving shaft passes through the sides of the cylinder, the construction is such as to prevent any wear or cutting from grit.

The ore fed in through the double hopper falls on to the beveled edge of the case, and is directed from both sides under the shoes into the groove of the die. The rollers, by the rotation of the shaft, fly out against the grooved dies, and pulverize any material which is in the cylinder. The scrapers do not admit any accumulation of ore at the bottom of the die, but keep it distributed and stir it up so that the rollers are not crowded. The rapid rotation of the rollers and the action of the die distribute the ore in every direction, which, when crushed sufficiently fine, is discharged through screens from both sides.

The centrifugal motion imparted to the crushing balls is such as to keep them in contact with the grooved die for the entire circle, and the flying particles of ore are therefore crushed over and over again, until fine enough to pass the screens. The circle of dies may be removed at any time when necessary. The machine is adapted for either wet or dry crushing, a feature which is novel in this class of machines. The machine makes very little noise in its operation.

The Liverpool Copper Market.

During the month of July Chile bars have reached a lower point in Liverpool than they have ever done before—£53 5 s. for good ordinary brands, representing a fall of £2 10 s. per ton from the 1st of July to Aug. 1st. The chief causes of this depression have been the large charters advised for the six weeks—8,700 tons fine; the failure of a special sale on the 15th, at which 1,146 tons were offered at £60, the highest bid being £58 10 s.; the increase in the stocks of Chile copper, and the small deliveries. The English smelters, however, have experienced an unusually active demand, chiefly for India, though at low prices. The arrivals from Chile in August were 3,405 tons, and the deliveries 2,727 tons fine. From other countries the arrivals in Liverpool have been 2,059 tons.

The latest quotations, as given in James Lewis & Sons' monthly report on ores and metals of August 1st, are—Bars, good ordinary brands, £53 5 s.; best brands, £53 10 s. to £53 15 s.; copper ore 10 s. 6 d. to 10 s. 9 d.; regulus, 10 s. 9 d. to 11 s. per unit.

Chile exports to July 27th, for the year, aggregate 34,691 tons fine, against 29,483 tons during the same time in 1878; 29,653 in 1877, and 32,343 tons in 1876.

Stocks of West Coast produce on hand equal 30,454 tons fine, against 29,776 tons on July 1st, against 22,661 tons on August 1st, 1878, when quotations were £61 10 s. In 1875 stocks were only 13,404 tons, and the price £79 per ton. The Board of Trade (Liverpool) returns for the first six months of this year, in fine copper, show imports of ore, regulus, etc., equal to 48,885 tons, and exports of 31,214 tons.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS

Foundries in Nevada Mines.

EDITORS PRESS:—The wear and tear of machinery in the large crushing mills and heavy hoisting works of the mines, together with the various amalgamating processes and other operations, is necessarily very great; but to send from two to four or five hundred miles for repairs is both expensive and a loss of much valuable time. Hence each important mining district needs a foundry and machine shop if possible. Therefore these enterprises ought to be encouraged by local patronage as far as circumstances permit.

In Tuscarora is one such foundry, small but to appearances doing excellent work, owned by Messrs. Jack, Dowe & Prout. Fine amalgamating pans of three and a half tons and large retorts we saw being cast, which we judged as well done as any we had anywhere seen. At Paradise Valley we found one still smaller, for the Mount Rose and Willow Creek mines, but it was not in good running order. They were hoping for an improvement. Directly on the railroad the needed work can very well be done at San Francisco, Sacramento or Marysville. Reno, and some other places, more especially to the north and west of there, have largely patronized the Marysville foundry, Mr. Ghorum, Superintendent, where on our spring visit we saw some of the very finest work of the coast, done by the largest and most complete machine shop outside of San Francisco and the Sacramento railroad works.

At Virginia City are the largest foundries in Nevada State, of which the Fulton works on the divide towards Gold Hill is the first in every respect. We saw in this foundry the day we were there being prepared the heaviest single casting we were told on the coast, an immense wheel of 15 tons, though one of 17 was soon to be also cast. The work was successfully done.

We never cease to admire the marvelous process of pouring the red liquid mass of iron as easily as so much water, and then the quiet change into the solid fixed form as designed for permanent use. The Creator seems to have arranged all things for man's most convenient manipulations in accordance with his design for usefulness, if only he will study the laws of nature and take advantage of them aright. But in them is found no favor to the ignorant, the willful or the careless.

Near the Fulton foundry are the well managed boiler works of G. E. Belmar, the only steam boiler works we were told east of the Bay, excepting those of the C. P. R. R.

Eureka has two moderate foundries, the largest of which was burned in their great fire, one plainer of $1,200 value being all that was saved.

A Good Prospecting Stamp Mill.

In Silver City we saw what we believe is the best small prospecting mill we have ever known, a new invention patented by Mr. C. P. Stanchfield. It is a revolving hollow cylinder, through which at right angles to the hollow slip the stamps of suitable weight as the cylinder revolves. This consisted of five stamps, thus practically becoming ten by their revolution to fall alternately on each end. Into the hollow cylinder is forced a constant stream of water, which keeps all sand from entering the sockets in which the stamps slip, and also keeps the crushing quartz wet as needed. The stamps not only crush by dropping, but also grind by slipping after the fall as a necessity from their revolving. The only power needed is three-horse power, where usually upright five stamps take ten-horse power, with no more work done. The whole is easily loaded, and then drawn by a four-horse team to any place for use and immediately set for work again.

Fuel for the Mines.

A difficult problem for Nevada State in the near future is that of the fuel supply for its immense mining enterprises. Its limited good forests along its western line, on the eastern narrow slope of the Sierras, is being rapidly swept away, while through its central portion a stranger would think there is none so little is there to be seen. Virginia City with its immediate vicinity consumes in round numbers some 300,000 cords a year, or at 30 cords per acre, 10,000 acres. This in a few years would lay bare all that portion of the Sierra range in Nevada State. But Virginia City is only a part of the mining regions of Nevada. The Eureka and Richmond mills alone, besides all the different hoisting works at the six or seven mines, use up daily and in round numbers 180 cords, *i. e.*, together 360 cords. This is mostly in the form of charcoal hauled in by teams from many miles away for smelting all their ore. This is about 130,000 cords a year. Tybo has used three-eighths as much, or 50,000 cords.

This will, not long in the future, leave the State without a forest in its territory, except the very slowly-maturing second growth. Already sage brush is being extensively used, but this, too, must fail in time. At Lewis its two mills use mostly this brush for fuel at an expense (for one of the mills), we were told, of $34 a day by contract for all they might need, though some five cords of wood were also consumed. At Tuscarora also sage brush was mostly used, though its extensive valley in front is all cleared of this brush for nearly 10 miles away. The second growth comes forward very slowly, taking probably 20 years for maturing. Still, in Tuscarora a large amount of wood has been burned. The Grand Prize even now, at its new hoisting works, alone uses 30 cords of wood a day, at an expense of $17 per cord on the average. As yet no good coal has been found west of Salt Lake and east of the Sierras, though some poor, unused varieties are found in veins of from two to four feet in width near Elko and Battle Mountain, and Dayton, and a few other places. No petroleum has been found, though searched for.

Water in Nevada Towns.

Most of the towns of Nevada have barely water sufficient for household use, and that of the mines. Few have little or any to spare for irrigation, unless at great cost, which families can ill-afford to meet. Hence towns, such as Tuscarora, which with water in abundance could be made one of the most lovely on earth, has but one green growing spot in it, a little circular inclosure nine feet in diameter, in a low out-of-the-way place of the suburbs. This want of water detracts immensely from the loveliness of all the mining villages of the State.

Virginia City is partly an exception in this respect, since the very costly introduction of water from the Sierra range at an expense of over $2,000,000. This is done by a large iron pipe across the head of the Washoe valley, descending and then ascending over 700 feet, thus incurring, at the lowest point a pressure of some 325 pounds to the square inch. Before this improvement water was sold at the rate of $2 the week where a boarding house wished eight pails a day. Now it is sold at about 50 cents a week for all needed for use. Still, at this rate only a little is used for irrigation, though the more wealthy have cultivated some very lovely green dooryards, while fine shade trees are beginning to dot the better portion of the city.

At Eureka are four or five green dooryards, and some small trees. At Tybo none except in front of the company's fine dwelling. Water is here sold at five cents the common pailfull. At Belmont there are three really green, pleasant, irrigated dooryards, no others, though for domestic use water is plenty. This is sufficient for an illustration of the whole. We speak not of the towns on the Humboldt, but of the mining towns of the State. These are all thus scarce of water, while the regions around are as dry as dry can be, desolate, barren, rugged, mountainous, grand and worthlessly magnificent as can well be imagined. S. V. B.

THE MANUFACTURE OF VENETIAN GLASS.—Articles in black glass made in Venice are distinguished from all similar products by the intensity of their black color. The question has often and vainly been asked, what special ingredient has been employed to give the glass this color. M. Kayser, a chemist of Nuremberg, in order to discover this, made an analyeis of a glass known to have been made in Venice, and compared it with black glass, such as is used in the manufacture of Venice beads. This comparison brought out the fact that manganese is the substance employed to give the black color to glass in which it exists. In fact, while white glass contains only 1.80 of manganic oxide, black glass contains 11.39, and that is the only notable difference that the two analyses present. To confirm this result, M. Kayser melted in a small furnace a mixture of sand and sulphur, in which he introduced 15% of peroxide of manganese. He thus obtained a glass of a deep black color; in very fine threads or thin splinters it was of a somber violet. In one word, it exactly presented, in respect to color, the same properties as genuine black Venetian glass.

MAKING PHOSPHIDE OF HYDROGEN.—In preparing phosphide of hydrogen, or "phosphuretted hydrogen," for a lecture experiment, it is common to use potash lye and phosphorus, giving the beautiful smoke-rings when the gas bubbles are ignited. Herr Rosenfeld has lately recommended a simple way of getting the same phenomenon by decomposition of phosphide of calcium with water. A piece of blotting-paper is rolled up to form a tube, and is closed by tying at one end. It is then half filled with powdered phosphide of calcium. In the open end is tied with wire a fine quill with a small opening. The whole is then wound round with wire to prevent lateral escape of the gas. In making the experiment the arrangement is simply placed upon water, care being taken that the quill point dip in the liquid (the quill may be surrounded by a close-fitting glass tube). The water slowly penetrates the blotting-paper, and decomposes the substance enclosed. The phosphide of hydrogen escapes through the quill in bubbles which, on being ignited, give beautiful smoke-rings.

"MANY MICKLES MAKE A MUCKLE."—According to the calculation of Mr. G. T. C. Bartley, an ounce of bread wasted daily in each household in England and Wales is equal to 25,000,000 quartern loaves, the produce of 30,000 acres of wheat, and enough to feast annually 100,000 people. An ounce of meat wasted is equal to 300,000 sheep.

TO BLEACH LINEN.—A teaspoonful of turpentine boiled with white clothes will aid the whitening process. This is due to the formation of hydroxyl.

Montana.

Her Natural Resources—Mineral, Agricultural and Grazing—Varied Fortunes.

Latterly Montana, as a mining country, has been retired to the background, and in this respect hardly met with full appreciation. The causes for this, though varied, have not been peculiar to this Territory, Idaho, and to some extent other of her neighbors, having in like manner been sufferers. Upon the discovery of placers in this region a large population rushed in, and proceeding to work the diggings with the eager energy characteristic of the early placer miner, exhausted the same with great rapidity. For the first eight or ten years following the discovery of gold, business of every kind was active and prosperous in Montana. From almost no white population at all the Territory came to number over 30,000 inhabitants. Thrifty mining camps sprang up everywhere, and several considerable towns were built at eligible sites, some of which have since grown into respectable cities. Attracted by her fine grazing resources, and the markets that existed for beef and the products of the dairy, stockmen from Nevada and Texas drove their herds in by the thousand. Numerous bands of horses were also taken in from California for pack and draft service and the purposes of breeding. Roads and ditches were constructed, fields enclosed and cultivated, saw mills, flour mills, and in due time, some quartz mills and other reduction works were put up; these last coming only after the surface placers had been pretty well depleted.

She Gets a Set-Back and Comes up Again.

With the attempts at working her vein mines, Montana's difficulties began. The gold and silver-bearing ores proved more or less refractory. Labor was high, material of all kinds was costly, and the country without skilled metallurgists and miners. And so the business of working this class of ores failed to meet expectations, and experienced a set-back almost at the start. With this partial failure came a general reaction; trade languished, property depreciated, and a good many people left Montana, which, with all her mineral richness for the time being, passed under a cloud. Latterly this cloud has begun to lift and the prospects of the Territory seem better just now than ever before.

One cause of this improvement is the near approach of a railroad to her borders. In less than a year, the Northern Utah narrow-gauge will have entered Montana, and it will not be long thereafter till it will have been extended to some of her most important mining centers. With the cheapened freights that must ensue, mining, already somewhat stimulated, will receive a great impetus, causing property to appreciate and imparting new life to every other branch of business.

In some respects Montana may justly claim advantages over all her sister Territories. The climate is excellent, considering that the country lies above the 45th parallel. The winters are not severe, nor are the summers extremely hot. There is never much snow in the valleys, though it falls to a great depth on the higher mountains, affording plenty of water for irrigation in the summer, and also a great deal for the propulsion of machinery. While the summers are dry, nearly enough rain falls in the spring and early part of the summer to mature the crops without recourse to the artificial use of water. The natural grasses grow quite plentifully nearly everywhere, and most of the mountains contain more or less timber.

Mines and Mining.

Touching the mining industries and mineral resources of Montana, a correspondent of the New York *Tribune* writing to that paper under recent date, claims for these a special prominence, admitting at the same time that it is doubtful whether the agricultural, grazing or the mineral resources of the Territory are going to ultimately take the lead. Mines of gold, silver, copper, lead, iron and coal have been discovered, says this writer, in every county, the mineral-bearing territory here exceeding in dimension that of any other western commonwealth. This vast mineral wealth, not segregated in one giant fissure like the Comstock, is distributed in hundreds of veins, many of which are now yielding ore so rich that it pays for transportation to the Eastern States and even to Europe for reduction. The total yield of the precious metals in Montana during the past 16 years has been $153,000,000—more than that of Colorado, Utah and Idaho combined. About $147,000,000 of this is in gold, placing Montana only second to California in the production of that metal. Over 20,000 quartz mines have been recorded, and some of the mountain ranges have hardly been the scene of a single bivouac of the prospector.

Montana's Silver Production.

1873	$ 201,300
1874	490,766
1875	660,000
1876	1,132,976
1877	1,250,000
1878	2,250,000

The total mineral yield in 1878 is placed at $6,763,000. Over $1,000,000 were invested in new smelting works, furnaces, mills and other improved appliances, which increase the productive capacity to such an extent that the yield of the mines will be easily increased 25% during 1879. Ores containing from 20% to 60% copper, unlimited in quantity, are found in several districts. There have been on exhibition at Helena ores from 48 different iron mines or deposits running in value from 25% to 80% iron, and representing every conceivable variety of ore. An iron mountain in Deer Lodge county, larger than the famous deposit of Missouri, averages 30% of that metal. Coal beds lie within three miles, and an iron furnace will be built this season. Prof. Hayden and others estimate that from 50,000 to 65,000 square miles of Montana's area are underlaid with coal. Several of the measures are yielding an excellent quality of fuel. Lead ores averaging 75% lead and a proportion of silver are frequent.

Importance of Testing Water Pipes and Pipe Joints.

Testing pipes and pipe joints in the open trenches in which they are laid, forms the subject of a "selected paper" in Vol. 56 of the "Proceedings of the Institution of Civil Engineers," by Mr. M. M. Patersou. The importance and difficulty of securing good pipe conduits has frequently been referred to by hydraulic engineers in discussions upon water works, and it is admitted that a large amount of silent and invisible leakage from the mains accompanies most systems of water supply. Among instances of the evil effects of leaky mains may be cited Liverpool, where the consumption of 117,425 persons was reduced from 32.12 gallons to 15.97 gallons per head per day by the repair of leaks, discovered by the waste water meter system adopted by Mr. Deacon; Vienna, where a special commission was appointed to report upon the failures in the main line of conduit to that city; and Lewes, in Sussex, where an outbreak of fever has been traced to this cause among others. In laying the pipes for the Ossett water works, the whole of the pipes were tested in lengths of from 60 to 500 yards, after jointing in the trench. From the record of these tests an analytical table was drawn up, whence is obtained the following summary, showing the percentage of failures of the aggregate of all sizes: Total joints tested, 7,763; number of failures, 244; percentage, 3.14. Total straight pipes tested, 7,249; number of failures, 104; percentage, 1.43. Total special pipes tested, 514; number of failures, 50; percentage, 9.72. These results are, so far as the pipes are concerned, solely attributable to concealed defects in the castings, discoverable only after calking and while under pressure. The author's conclusions are: 1. That the usual mode of laying cast-iron socketed pipes without testing after jointing, and in the open trenches, does not give sufficient security against leakage. 2. That by such testing the desired security may, in most cases, if not in all, be obtained at no great inconvenience or cost. 3. That all pipes, special pipes included, should, if possible, be tested before leaving the foundry. 4. That the value of the principle of casting pipes with the sockets downward is confirmed, although it affords no absolute security against defective sockets. 5. That systematic testing after jointing will tend to improve the quality of both castings and joints, the cost of each failure being thus largely increased, and falling upon the contractor at fault. 6. That the public will be further secured against accidents to pipe conduits, with their attendant evils, viz., the cost of repairs, the loss of water, the interruption of supply, and the indraft of gas or other foul air at leaky points when the pipes are empty.

CLEANING AND TINNING METAL PLATES.—For the more speedy and economic coating of metal plates with grease and metal Mr. W. Knight, of Pontypridd, proposes to employ revolving or otherwise moving flat surfaces or rings, made of wood, metal, or other suitable material, which may be uncovered or covered with a hard or soft material, according to the special requirements of the operation. He supplies palm oil or other kind of grease to such surfaces or rings by means of hollow spindles or hoppers; he passes the plates to be treated through such surfaces or rings by any suitable means for the purpose of the greasing process, which being concluded they are conveyed through metal and grease to be coated with tin or other metal contained in a corresponding pot. After leaving the pot, he carries the plates through moving or stationary brushes. After passing through the brushing operation, he then carries the plates through metal, and then through grease into the finishing rolls. He puts the required pressure on the finishing rolls by means of spring balances attached to the end of levers, cranked or otherwise. He also employs machines fitted with the before-mentioned moving flat surfaces and rings, as cleaning machines, and proposes using bran or pollard mixed with powdered fuller's earth, the plates being placed in boxes containing fuller's earth working on axles with side openings or doors, the plates remaining a short time in contact with the material before being passed to the machine.

ANTIQUITY OF MAN.—The doctrine that man had existed on the earth only about 6,000 years had been so long believed and so universally accepted that there seemed to be little or no disposition to call its truth in question. But this quiescence has been rudely startled by the announcement that recent research has brought to light human relics and fossils that demand for their explanation a lapse of time amounting, according to some, to tens of thousands, and, according to others, to hundreds of thousands of years.

MECHANICAL PROGRESS.

The Westinghouse Brake.

A very interesting and important set of experiments were carried out some time since on the Northeastern railway with an engine and train of carriages which have recently been fitted with the Westinghouse automatic brake. They were conducted by Capt. Douglas Galton, C. B., F. R. S., under the personal direction of Mr. T. E. Harrison, the Engineer-in-Chief of the Northeastern railway.

The brake apparatus fitted to the train in question is similar in general principle to the most recent applications on other lines. Slight modifications, however, have been introduced into the details, as suggested by matured experience. For instance, the brake pipes are one inch in diameter internally, without bends at the ends of the carriages, instead of being three-fourth-inch pipes with bends, as formerly. The hose couplings have valves so arranged that when unitsd there is a free passage for the compressed air. When they are disconnected in the ordinary way the valves are closed, but when the couplings are drawn apart by the accidental separation of the train the valves are left open. Formerly cocks were used in the brake pipes at each end of the carriages, and these had to be opened or closed by a movement independently of the act of uniting the couplings, so that the working here is greatly simplified. In the next place each carriage is now fitted (although at present only experimentally) with a friction or reducing valve, which is operated by the friction of one of the brake blocks. This valve is an automatic apparatus, the function of which is to prevent the wheels skidding, which is always objectionable in braking a train. In practice, when the pressure upon the brake blocks reaches the point at which skidding commences, this friction valve comes into operation, and at once reduces the pressure below that point. It allows the wheels to revolve, but retains upon them the maximum amount of brake power. The special novelty upon the present occasion was a modified form of triple valve, which is placed on every carriage. By the aid of these valves the driver can admit any degree of pressure into the brake cylinders. So far as present experience has gone, the new form of valve overcomes all the difficulties hitherto encountered in this portion of the apparatus.

Another feature now introduced for the first time is a pressure regulator, which is placed on the engine. This regulator perfectly controls the maximum pressure in the air-reservoir by stopping the working of the pump at any pressure at which it—the regulator—may be set. If, for instance, a pressure of 80 pounds, and no more, is required in the air reservoir, then the regulator, being so set, stops the pump when the pressure has reached 80 pounds.

The only other modification calling for notice is that respecting the leakage valve, which has been superseded by a short groove in the brake cylinder. This groove allows any slight discharge of air from the triple valve, caused by a leak in the main pipe, to escape. If, however, the air enters rapidly, as for setting the brakes, the piston moves past the groove and prevents any escape of air.—*Iron.*

A New Stone Dressing Machine.

Messrs. Brearley & Marsden have patented in England a new machine for dressing stone, the mode of working which is very simple. The stone is operated on its whole width by a number of cutters, which strike it in an oblique direction, the motion at these points being one of scooping, in fact the motion of the cutters is an exact imitation of the movement of a mason's chisel when worked by hand. Motion is given to these cutters by means of a number of eccentrics cast on the driving shaft and carried on a strong cast-iron frame, which can be raised or lowered by means of a hand wheel and screws to regulate the depth of cut. Each eccentric is set at a different center on the driving shaft, so that only one cutter strikes the stone at the same time, thus causing greater regularity of working and economy of power; six horse-power, we understand, being quite sufficient for driving the machine. The cutters used either for molding or plain work consist simply of small plates of steel about ½-inch thick, whilst in plain work for most kinds of stone thin sheets of steel 1·16 inch thick can be used. These require very little sharpening, the thinnest cutters practically sharpening themselves, as one edge becomes sharp whilst the other is wearing, all that is then necessary being to turn the cutter round, and for cutting moldings it is only necessary to use cutters of the shape required to make the mold. In order to produce the best class of work from rough hewn stone at the quickest rate, some of the machines are made with a patent arrangement, by which two sets of tools can be worked from the same eccentrics, and as one set is brought to operate on the stone, the other set is moved out of the way. In this apparatus the frame which carries the eccentrics is made in the form of a quadrant, which can be swung from the center of the eccentric shaft, into any position, by means of a hand-wheel working a pinion in a toothed segment, one set of cutters being carried on the point of radius of the quadrant, and the other on the back radius, so that when the quadrant is swung into such a position that the cutters in the back radius work on the stone, those on the front radius are at the same time raised clear of the work. Excellent specimens of the work done by the machine are exhibited. One machine of the size to take in four feet wide, and nine feet long is capable of working as much as 400 superficial flags or landing per day, at a cost of less than one-fourth of which it would be if worked by hand.

Compound Locomotive Engines.

M. Anatole Mallet, a well-known French railway engineer, has shown practically that the compound system is peculiarly advantageous with locomotives, for which steam jacketing cannot perform the good work it does with stationary engines, which may be supplied with delicate cut-off gears for high expansion, none of which have been able to stand the test of practical working when applied to locomotives. The compound system admits of using in each cylinder only moderate degrees of expansion, such as are very readily obtained with single slide valves, worked by the ordinary kinds of link motion. M. Mallet designed a locomotive differing as little as possible from the ordinary type, the small and large cylinder being connected by a special contrivance, enabling the engine to work at any time with direct admission and exhaust to both cylinders. They were first tried on the Biarritz and Bayonne railroad with six-wheeled tank engines. The consumption of coal for the average of one year's working was 0.206 pounds per mile per ton. An improvement was introduced in the engines built for the Haironville and Triaucourt narrow-gauge road, the object of which was to prevent the considerable drop of pressure occurring between the two cylinders, owing to the capacity of the intermediate chamber or receiver. It was necessary also to provide an arrangement for cutting off to best advantage in both cylinders, instead of making the expansion equal in both. M. Mallet has also added a self-acting reducing valve, with the purpose of keeping the power equal on both sides of the engine, and of preventing the total pressure on the area of the large piston, replacing a smaller one in remodeled engines, from endangering the working parts retained and originally designed for a given pressure only. In compounding existing engines, M. Mallet generally retains one of the original cylinders as the high-pressure cylinder, and replaces the other by a new one of larger dimensions for expanding.

New Electro-Magnetic Motor.—*La Lumiere Electrique* says that M. Marcel Deprez has succeeded in devising an electro-magnetic motor capable of doing useful work in many industrial applications. Deprez's apparatus is barely eight inches long by less than six inches in breadth. It weighs about six and one-half pounds, and can supply a power of nearly eight-foot pounds per second with five Bunsen elements. This is considered an extraordinary result, and one which could scarcely have been anticipated a few years ago. Under these conditions sewing machines may be worked by electricity without any cumbrous apparatus. This ingenious system consists of a horse-shoe magnet of eight plates, five and three-quarter inches in length, between the poles of which is introduced a Siemens armature, acted upon by the magnet over a length of two and three-quarter inches. The electro-magnetic armature, instead of being placed transversely to the magnet, is arranged longitudinally and parallel to it. Under these conditions the magnetic power is found to be considerably augmented. The axis of the electro-magnet is parallel to the coils of wire in the magnetizing helix, and, consequently, to the arms of the magnet. At one end it carries a reversing commutator, and at the other end it is provided with a pinion which gears into a wheel, of which the diameter is 30 times greater. When the apparatus is properly regulated, the armature makes 90 revolutions per second, and, consequently, the wheel which it acts upon makes three revolutions. It is upon the axle of this wheel that are fixed the pulleys transmitting the movement, and by which the engine is caused to work either a sewing machine or any other apparatus that is to be set in motion.

The New Telephone.—The French government has granted the first concession ever made by it for running telephonic wires to Mr. Frederick A. Gower, of Providence, R. I. Hitherto the telephone has not been used in France, the commissioners appointed by the Telegraph Department to examine existing systems not being satisfied with them. The currents in Gower's telephone are generated by a magnet strong enough to allow a battery to be dispensed with. The increased power is gained by abandoning the horse-shoe form. It is shaped in a half-circle, with two arms bent into the center, where they nearly touch each other. Signaling is effected by blowing through a reed like that of a parlor-organ, this reed being cased in a tin tube and passing under the diaphragm, near the poles of the magnet. Superfluous vibration, the cause of indistinctness, is thus dispensed with. The vibration in the reed sets up an intense vibration in the diaphragm, which transmits a magneto-electric current to the receiver, producing a clear, loud note. The speaking-tube is then taken up, and the voice is heard distinctly. The diaphragm and magnet are incased in a small metal box, from which the reed emerges. A company is forming in Paris to carry out the invention. Applications for its use are coming in from all quarters.

SCIENTIFIC PROGRESS.

The Manufacture of Soda, Potash, Etc.

Of late years a great change has taken place in the mode of producing sodas and potash. Not so very long ago the alkaline salt potash was obtained principally from refuse and worthless materials. Thistles, potato stalks, and such like were burnt, and the salt contained in the ashes from them was dissolved by the admixture of water. The water being allowed to evaporate, what remained was potash. When to this was added nitric acid we obtained saltpeter. The latter was frequently found in minerals along with nitric acid, but still more, was formerly made from the dunghill, where the refuse being left to rot in the open air the liquor from it was filtered and crystallized. But now potash is made from waste salts, and in Germany there are large manufactories for its production from such, whilst it is also made from chloride of potassium. At Stassfurt and Leopoldshall the potash is produced from the variegated bitter salts, which are found lying above the rock salt. In addition to the ordinary purpose for which potash is used, it is made so as to become a good manure, being mixed with sulphate of magnesia and salt. The manufacture in Germany finds employment for some thousands of persons in the works and the mines connected with them. Another alkaline salt, sal-ammoniac, frequently used by ladies in their smelling bottles, was formerly obtained from the refuse of the stable, being formed by the union of two aeriform bodies, carbonic acid gas and ammoniacal gas, the result of animal and vegetable matter in a state of putrefaction. But it is now made from salt similar to potash, and manufactured rather extensively in Germany, as well as alum, which is used for so many purposes. When reduced with common salt to an impalpable powder, and mixed with spirits of wine, a quantity of it put on the hand will make the latter impervious against a red-hot poker. Soda is now largely manufactured in Germany in connection with potash. There are several processes that have been tried from time to time, and chloride of soda has been turned into soda by bi-carbonate of ammonia, but the process known as Cehlanc's is that most generally adopted, being by a succession of reactions. From the refuse left, and in the manufacture of soda, we have hyposulphide of soda. The lye that is left from the soda contains a good deal of sulphide of calcium, and having added to it sulphate of soda there is sulphate of lime; which, being taken away, leaves the hyposulphide of soda brought to perfection by crystallization.

With respect to the great European salt deposits, the theory is that they owe their origin entirely to the elevation of the mountain chains with which they are so intimately connected, and during which small valleys and ravines would be cut off from connection with the sea by ridges of land, and would form salt lakes and lagoons. In England there are extensive deposits of salt and brine springs, those of the latter, in Cheshire, are mentioned in the Doomsday Book. Camden remarks, with respect to one of them, that there was a stair about it, down which half-naked men went to draw the brine in leathern buckets, and then carried it to the wich houses. There does not appear to be any reason why the brine, or at least some of it, found in our English salt mines should be capable of producing the same potashes and sodas as are manufactured so successfully and profitably in Germany. The system adopted of using the rock forming the upper parts of rock salt beds seems to be simple, and the same as used to be adopted by Hermann and others in preparing the ordinary leach-brine of saltworks. However, we are not aware of there being any soda and potash manufactory in this country, although it is an important industry abroad.

Gas-lit Buoys.

That the buoys which mark channels and wrecks are sometimes destroyed or displaced by vessels running along the coast on dark nights is well known. After two trials of lighted buoys, therefore, the Trinity Board has resolved upon sending a buoy, of which the lantern can be kept continuously burning, to a station off Dundee. The first of those trials took place in August last at the Trinity wharf, when the light lasted uninterruptedly for 28 days. Water was pumped upon it from a steam engine, to see what would be the effect of the shock and drenching, and no harm was done. The buoy was then sent down to the Nore, and there burned steadily for 24 days. The same buoy has now left London for its appointed place at Dundee. Provision has been made for keeping it alight without any interference for 34 days.

It is a buoy of most awkward construction, but this does not lessen its usefulness, and others are being more skillfully made to receive the same illuminating apparatus. This is a modification of what is known as Pintsch's compressed gas system, which was first brought out in Germany. It is proposed to make the buoy itself the recipient for containing the compressed gas, with its regulator (which is one of the most important parts of the invention), and the lantern at the top of a short conducting tube. A buoy of ordinary size will burn about three months night and day, with only one filling, and the light is visible at a distance of about four miles. There is, however, in existence an electric lighting apparatus which might be employed, so that the light could be extinguished at sunrise and restored at sunset, giving, of course, a much longer duration to the working of the buoy.

Utilizing Iron and Steel Shearings.

Thin shearings, or pieces of iron and steel—such, for example, as the scrap from cutting iron sheets for tin-making, and from various other operations in which thin sheet iron or steel is employed—are very frequently reworked with other metals, either in the puddling furnace or in the refining furnace. In some cases the scrap is placed loose in the puddling or refining furnace, but more commonly it is made into bundles. In any case the binding only serves to keep the material together while heating up, for the bundle then falls apart, allowing the metal to mix with the remainder of the charge upon the bed or hearth of the furnace. There is much loss in this process of reworking, 30 cwt. of this scrap not producing more than a ton of manufactured metal. According to the invention of Mr. J. H. Rodgers, of Llanelly, England, the shearings or waste pieces of thin iron or steel are compacted together into masses or blocks, and these are placed in a re-heating furnace, and when heated to a proper temperature, are consolidated under a steam hammer, or in any other convenient way. In this manner he can obtain a ton of manufactured metal from 23 cwt. of shearings. In order to form the shearings or pieces of iron or steel into masses or blocks ready for heating, he places them in a box or mold, and with a steam press or other suitable machine he presses the contents of the box or mold until a compact block is obtained. The mass thus compacted is withdrawn from the box by an opening provided for the purpose, and which is closed by a door while the material is being molded. The compacting of the scraps is performed in a cylinder or mold, wherein they can be compressed by a kind of steam hammer. To discharge the molded mass, the box is opened and by means of a bar inserted at a suitable hole it is forced out in a condition to go into the re-heating furnace. In the furnace, and in the subsequent hammering, the blocks or masses are treated in the same way as piles or blooms.—*Phila. Trade Jour.*

Smoke of an Electric Lamp.—Prof. B. S. Proctor, to whom was referred the sooty deposit on the inside of a glass globe used with an electric lamp, says, in the *Chemical News:* "Under the microscope the smoky deposit on the glass showed numerous bright globules, no doubt platinum, and more minute particles of dark matter, nebulous under a ½-inch objective. A fragment of the glass exposed to an oxidizing heat, the deposit partially disappeared, still leaving the glass slightly darkened. The platinum support—which had also a coating of dark sublimate at a little distance above and below the carbon pencil, but not in immediate juxtaposition with it—was next examined by exposing to the blowpipe flame the unsmoked portion, so that the conducted heat might act upon the deposit without the fear of the blast carrying away the matter, which was very loosely attached. In this way the deposit was burnt off without the mechanical action of the blast, the heat to which it had been subjected being that of dull redness. A piece of the glass was then treated with aqua regia for several days. The deposit was diminished, but far from being entirely dissolved; the solution gave a blue reaction with yellow prussiate of potash, and no coloration with tannin till aided by vapor of carbonate of ammonia, when the usual purple color of ferric tannate was developed. There is thus evidence of the deposit containing platinum, carbon and iron. Probably the scattering of platinum globules might result from the disruptive discharge which took place at the moment of the lamp breaking down.

Prehistoric Stone Implements.—It has been supposed that the stone implements, especially the flint spears and arrow-heads used by the prehistoric inhabitants of Europe and America, were made by chipping off fragments from a piece of suitable size with a rude stone hammer. Mr. Cushing, curator of the Anthropological Museum of the Smithsonian Institution, who has made a very interesting experimental study of aboriginal processes of manufacture, found it impossible, by using the rude implements that were within the reach of the ancient manufacturers, to imitate, by chipping with a stone hammer, the finer and more delicate specimens of Indian arrows. He accidentally made the interesting observation, that small fragments could be broken off from a piece of flint with much greater precision and certainty by pressure with a pointed rod of bone or horn than by blows with a stone hammer. Mr. Cushing was enabled in this manner to "flake" spear and arrow-heads into the most delicate and fragile shapes, with a degree of certainty that renders it almost equivalent to demonstration that this was the mode adopted by the aborigines for working flints before the introduction of iron.

Nickel.—It is known that nickel, like iron, is magnetic, sufficiently ductile to be forged and drawn into wire. Its point of fusion is very high, and if melted in the proper kind of crucible it yields a homogeneous regulus of a silvery whiteness containing carbon.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending July 31		Week Ending Aug. 7.		Week Ending Aug. 14		Week Ending Aug. 21	
Alpha	25¼	19	25¼	20	24¼	22¼	25	23
Alta	7⅜	6¼	7⅜	6¼	6⅞	6½	7½	6½
Andes	1	80c	1.30	90c	1.30	1	1.15	1
Alps	....	....	....	....	....	....	....	....
Argenta	1¼	1	1¼	1.05	1¼	1	1.05	80c
Atlantic	....	....	....	....	....	....	50c	40c
Aurora Tunnel	50c	....	25c	....	....	....	....	....
Baltimore Con	....	....	....	....	....	....	....	....
Belcher	4.30	3.95	4.90	4.10	4.65	4	4⅜	3⅞
Belmont	40c	30c	70c	40c	95c	70c	95c	90c
Best & Belcher	17⅝	16	19	16½	18¼	18	19	18
Bullion	5⅜	3.95	6⅝	5¼	7	6	6⅝	6¼
Bechtel	1.60	1¼	1.40	1¼	1.60	1¼	1½	1¼
Belle Isle	4.40	3¾	4¼	3¼	3.70	3⅜	4	3.55
Bodie	14	11	13¼	11⅞	11⅞	10	11⅝	10⅞
Benton	4½	3¾	4.70	3.60	4.15	4	4½	3.70
Bulwer	9	8¼	9½	8⅞	9¼	9	9	8½
Boyle	....	....	....	....	....	....	....	....
Black Hawk	95c	75c	1.55	1.35	1.60	1.30	1.30	1¼
Belvidere	1	95c	1	85c	1¼	90c	1¼	1
Booker	90c	50c	1¼	1.05	1¼	1	1.20	1.15
Caledonia	2.20	2	2¼	2.05	2.30	2.05	2¼	2
California	4.95	4⅜	5¼	4.80	5¼	5	5¼	4½
Challenge	2¼	2.15	2⅜	2¼	2.60	2¼	2.60	2⅜
Chollar	6⅝	5⅞	7¼	6	7¼	6⅞	7	6½
Confidence	11	10	12⅜	10⅞	12¼	11⅝	11⅞	11
Con Imperial	1.40	1.15	1.60	1¼	1.55	1.30	1.60	1.40
Con Virginia	4.70	4.60	5⅜	4.60	5⅜	5	4⅞	4.55
Crown Point	4.40	4	5¼	4.40	4.80	4⅜	4.70	4¼
Con Washoe	....	....	....	....	55c	50c	75c	55c
Champion	70c	50c	55c	50c	50c	40c	50c	40c
Concordia	....	....	....	....	....	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	15c	....	....	....	....	....	....	....
Daney	....	....	2½	....	....	....	....	....
Day	20c	15c	15c	....	30c	....	....	....
Eureka Con	15	14⅝	15	14½	15	14½	16	14⅞
Exchequer	5⅝	5	6¼	5½	6⅛	6	6⅝	6⅛
Endowment	....	....	40c	....	....	....	45c	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	3⅜	3.60	3⅜	3.55	4	3.90	3.90	2.90
Gila	1¼	1⅛	1.40	1.20	1½	1.30	1½	1¼
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	14	13	13	12½	14	13	13⅞	13.
Goodshaw	40c	25c	40c	30c	55c	25c	45c	....
Gould & Curry	9¼	8¼	11¼	8⅞	11⅝	9⅝	12½	11¼
Hale & Norcross	13	10⅞	15¼	11⅝	14½	13½	14½	13¼
Hillside	....	....	1½	....	1	....	1.40	1
Highbridge	20c	....	....	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	15c	....	20c	15c	15c	....	15c	....
Independence	2.15	1.10	3	2.30	2.90	2.35	2.60	2.10
Julia	2.95	2.55	3.10	2¼	5	4¼	4.55	4.10
Justice	4.20	3.60	4.10	3.60	3½	3.35	3.65	3.10
Jackson	3⅞	....	4	3½	4½	4¼	5	4½
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	....	....
Kentuck	4½	3.90	5½	4	5⅛	4.45	5	4½
Kossuth	20c	10c	25c	20c	25c	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	1.30	95c	1.15	1	1.05	80c	1	55c
Lady Wash	1.40	1.15	1½	1⅛	1.35	1.15	1.30	1.10
Leopard	1.40	1	1.15	1	1.20	1	1	40c
Leviathan	40c	30c	40c	30c	45c	25c	40c	25c
Leeds	75c	....	75c	70c	75c	....	75c	70c
Lee	....	....	....	....	....	....	....	....
May Belle	30c	....	....	....	....	....	....	....
Modoc	1	....	1	90c	1	....	1¼	1.15
Manhattan	2¼	2	2¼	2	2	1⅞	3	2
Martin White	6	5¼	4	3½	4	3	3.70	3
McClinton	1⅛	1	1.10	1	1	70c	1	75c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	24⅞	20¼	33⅞	21½	32¼	27	36⅞	32
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	3	....
North Con Virginia	9½	9	9⅜	9	9	....	9⅛	9
New York	50c	40c	40c	35c	90c	75c	90c	70c
Northern Belle	4.40	4.15	4.40	4	4.40	4	4¼	4
New Coso	....	....	....	....	....	....	....	....
Navajo	40c	35c	30c	....	35c	25c	30c	....
Occidental	90c	80c	1.05	90c	2	1	1.55	1.30
Ophir	35½	29½	36¼	30½	37	35	38	35
Oriental	45c	10c	50c	25c	70c	35c	70c	35c
Overman	9¼	8	10⅞	6¼	9½	9	9⅞	9
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	2⅜	....	....	....	....	....
Phil Sheridan	45c	....	80c	35c	70c	50c	60c	40c
Potosi	4½	4.05	5⅜	4.05	5⅞	4.60	5⅛	4.70
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	4	3.90	3⅜	2½	3⅜	3	3⅜	95c
Richer	55c	50c	45c	25c	50c	30c	25c	10c
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	75c	55c	45c	....
Savage	12	10½	13⅞	10⅞	13¼	12¼	14	12⅝
Seg Belcher	....	....	....	....	25	23	....	....
Sierra Nevada	40½	31¼	51¼	37	45¼	40¼	49½	39¼
Silver Hill	1¼	1¼	1.40	1¼	1⅞	1¼	1⅞	1.60
Silver King	6⅞	6½	6¼	6	6	5½	....	....
Silver Prize	20c	....	20c	....	20c	....	25c	10c
Succor	15c	....	....	....	....	....	....	....
Summit	2.05	1⅞	1.90	1⅞	2	1.65	2	1⅞
Scorpion	1.90	1⅓	3	1.95	2.50	2	2.95	2.40
Solid Silver	25c	....	....	....	....	....	....	....
South Bodie	25c	15c	20c	15c	20c	15c	35c	10c
South Standard	20c	15c	20c	....	15c	....	15c	10c
Star	....	....	55c	50c	50c	40c	45c	40c
St. Louis	....	....	....	....	....	....	....	....
Syndicate	6	5¼	6⅞	6	6	5⅛	6⅞	4¼
Tioga Con	4	3.10	4⅜	3.10	4.05	3.90	3.95	3½
Tiptop	1	75c	1.10	95c	1.05	95c	95c	....
Trojan	10c	5c	25c	5c	30c	5c	30c	25c
Union Con	35	26½	57	27½	53	45	67½	47¼
Utah	16⅞	14	20,	14⅞	19⅞	13	22⅝	18¼
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.40	1.05	2	1	2.05	1.65	2	1⅞
Wells-Fargo	....	....	20c	15c	20c	10c	15c	10c
Woodville	50c	35c	50c	45c	60c	40c	50c	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	16½	14¼	19⅞	15⅞	18⅜	16⅞	17⅝	16⅝

Sales at S. F. Stock Exchange.

Friday A. M., Aug. 15.
110 Alpha 25@24¼
475 Alta 7½@7¼
205 Andes 1.10@1.15
230 Bullion 6½@6⅝
1070 Belcher 4.20@4¼
225 Best & Belcher 19
540 Benton 4½
1050 O Dorado 1.60
130 California 5¼
2105 Con Imperial 1.55@1.60
235 Crown Point 4.70@4.60
70 Confidence 11⅞
265 Caledonia 2.20@2¼
610 Con Virginia 4.60@4.55
195 Chollar 6¾
100 Challenge 2.60
300 Con Washoe 55c
165 Exchequer 6½
500 Flowery 50@55c
835 Gould & Curry 12¼@12½
190 Hale & Nor 14¼@14½
385 Julia 4.55@4½
490 Justice 3½@3.35
30 Kentuck 5
855 Lady Bryan 90c@1
300 Leviathan 30c
275 Lady Wash 1.30@1¼
945 Mexican 36½@36⅞
420 Mackey 1.45@1½
100 Mt View 2.60@2¼
625 N Bonanza 1.40@1½
30 North Con Vir 9
250 New York 80@85c
290 Occidental 1½@1.55
110 Overman 9½@9¼
275 Ophir 37⅞@38
130 Potosi 5
230 Savage 14@13⅞
715 Scorpion 2.95@2¼
350 Silver Hill 1⅞
1565 Sierra Nevada 48@49½
500 Senator 20c
350 S Utah 5@10c
270 Utah 22½@22
1410 Union Con 63@67½
25 Ward 2
100 Wells-Fargo 10c
350 Yellow Jacket 17⅞@17⅛

AFTERNOON SESSION.
2720 Argenta 1@1.05
600 Adenda 50@45c
800 Belmont 1
1000 B Chief 65c
300 Boston 1.35
50 Black Hawk 1.30
700 Booker 1.15
110 Belvidere 1
220 Bulwer 9@8⅞
190 Bodie 11⅝@11½
100 Bechtel 1.30
950 Belle Isle 4
250 Champion 40c
175 Caledonia (B H) 2¼@2½
70 C Pacific 7
150 D Standard 75c
200 Defiance 75c
270 Dudley 1½
110 Eureka Con 15@14⅞
695 Gila 1.40@1½
220 Grand Prize 3.90
800 Hillside 1@1.10
500 Independence 2½@2.60
50 Jackson 4½
155 Jupiter 2@2.10
100 Leopard 1
425 Mammoth 8½@8
500 Martin White 3
1200 Manhattan 2
315 Mono 9½@9⅞
100 McClinton 1
300 Modoc 1.15
150 Mt Diablo 4⅞
100 Navajo 30c
1500 N Belle Is 50c
450 Noonday 3.90@4
350 N Noonday 2.95@3
90 Northern Belle 4
100 Orient 25c
1480 Oriental 60@70c
250 Paradise 2@2.10
70 Queen Bee 65c
415 Richer 10@25c
150 Rough & Ready 45c
330 Ray'd & Ely 3⅞@4
25 Real Del Monte 2⅛
550 S Bulwer 70@75c
200 S Standard 15c
400 S Bodie 10@15c
235 Syndicate 5@5½
250 Summit 1⅞
50 Star 45c
150 Silver Prize 10c
625 Tuscarora 5@10c
890 Tioga Con 3.95@3.60
200 Tiptop 95c
200 University 40c
150 Vortex 65c

Saturday A.M., Aug. 16.
120 Alpha 24@24¼
265 Andes 1.10@1.05
205 Alta 7½@7⅜
110 Argenta 1.05
565 Belcher 4.10@4¼
480 Best & Belcher 18¼@18
330 Bullion 6½
225 Benton 4.40@4.30
2650 Belle Isle 4@3.80
120 Bodie 11½@11¼
100 Bechtel 1½
205 Bulwer 8½@8⅞
250 Booker 1.20@1.15
350 Boston 1.30@1.35
350 Crown Point 4.55
300 Con Virginia 4.60@4.65
225 Chollar 7@6⅞
50 Confidence 11@11¼
550 California 4½@4.60
965 Con Imperial 1.45@1½
310 Caledonia 2.15@2.10
200 Con Washoe 55c
250 C Dorado 1½
200 Crœsus 25c
50 C Pacific 7½
715 Dudley 1@1⅛
320 Exchequer 6⅛
45 Eureka Con 16
4·0 Flowery 55@50c
130 Gould & Curry 11⅞@11¼
315 Gila 1.45@1½
245 Grand Prize 3.90@3.80
150 H & Norcross 14½
200 Hillside 1.15
100 Independence 2.55
490 Justice 3.40@3.60
270 Julia 4.30@4.40
50 Jackson 4½
300 Jupiter 2@2.10
215 Kentuck 4.95@5
320 L Wash 1¼@1.30
250 L Bryan 95@90c
100 Leopard 70c
900 Mexican 34@35½
530 Mammoth 8@7½
115 Morning Star 3
260 Mackey 1.40
45 Manhattan 3
100 Mountain View 3⅞
300 Mt Diablo 5
300 Modoc 1¼
100 McClinton 65c
185 Mono 9⅝
430 New York 80@85c
30 North Con Vir 9
355 N Bonanza 1½@1.30
1020 N Belle Is 50c
220 Noonday 4
1300 N Noonday 3
160 Ophir 35½
100 Occidental 1.40
35 Overman 9¼
1750 Oriental 60@55c
300 Orient 25c
450 Potosi 4.80@4.90
50 Phil Sheridan 40c
50 Plutus 1⅞
210 Paradise 2.10
150 Queen Bee 65c
10 Raymond & E 3⅞
140 Savage 13¼
715 Sierra Nevada 46½@45¼
100 Silver Hill 1.65@1⅝
625 Scorpion 2¼
650 S Utah 10@5c
100 Star 40c
150 Summit 1.90
125 Syndicate 5@4½
100 S Bodie 10c
900 S Bulwer 85@90c
100 Trojan 30c
170 Tioga Con 3½
105 Utah 21
1080 Union Con 62@60¼
300 Vortex 60@65c
130 Ward 2@1.90
480 Woodville 50c
30 Wales 6
265 Yellow Jacket 17⅞@17⅛

Monday A. M., Aug. 18.
100 Andes 1.05
200 Atlantic 50c
390 Alta 7½
40 Alpha 24½
265 Belcher 4.10@4
605 Benton 4.35@4.15
595 Bullion 6⅝@6½
180 Best & Belcher 18½@18⅜
445 California 4.55@4.60
20 Confidence 11¼@11½
120 Crown Point 4⅞
380 Con Virginia 4.70
200 Chollar 6⅞@6⅞
1750 Con Imperial 1.45
1750 C Dorado 1¼@1.30
200 Con Washoe 50c
400 C P Ravine 30c
110 Caledonia 2
150 Exchequer 6½
115 Flowery 50@55c
515 Gould & Curry 12@11⅞
220 Hale & Nor 14½@14⅝
145 Julia 4½@4.40
390 Justice 3½@3.65
10 Kentuck 4.80
310 Lady Bryan 90@60c
50 Leviathan 40c
1545 Mexican 35½@36
800 Mackey 1.40@1½
30 North Con Vir 9@9½
230 N Bonanza 1.40@1⅛
350 New York 80c
100 Occidental 1.40
290 Ophir 36
120 Overman 9½@9⅞
900 Phil Sheridan 60c
510 Potosi 5@5½
200 Plutus 2
50 S Utah 10c
345 Scorpion 2.80@2⅞
480 Sierra Nevada 42@43½
195 Savage 12⅝
50 Silver Hill 1.70
1110 Union Con 59½@58¼
90 Utah 21@20½
1100 Wells-Fargo 15@10c
465 Ward 2@1.95
145 Yellow Jacket 16⅞@17

AFTERNOON SESSION.
350 Adenda 50@45c
1600 Argenta 1.05@1
325 Belmont 1
500 B Chief 60c
460 Boston 1.35@1.40
520 Booker 1.20
100 Black Hawk 1¼
200 Belvidere 1
170 Bodie 10⅞
420 Bechtel 1.30@1¼
1600 Belle Isle 3.70
500 Champion 45@50c
50 Crœsus 20c
100 C Pacific 7@7½
150 Dudley 1
85 Eureka Con 15⅞
850 Gila 1.40@1.45
150 Goodshaw 45c
790 Grand Prize 3⅞@3½
720 Hillside 1.20
50 Hussey 15c
365 Independence 2½@2.45
400 Jupiter 2.35@2¼
550 Leopard 65@40c
910 Mono 9⅞@10
125 Mammoth 8@7½
620 M White 3¼
100 McClinton 75c
200 Modoc 1¼
120 Manhattan 2.80@2⅞
360 Mt Diablo 5
750 N Belle Is 45@50c
145 Northern Belle 4
1005 Noonday 3½@3⅞
1200 N Noonday 3@2.90
900 Oriental 60@55c
500 Orient 25c
700 Paradise 2@2.10
400 Queen Bee 60@65c
55 Real del Monte 2½
120 Raymond & Ely 3.80@3⅞
1200 S Bodie 35c
750 S Bulwer 85@80c
80 Summit 2@1.90
320 Syndicate 4⅞
700 Silver Prize 20c
25 Tuscarora 10c
150 Tioga Con 3.65@3½
1000 University 40c
500 Vortex 75c

Tuesday A. M., Aug. 19.
15 Alpha 23½@23¼
120 Alta 7½
225 Andes 1.05@1
315 Benton 4.20
360 Bullion 6½
740 Belcher 4@3.80
275 Best & Belcher 18½@18⅞
10 Confidence 11½
725 Con Imperial 1.45
400 Crown Point 4½@4.30
535 Con Virginia 4⅞
30 Chollar 6⅞
155 California 4.65@4.60
650 Con Dorado 1.30
100 Con Washoe 60c
300 C P Ravine 30c
170 Caledonia 2.10@2.05
110 Exchequer 6⅝
1170 Flowery 55@50c
70 Gould & Curry 11⅝
165 H & Norcross 14
145 Julia 4.40
660 Justice 3½@3.55
30 Kentuck 4⅞
770 L Bryan 70c
820 Lady Wash 1.30@1¼
50 Leviathan 40c
895 Mexican 35½@36
415 Mackey 1.30@1¼
40 North Con Vir 9
190 N Bonanza 1.40@1⅜
515 New York 80c
210 Occidental 1.40@1.30
145 Ophir 36½@36¼
35 Overman 9@9½
100 Potosi 5
300 Phil Sheridan 60c
650 S Utah 5@10c
130 Savage 13⅞@13½
575 Scorpion 2.80
115 Silver Hill 1.60
960 Sierra Nevada 42½@43
100 Trojan 25@30c
1050 Union Con 59@57½
120 Utah 20⅞@20½
720 Ward 1.85@1.90
600 Wells-Fargo 10c
65 Woodville 50c
310 Yellow Jacket 16½@16⅞

AFTERNOON SESSION.
1250 Argenta 90c@1
500 Addenda 50c
600 Boston 1.35@1.40
470 Booker 1.15
100 Black Hawk 1¼
130 Belvidere 1.15@1¼
15 Bulwer 8⅞
335 Bodie 11¼@11
250 Bechtel 1.30@1¼
1965 Belle Isle 3.60@3.55
200 Belmont 95c
100 Champion 50c
200 Caledonia (B H) 3½
100 C Pacific 7@6½
100 Dudley 1⅛
200 Defiance 50c
500 Endowment 45c
20 Eureka Con 15⅞
630 Gila 1.45@1.35
300 Golden Terra 13
410 Grand Prize 3½
185 Hillside 1¼@1.35
800 Independence 2.40
100 Jackson 4½
425 Jupiter 2½@2.60
50 Leeds 75c
7660 Leopard 40@70c
600 Martin White 3½
10 Mammoth 7⅛
350 McClinton 75@80c
450 Mono 9⅞@10
50 Modoc 1.20
100 Mt Diablo 5
185 Manhattan 2⅜
160 Northern Belle 4
25 Navajo 30c
1750 N Belle Is 45c
200 Noonday 3.80@3⅞
400 N Noonday 3
250 Orient 25c
300 Oriental 50@45c
825 Paradise 2¼@2.20
650 Queen Bee 60c
50 Richer 20c
250 Raymond & Ely 3.60@3⅞
20 Real del Monte 2⅛
1400 S Bulwer 80c
200 South Standard 10c
150 S Bodie 35c
570 Syndicate 6⅞@6½
400 Silver Prize 20@25c
100 Summit 1⅞
470 Tioga 3½@3⅞
100 Tuscarora 5c
100 Vortex 65c

Wed'sday A.M., Aug. 20.
90 Alpha 23@23⅞
200 Alta 7½@7
50 Atlantic 40c
450 Andes 1.05@1
305 Bullion 6½@6⅝
115 Best & Belcher 19@18½
485 Belcher 3.95@3⅞
185 Benton 4.20@4.15
200 Con Dorado 1.45
50 Con Washoe 75c
250 C P Ravine 30c
535 California 4.65@4.60
285 Con Virginia 4.70@4.60
50 Chollar 6⅝
80 Challenge 2⅜
340 Caledonia 2.05@2
300 Con Imperial 1.45
415 Crown Point 4½@4.30
455 Exchequer 6⅜@6½
250 Flowery 50@55c
170 Gould & Curry 11⅝@11⅞
180 Hale & Nor 13⅝
205 Julia 4.35
250 Justice 3½@3.35
70 Kentuck 4⅞@4½
725 Lady Bryan 70@65c
220 Leviathan 30c
50 Lady Wash 1.15
1790 Mexican 35@34⅞
100 Mount View 2.60
130 Mackey 1.20@1¼
300 N Bonanza 1.40@1⅜
355 New York 80@90c
640 Ophir 36½@37
220 Occidental 1.40@1.30
20 Overman 9¼
150 Phil Sheridan 55c
30 Savage 13½@13¼
365 Silver Hill 1⅞@1.70
290 Scorpion 2⅞@2.70
1100 S Utah 5c
180 Sierra Nevada 41½@42
200 Trojan 25c
70 Utah 20
575 Union Con 55½@55
380 Woodville 50c
400 Wells Fargo 10c
505 Ward 1.85@1.80
105 Yellow Jacket 16⅞

AFTERNOON SESSION.
575 Argenta 80@85c
1650 Addenda 50c
775 Boston 1.35@1.30
300 B Chief 65c
440 Booker 1.15@1.20
245 Black Hawk 1½
270 Belvidere 1.15@1
200 Bechtel 1.30
30 Bulwer 9
140 Bodie 11¼
1070 Belle Isle 3.70@3.65
300 Belmont 90c
1550 Champion 50c
170 C Pacific 7@6½
230 Caledonia (B H) 3½
345 Dudley 1
245 Eureka Con 15½@15¼
25 Giant & O A 5½
120 Goodshaw 45c
10 Golden Terra 13⅞
550 Grand Prize 3@2.90
1020 Gila 1.30@1¼
850 Hillside 1.40
360 Independence 2¼@2.10
640 Jupiter 2½@2¼
260 Jackson 4⅞@5
1700 Leopard 55@65c
100 Leeds 70c
200 Martin White 3½@3.70
70 Mammoth 8@7⅞
510 Mono 9⅞@9½
50 McClinton 75c
100 Modoc 1.15
100 Mt Diablo 4.90@4.95
135 Manhattan 2⅞@2.65
210 Northern Belle 4@4¼
200 Noonday 3⅞
4700 N Belle Is 40@45c
20 N Noonday 3
550 Oriental 40@35c
500 Orient 25@20c
900 Paradise 2¼@2.30
50 Queen Bee 55c
200 Richer 15c
1870 Raymond & E 95c@1
450 S Bodie 35c
200 S Bulwer 80c
250 Syndicate 5½@6.
300 Silver Prize 20c
100 Star 40c
225 Tuscarora 5@10c
500 Tioga Con 3⅞@3.55
100 University 30c
150 Vortex 60c
35 Wales 6@6½

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Con M Co	Nevada	10	1 00	Aug 7	Sept 11	Oct 11	Wm Willis	309 Montgomery st
Argonaut M & M Co	California	1	05	Aug 11	Sept 16	Oct 6	J L Fields	240 Montgomery st
Amazon Con M Co	Nevada	6	10	Mar 24	June 11	Aug 29	Jno Crockett	12 Cosmopolitan Hotel
Belcher S M Co	Nevada	19	1 00	July 21	Aug 26	Sept 16	Jno Crockett	203 Bush st
Belmont M Co	Nevada	21	30	July 1	Aug 7	Sept 2	J W Pew	310 Pine st
Belvidere M Co	California	4	25	July 9	Aug 11	Sept 6	C V Hubbard	203 Bush st
Booker Con G M Co	California	3	50	June 30	Aug 4	Aug 25	W H Lent	309 Montgomery st
Brilliant M Co	Nevada	4	10	July 18	Aug 18	Sept 3	H S Stone	419 California st
Bullion M Co	Nevada	10	1 50	July 9	Aug 13	Sept 3	J Gruss	418 California st
Champion M Co	Nevada		25	July 26	Aug 31	Sep 30	G C Hurlbut	525 Commercial st
Commonwealth Con M Co	Nevada	1	25	June 27	July 11	Aug 30	C A Morse	217 Sansome st
Eagle S M Co	Nevada	14	10	Aug 4	Sept 10	Sept 30	J E Byrne	533 Kearney st
Exchequer M Co	Nevada	14	1 50	July 9	Aug 15	Sept 5	J Gruss	418 California st
Flowery M Co	Nevada	2	25	Aug 6	Sept 10	Sept 30	W W Stetson	309 Montgomery st
Gold Deposit G & S M Co	California	1	25	July 25	Aug 28	Sept 16	J M Buffington	209 California st
Goodshaw M Co	California	4	25	July 9	Aug 23	Sept 30	V Fernbach	327 Pine st
Gould & Curry S M Co	Nevada	36	1 00	July 10	Aug 14	Sept 3	Alfred K Durbrow	309 Montg'y st
Julia Con M Co	Nevada	9	1 25	July 8	Aug 13	Sept 4	H A Charles	419 California st
Justice M Co	Nevada	—	1 00	———	Sept 11	Sept 30	R E Kelley	419 California st
Jupiter M Co	California	4	25	July 5	Aug 11	Sept 4	E C Masten	22 Nevada Block
K K Con M Co	Nevada	—	1 00	Aug 1	Sept 3	Oct 1	B B Minor	309 Montgomery st
Leviathan M Co	Nevada	9	25	Aug 6	Sept 9	Sept 30	F E Luty	330 Pine st
Manhattan S M Co	Nevada	13	1 00	July 16	Aug 21	Sept 12	Jno Crockett	203 Bush st
McCrackin Con M Co	Arizona	3	25	July 29	Aug 29	Sept 17	H Aug Whiting	211 Sansome st
Mexican G & S M Co	Nevada	7	2 00	July 11	Aug 14	Sept 4	C L McCoy	203 Bush st
North Bonanza M Co	Nevada	3	25	Aug 13	Sept 17	Oct 7	W W Stetson	309 Montgomery st
New York M Co	Nevada	19	40	July 8	Aug 9	Aug 29	D L Thomas	203 Bush st
Original Keystone S M Co	Nevada	2	25	July 28	Sept 1	Sept 28	F E Luty	330 Pine st
Real Del Monte M Co	Nevada	7	1 00	June 10	July 19	Aug 23	C V D Hubbard	203 Bush st
Savage M Co	Nevada	36	1 00	July 8	Aug 11	Aug 30	E B Holmes	309 Montgomery st
Silver Hill M Co	Nevada	7	50	July 10	Aug 14	Sept 4	W E Dean	203 Bush st
South Bodie G M Co	California	1	25	July 18	Aug 25	Sept 17	H Dess	309 Montgomery st
South Bulwer	California	4	15	July 16	Aug 20	Sept 12	Wm Stuart	320 Sansome st
Tellurium G & S M Co	California	19	10	Aug 1	Sept 1	Sept 24	J M Litchfield	415 Montgomery st
Trojan M Co	Nevada	11	25	July 14	Aug 18	Sept 8	David Wilder	328 Montgomery st
Tuscarora M & M Co	Nevada	4	10	Aug 2	Sept 6	Sept 30	M E Sperling	309 California st
Union Con S M Co	Nevada	14	2 00	July 31	Sept 4	Sept 23	J M Buffington	309 California st
Ward G & S M Co	Nevada	4	50	July 2	Aug 7	Aug 27	J Stadtfeldt, Jr	26 Haywards Build
William Penn	Nevada	5	05	July 12	Aug 30	Sept 15	O J Humphrey	328 Montgomery st
Yellow Jacket S M Co	Nevada	33	1 00	Aug 4	Sept 8	Oct 8	Mercer Otey	Gold Hill, Nevada

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Addenda G & S M Co	California	1	20	July 2	Aug 7	Aug 28	T H Dixon	238 Montgomery st
Armand G & S M Co	California	1	10	June 9	July 28	Aug 25	J L Fields	240 Montgomery st
Black Hawk G M Co	California	6	50	July 1	Aug 4	Aug 25	H A Charles	21 Haywards Build
Curtis Con M Co	Nevada	1	10	July 11	Aug 11	Aug 30	H S Stone	419 California st
Dudley M Co	California	5	50	Aug 14	Sept 17	Oct 13	E. C. Masten	309 Montgomery st
Hartford S M Co	California	1	50	June 18	July 21	Sept 13	S Heringhi	422 Montgomery st
Harrington M Co	California	1	20	Aug 11	Sept 18	Oct 8	W W Bausman	426 California st
Mayflower Grav M Co	California	5	10	June 17	July 22	Aug 23	J Morizio	328 Montgomery st
North Scorpion M Co	Nevada	1	10	Aug 11	Sept 20	Oct 10	T B Ludlum	318 Pine st
Original Keystone S M Co	Nevada	2	25	July 28	Sept 1	Sept 28	F E Luty	330 Pine
Occidental M Co	Nevada	5	50	Aug 11	Sept 15	Oct 6	A K Purhrow	309 Montgomery st
Oro M Co	California	2	05	———	Aug 4	Aug 23	Wm Stuart	320 Sansome st
Queen Bee M Co	California	4	10	July 10	Aug 30	Sept 2	T A White	113 Leidesdorff st
Rustler G M Co	California	1	10	June 30	Aug 4	Aug 18	A F Main	309 California st
San Pedro G & S M Co	California	2	05	July 29	Aug 29	Sept 15	T A White	113 Leidesdorff st
South Comstock M Co	Nevada	5	25	Jan 13	———	Aug 26	J M Buffington	311 California st
Sherwood Con M Co	Nevada	1	25	July 12	Aug 12	Aug 30	H S Stone	419 California st
Swansea M Co	California	1	10	June 14	Aug 4	Aug 25	F N Delaney	315 California st
Richer M Co	California	3	25	July 30	Sept 3	Sept 28	W H Lent	309 Montgomery st
Wide Awake M & P Co	Arizona	7	02	June 23	Aug 1	Sept 1	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Addenda G & S M Co	California	T H Dixon	238 Montgomery st	Annual	Sept 4
Bodie H M & W Co	California	E C Masten	309 Montgomery st	Annual	Sept 9
Crown Point Rav'e G & S M Co	Nevada	J M Buffington	309 California st	Annual	Sept 1
Dudley M Co	California	E C Masten	309 Montgomery st	Annual	Sept 8
Headlight M Co	California	A W Rose	302 Montgomery st	Annual	Sept 3
Jupiter M Co	California	E O Masten	309 Montgomery st	Annual	Sept 15
Lucky Rock G M Co	———	Chas Healy	Merchants Exchange	Annual	Aug 26
Meadow Valley M Co	Nevada	T W Colburn	414 California st	Annual	Aug 28
Mono G M Co	California	Wm H Lent	309 Montgomery st	Annual	Sept 4
Queen Bee M Co	California	Thos A White	113 Leidesdorff st	Annual	Sept 1
Star M Co	Nevada	Wm Stuart	302 Sansome st	Annual	Aug 25

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Argenta M Co	Nevada	J E Dixon	Stock Exchange	20	July 25
Belle Isle M Co	Nevada	John E Dixon	Stock Exchange	50	Aug 5
Bodie Con M Co	California	W H Lent	Nevada Block	1 00	Aug 1
California M Co	Nevada	C P Gordon	'23 Nevada Block	50	Aug 17
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	50	Aug 16
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	1 00	July 21
Independence M Co	Nevada	John E Dixon	Stock Exchange	25	Aug 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	July 26
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	30	July 28
Montezuma M & M Co	———	J T McGeoghegan	318 Pine st	25	Aug 12
Standard Con M Co	California	Wm Willis	309 Montgomery st	50	Aug 12

SALES OF LAST WEEK AND THIS COMPARED

Thursd'y A. M., Aug. 14.
25 Alpha 23
215 Alta 6⅝@6½
50 Andes 1.10
20 Belcher 4
140 B & Belcher 18¼@18½
425 Bullion 6½@6
900 Benton 4@4.05
155 Crown Point 4½@4.60
315 Chollar 6½
300 Con Imperial 1.45
50 Confidence 11½
995 California 5¼@5
160 Con Virginia 5½
40 Challenge 2.40
275 Caledonia 2.05@2.10
360 Con Washoe 50c
500 C P Ravine 30c
550 Con Dorado 1½@1.40
345 Exchequer 6½@6½
480 Flowery 60@55c
130 Gould & Curry 11⅝@11.05
325 Hale & Nor 14@13⅞
255 Justice 3½@3.40
225 Julia 4.35@4.40
70 Kentuck 4.45
140 Kossuth 25c
100 Lady Bryan 1.05
260 Mexican 32⅞@32¼
180 Mackey 1.30
110 North Con Vir 9
450 New York 75@80c
300 N Bonanza 1.40@1½
200 Ophir 36¼
265 Overman 9½@9⅞
595 Occidental 1.40@1.30
115 Potosi 4⅞@4.80
330 Sierra Nevada 43@42½
680 Savage 12⅞@13
5 Seg Belcher 25
465 Silver Hill 1.70@1⅞
160 Scorpion 2.40@2.35
500 S Utah 5c
50 Trojan 30c
120 Utah 19½@19⅞
500 Union 50@51¼
100 Ward 1.80@1.85
100 Wells-Fargo 10c

Thursday A.M., Aug. 21.
240 Alta 6⅝@6½
50 Alpha 23¼@23½
320 Andes 1
210 Best & Belcher 18½
400 Belcher 4⅞
280 Bullion 6¼@6½
330 Benton 3.70@4
240 Con Virginia 4.60
260 Chollar 6½
325 California 4.60
135 Crown Point 4¼@4.30
80 Confidence 11
650 Con Imperial 1.40
130 Caledonia 2@2.05
80 Challenge 2.40@2¼
150 C P Ravine 75c
300 Con Washoe 70c
350 C Dorado 1½@1.40
290 Exchequer 6½@6⅝
995 Flowery 50@55c
415 Gould & Curry 11¼@11⅝
100 Geo Douglas 40c
295 Hale & Nor 13¼@13½
330 Justice 3¼@3.10
425 Julia 4.10@4.30
1000 L Bryan 55@65c
275 Lady Wash 1.15@1.10
355 Leviathan 25c
1075 Mexican 32½@32
580 Mackey 1.30@1.20
50 Morning Star 3
550 New York 75@70c
115 N Con Vir 9
165 Ophir 35½@35
90 Overman 9½@9
240 Occidental 1.35@1.40
200 Potosi 4⅞@4.70
210 Savage 12⅞@12⅝
345 Sierra Nevada 39½@39¼
120 Silver Hill 1.70@1.65
570 Scorpion 2.40
1450 S Utah 5c
130 Utah 18¼@18⅞
535 Union Con 48@47¼
210 Ward 1⅞
550 Woodville 50c
400 Wells-Fargo 10c

160 Woodville 50@40c
100 Yellow Jacket 17@17⅛

AFTERNOON SESSION.
910 Argenta 1
400 Addenda 50@45c
250 Albion 25@20c
970 Booker 1½@1.10
400 Boston 1½@1.30
700 B Chief 50@55c
100 Belmont 1
1880 Belle Isle 3⅞@3.65
320 Bulwer 9
170 Bodie 11⅝@11⅞
100 Belvidere 1.10
220 Black Hawk 1.30
95 Bechtel 1½
700 Champion 45@40c
90 Con Pacific 6⅞@6⅞
100 Caledonia (B H) 2½
300 Day 25c
265 Dudley 1½@1.40
100 D Standard 75c
105 Eureka Con 16@15½
50 Gila 1.30
220 Grand Prize 4
525 Goodshaw 40c
500 Golden Terra 13½@13
100 Giant & O A 5½
20 Hillside 1
830 Independence 2.60@2½
475 Jupiter 2.10@2
500 Leopard 1.05
50 Leeds 70c
15 Manhattan 1⅞
400 Modoc 1.10
230 McClinton 1
350 Mono 9⅝@9½
505 Mammoth 7½@7
170 M White 3
50 Northern Belle 4
1450 N Belle Is 45c
100 Noonday 3½
250 N Noonday 2⅞
3025 Oriental 75@65c
100 Orient 30c
350 Paradise 1.85@1.80
550 Queen Bee 65c
145 Raymond & E 3⅞@4
550 Richer 30@25c
150 Rough & Ready 50c
325 Silver Prize 20⅞
130 Syndicate 6c
75 Summit 1.80@1c
950 S Bodie 15c
100 Star 454
325 Tuscarora 5@101
610 Tioga Con c
120 Tiptop 1
250 Vortex 65c
60 Wales 6½

200 Yellow Jacket 16½@16⅝

AFTERNOON SESSION.
450 Addenda 40@50c
150 Albion 5c
650 Argenta 80@90c
650 Boston 1¼
40 Belvidere 1
475 Black Hawk 1¼
165 Booker 1.15@1.10
600 B Chief 60c
10 Bulwer 8½
40 Bodie 10⅞
770 Belle Isle 3.70
200 Bechtel 1.30@1¼
300 Belmont 70@85c
250 C Pacific 7@5
800 Champion 50@45c
100 Day 30c
255 Dudley 1
100 Endowment 40c
60 Eureka Con 16⅞@16
50 Golden Terra 13
100 Goodshaw 40c
550 Grand Prize 2.90@2⅞
510 Gila 1.20@1.15
450 Hillside 1¼
14·0 Independence 2
75 Jackson 5½
160 Jupiter 2¼
3160 Leopard 55@60c
50 McClinton 75c
660 Martin White 3½@3¼
80 Mammoth 7⅞
750 Mono 8½@8
220 Manhattan 1⅞@1.65
20 Mt Diablo 5
55 Noonday 3⅞
1000 N Belle Is 45c
170 N Noonday 2.80@2⅞
300 Orient 20c
1800 Oriental 25@35c
500 Paradise 2.45
250 Queen Bee 50@55c
300 Richer 20c
960 Raymond & Ely 95@90c
200 S Bulwer 75c
350 Syndicate 5⅞
200 Silver Prize 20c
50 Star 40c
200 S Bodie 35c
150 Summit 1.70@1⅞
445 Tioga Con 3.60@3½
50 University 30c

Pacific Board—Latest Sales.

Wed'sday A.M., Aug. 20.
60 Alpha 23⅞
10 Benton 4.20
20 Best & Belcher 19@19½
100 Bullion 6⅝
110 Belcher 3.90@3⅞
120 California 4.65@4.60
55 Con Virginia 4.65@4⅞
200 Con Imperial 1.45@1.40
50 Chollar 6⅝
150 Crown Point 4⅝@4.35
10 Exchequer 6⅝
130 Gould & Curry 11⅞
110 Hale & Nor 13⅝@13⅞
70 Julia 4.35@4¼
20 Kentuck 4¼
80 Lady Wash 1.30
200 Leopard 55@60c
160 Mexican 35@34⅞
160 Ophir 35⅞@37
20 Overman 9
100 Potosi 4¼

100 S Nevada	.41@42	50 Grand Prize	2.70
100 Savage	.13	100 Gould & Curry	.11
30 Silver Hill	1.65	20 Hale & Nor	.13
20 Union	.56	50 Justice	3.35
60 Yellow Jacket	.16@16	100 Leopard	.70c
AFTERNOON SESSION.		110 Mexican	.33@34
20 Andes	1.05	20 Mono	.9@.9
70 Bullion	.6@6.40	200 N Standard	2.40
75 Best & Belcher	.18@.18	10 Ophir	.36
20 Belcher	3.85	10 Savage	.13
80 California	4.65	10 Silver Hill	1.65
20 Con Virginia	4.60	150 Uncle Sam	.3@3.05
10 Confidence	.11	40 Yellow Jacket	.16

California Board—Latest Sales.

Wed'sday A. M., Aug. 20.		100 Andes	.1
		700 Atlantic	.40@.3c
20 Alpha	.23@.23	1300 Atlas	.2c
200 Atlantic	.40c	1000 Almaden Q	.2@.2
40 Belcher	3.85@3.80	60 Belcher	.3@3.85
60 Best & Belcher	.19	50 Best & Belcher	.18@.18
40 Bullion	.6	20 Bullion	.6
50 California	4.65	100 California	.4.60@4.65
50 Con Virginia	4.60	35 Con Virginia	4.65
300 Con Imperial	.1.40@1.45	200 Con Imperial	1.45
50 Crown Point	.4@4.30	70 Crown Point	.4.45@4.30
140 Challenge	.2@2.55	30 Chollar	.6@.6
40 Caledonia	.2 10	25 Challenge	.2
80 Exchequer	.6@.6	100 Caledonia	.2
40 Gould & Curry	.11	100 Con Washoe	.35c
30 Hale & Nor	.14@.14	500 Coso Con	.5c
110 Julia	.4.20@4.35	100 Central	.6c
60 Justice	.3@3.45	45 Exchequer	.6@.6
50 Kossuth	.20c	1000 Enterprise	.1
100 Leviathan	.40c	20 Gould & Curry	.11
200 Lady Wash	.1	40 Hale & Nor	.14
30 Mexican	.35	40 Julia	.4.35@4.40
200 Mint	.8c	70 Justice	.3.40@3.45
100 Newark	.12c	90 Mexican	.33@.34
600 N Union	.40c	100 Mint	.9c
30 Ophir	.36@.36	200 N Sierra Nevada	.6c
40 Potosi	.4.85@4.80	200 Newark	.12c
20 Savage	.13@.13	40 Potosi	.4.85
30 Sierra Nevada	.41@.41	30 Savage	.13@.13
150 Senator	.25c	10 Sierra Nevada	.41
200 Silver Prize	.20c	300 Succor	.10c
20 Union Con	.55@.57	200 Silver Prize	.20c
200 Wm Penn	.10c	120 S Bodie	.30c
20 Yellow Jacket	.16@.16	10 Union Con	.54
AFTERNOON SESSION.		100 Ward	1.85
30 Alpha	.23	200 Woodville	.50c
50 Alta	.7@.71	30 Yellow Jacket	.16

The Mining Share Market.

"Slack and sluggish" are the stock words which have characterized the market for the past week. Beginning at a slight rise, the market lost its grip and fell again, remaining at the same level up to the present time of writing. There have not been any great "opportunities" for speculation. Comstock seems to be flat on its back, although there are considerable expectations. Too much deferred hope sickens the public. After all, our mining stocks may now be considered as approaching their normal condition, and to rise to any great degree will involve exciting news which buyers and sellers do not expect. The condition of things on the Comstock, viz.: water, is a striking illustration of the quality of some of the stock, and, as the public have been often flooded with watered stock, so now the favorite element of the manipulators has taken possession of their mines—a just retribution. In our opinion the time has gone by for sudden and great fluctuations in stocks, and reasonable profits obtained by ordinary fluctuations must alone be expected. We would rejoice if the evils of stock speculation had effected their own cure.

Bodie might stand a rise. The out-put of the mine and the prospects would justify it. But the stock has not yet gone a-begging, and cannot be had at ruling prices on every street corner. All the stocks seem to feel the depression of the times, and, like sugar and other things, come down to bedrock prices. Although we might be correct in saying that the caution exercised in purchasing has forced holders into the condition of temporary bears against their will.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Hillside, August 15th, $4,600; Alexander, August 15th, $7,205.83; Bodie Con., August 18th, $12,500; Leopard, August 19th, $4,000; Hillside, August 18th, $4,400; Belle Isle, August 18th, $21,000; Independence, August 18th, $4,300; Northern Belle, August 16th, $4,242.07.

CENTRAL STEAM SUPPLY.—The system of supplying steam for all economical and household purposes, as gas is, from a central manufactory, seems to be gaining headway in the Eastern States. The system has been introduced in Detroit, Michigan, where 10 miles of pipes are already laid, and 800 horse-power furnished. Other cities are introducing it. The loss by condensation is averted by junction boxes placed at every 200 feet of pipe. The pipe has an external non-conducting covering of hair felt, and is enclosed in a wooden box. At Springfield, Massachusetts, the system is said to be paying 17% on its cost in the first six months of its use. The practical working of this new feature of domestic and industrial economy seems to be well demonstrated. It has been tried in a small way in nearly every large city. The only new feature about it is its wholesale character. While much doubt has been expressed as to the impossibility of preventing the condensation of steam through such a long system of pipes, the theory is that it cannot be done, while practically it is done every day.

IN San Francisco half dollars are quoted at 99½ buying, 99¾ selling; trade dollars, 97 buying, 98 selling; Mexican dollars, 98 buying, 98½ selling.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

ITEMS.—*Dispatch*, Aug 16: A very flattering prospect has been struck in the north drift of the Moore mine, at the depth of 180 ft. Instead of a six or eight-inch vein, they now have a well-defined ledge four ft wide, the rock of which looks very rich. Rock enough is being taken from the mine to keep the mill in constant operation. The large square timbers and other necessary lumber for the Coney hoisting works are now being hauled to the mine from Brandon's mill, and the grading for the structure is under full headway. Mining operations at Butte basin are progressing favorably. The shaft is down over 80 ft with no gravel in sight. The flow of water is considerable, and powerful pumping machinery is required to keep it down. It is hardly expected to strike pay dirt before a depth of 150 ft is attained.

FRESNO.

ITEM.—*Expositor*, Aug. 20: The new mining district recently organized by Tadlock, Collins and others, and named Fresno mining district, is in the slate range, and contains a number of well-defined ledges, the value of which are yet to be determined by prospecting. Mr. Collins informs us that the principal ledges are found near the western base of Mount Goddard. The three principal ledges run parallel with each other, and are traceable for several miles. The ore carries gold and silver. Below where the ledges cross a ravine, one of the parties scraped together some earth and gravel, and on panning it out numerous particles of gold were found.

SPANGLED GULD MINE.—This mine is situated high up on the western side of Spangled Gold gulch, two miles from where the stream which flows at the foot of the ridge empties into the Fresno river. The tunnel and cut follow the vein 250 ft into the mountain—the cut being 70 ft and the tunnel 180 ft long. At the breast of the tunnel the ledge shows plainly, cutting across the tunnel at a depth of about 125 ft from the surface. It is here four ft wide. The general dip of the vein is about 55°. Some very rich rock is being taken out of the shaft. The vein has been traced one and one-half miles. The rock yields about $50 per ton.

INYO.

MODOCK.—*Independent*, Aug. 16: At south drift, 300-ft point, run seven ft; drift from winze, 300-ft point, 14 ft; drift from 300 ft point, 18 ft; crosscut from drift, 1000-ft point, 22 ft; upraise at 1100-ft drift raised one ft; drift from upraise, 1100-ft point, 17 ft. Total length of south drift at 300-ft point, 137 ft; drift from winze, 68 ft; 800-ft drift, 112 ft; crosscut at 1000-ft point, 97 ft; upraise at 1100-ft point, 30 ft; drift from raise 17 ft; drift from winze, 300-ft point, is still in ore, as it has been for the past 50 ft, and looking as well as at any time heretofore. The 800-ft drift and crosscut from 1000-ft point are looking remarkably well.

WACO STAR.—This ledge is located about four miles northerly from the Brown Monster mill, on the western face of the Inyo range. It shows an ore body of full seven ft in width, assaying from $22.50 to $340 per ton, gold and silver combined. The ledge is traceable for over a mile in length.

MONO.

STANDARD.—*News*, Aug. 17: The north drift, 385 level, is in 325 ft, and the ledge in the drift is three ft wide, of good ore. In the stopes the ledge is from 10 to 20 ft wide, of very fine ore. The winze in the west crosscut, 550 level, is now down 35 ft. The ledge is now five ft wide, and is looking very well. They have upraised on this ledge 80 ft. There is about six ft of good ore in this upraise at present writing. The west crosscut, 300 level, is now in a distance of 40 ft, in good blasting rock. The West Standard ledge in the stopes is looking about the same as last report; the ore is 10 ft wide and is as rich as usual. In the south drift, 550 level, the stopes are looking particularly well; the ledge is 12 ft wide, of very good ore. The ledge in the Gildea stopes is three and one-half ft wide, of good milling ore.

BOOKER.—Shaft sunk and timbered to a depth of 400 ft. Engaged cutting out a station, preparatory to drifting, which will be commenced this week.

SOUTH STANDARD.—During the past week the drift from the east crosscut, 400 level, has been advanced 10 ft, without any change in the character of the vein. In the drift north from the shaft 11 ft has been made. Work has been commenced at the 200 level, cutting out and enlarging the station to receive a tank of 10,000 gallons capacity.

UNIVERSITY.—Three-compartment new shaft now down 73 ft, and still sinking. In the east side of the shaft at the bottom the ledge makes its appearance and shows a fine character of quartz. The whole width of the shaft is in ledge matter of fair quality, all of which prospects in gold.

MARYLAND CON.—New double-compartment shaft now down 70 ft, showing many stringers of quartz coming in from the west.

VORTEX.—Sinking the winze on the 200 level is still making favorable progress. The ledge in the bottom is two and one-half ft wide, of good ore, formation favorable and looking well. The winze has now attained a depth of 40 ft. It is the intention to continue sinking until connection is made with the west crosscut, now in progress from the Osceola tunnel, owned by the Syndicate company. Connection will be made at a depth of 70 ft. When connection is made, drifts north and south will be started on the ledge, and stoping the ore for milling purposes commenced.

ORO.—The bottom of the shaft shows well in mineral, and gold has been found in the rock.

GOODSHAW.—The winze from No. 2 vein is down 50 ft. The formation looks remarkably favorable in the bottom. The south drift on vein No. 2 has been advanced 30 ft.

SOUTH BULWER.—Still continuing work on the 350 level, sinking and drifting on the ledge. Ledge in face of drift looking well, three ft wide, all good ore. Winze No. 2 now down 50 ft; ledge in the bottom two and one-half ft wide, showing good ore. The west crosscut on the 420 level advanced 10 ft during the past week, making a total length of 33 ft; ground of a favorable character; have cut several stringers of good ore; indications favorable for cutting the ledge at any moment.

SUMMIT.—The north drift, 200 level, has been extended since last report nine ft; total length, 327 ft. The ledge is 18 inches wide. East crosscut from this drift is in 216 ft; progress since last report, 10 ft. The rock in the face is very hard. North drift, 300 level, has been advanced during the week 30 ft; total length, 352 ft. The ledge is three ft wide of fine-looking quartz. South drift, same level, is in 276 ft; progress since last report, 29 ft. The ledge is two and one-half ft wide.

NOONDAY AND NORTH NOONDAY.—The combination shaft is now down 260 ft, and is passing through material of a most favorable character. The west crosscut is being extended through fine vein formation and well-defined bodies of quartz.

BODIE TUNNEL.—The tunnel is now in 1,120 ft, with favorable formation for striking another ledge. The rock is blue porphyry stained with iron, which is a favorable indication of the near presence of ore. The south drift is 75 ft from the main tunnel, following the vein encountered at 900 ft the entire distance, and has about 18 inches of fine quartz between the walls. Air continues good, and men can now work with comfort anywhere in the tunnel.

BULWER.—The south drift, 380 level, has been extended since last report 12 ft; total length, 157 ft. The ledge is two and one-half ft wide of good ore. The west crosscut from this drift is in 30 ft in fair blasting ground. The winze on the Ralston ledge has reached a depth of 27 ft, the ledge two and one-third ft wide of fine ore.

SOUTH BELVIDERE.—Shaft has attained a depth of 150 ft, and are now engaged cutting out station at the bottom of shaft.

SOUTH NOONDAY.—Shaft down 65 ft, and drifting north and south on the ledge. The prospects are flattering in the extreme for a pay vein of ore similar to that found in the Noonday further north.

NEVADA.

ORIENTAL.—*Transcript*, Aug. 16: The Oriental gold mining company expect to have their new mill in operation by the 20th of this month. Over 800 tons of rich ore is now in the ore house ready for crushing.

DERBEC.—The channel in this mine has been opened up for over 100 ft across, and the west rimrock is yet to be developed. The average depth of the pay gravel is eight ft. Eighty men are now at work, and on the 1st of September 40 or 50 additional will be employed and 500 tons of gravel per day will then be raised. The gravel-washing machine to be put on trial will be ready to start up in about two weeks. It has a capacity of 150 tons per day.

ITEMS.—For 10 days past a force of men have been employed in cleaning out the tunnel of the Alice Bell and Lone Star ledges on the Murchie mining company's property. Those leads are to be thoroughly prospected this fall, and the chances are good that hoisting works will be erected on them before many months elapse. When the Murchie brothers were mining on the Alice Bell and Lone Star they took out considerable rich ore, and it is the belief of many acquainted with the claim that they are better ledges than the Big Blue, which is now being so extensively developed.

ITEMS.—*Herald*, Aug. 16: Day before yesterday three-quarters of a ton of quartz from the neighborhood of Columbia Hill, was crushed at Keith's mill, and yielded at the rate of $10 per ton. The lead is over four ft thick and favorably situated. Lowell Hill appears to be in a more prosperous condition than for years past. About 75 men are employed drifting in the various claims, and about $5,000 paid for labor monthly.

PLUMAS.

BLUE GRAVEL.—Plumas *National*, Aug. 10: The owners of this mine have sunk a shaft to the depth of 00 ft, and drifted or tunneled from it about 400 ft, demonstrating that they were not low enough to tap the bottom of the channel. The hoisting and pumping is all done by water-power, and the loaded cars come from the drift and, raising on the cage to the surface, are dumped within a few feet of the mouth of the shaft. The gravel on the rim or pitch where they "lost bottom" was very rich, paying from $2 to $3 to the carload. The work has to be done again, however, as it will be necessary to sink the shaft 50 or 60 ft deeper and then run a new tunnel, which will tap the channel low enough to bottom it. Arrangements are now being perfected for this, and we think it safe to say that work on the new tunnel will soon be started. The mine is situated almost on the bank of the Middle Fork in the Willow Creek and Nelson Point country. The hydraulic claim near the same place shows a splendid channel of pay dirt. The bank grows deeper as the work progresses, and at present is probably 00 ft, clear gravel; not a particle of pipe clay, and we are told that it prospects "from the bedrock to the grass-roots."

SACRAMENTO.

FOLSOM.—*Telegraph*, Aug. 10: A number of Portuguese are mining on the opposite side of the American river, and for a few days past have been making sluice boxes for the purpose of carrying the tailings from their claims to the river.

SIERRA.

ITEMS.—The tunnel of the Planet gravel mining company is now in a distance of over 1,900 ft, and the drift is entirely in gravel, which improves in its prospects as distance is made. Last week the drift was extended 20 ft. The gravel prospects very favorably, but it is not considered that the center of the channel has been reached, as the big boulders which are found in it in adjoining claims are not yet encountered. The Boston Ravine quartz claim is one of the old locations on Massachusetts hill, located on the dips and angles, and in length about 1,500 ft, running southerly from near the dump-pile on the Stockbridge ground to Mary's ravine, emptying into Wolf creek. Work has been resumed upon it. Machinery for a mill has been ordered for the Santa Anitia mine. This mine is situated on the northwest side of Poorman's creek, about two miles from the town of Washington. Since January 1st, 1879, to date, 335 mining claims have been located and duly recorded. William Talbert's strike on Gold flat is likely to prove a valuable one. He has sunk down on it about 40 ft, and the lead has gradually enlarged, until now at the bottom of the shaft it is two ft thick. The tunnel in the Bessie Miller mine, near Washington, has cut the ledge or a part of it, about six ft thick. It is understood that machinery has been ordered and a mill will be erected soon. At the bottom of the incline in the Scadden Flat mine very rich free gold-bearing rock has been struck. The specimens shown are, besides being well specked over with free gold, heavily charged with sulphurets.

NEVADA.

WASHOE DISTRICT.

UNION CON.—Gold Hill *News*, Aug. 20: The drift east on this level toward the Union shaft is in vein porphyry requiring to be blasted, and has its face 190 ft from the main north drift. There has been of late a slight increase of water in this drift. The joint Mexican crosscut west on the 2000 level is passing through a soft vein formation carrying streaks of quartz and clay; total length, 30 ft. Of late the joint Mexican winze from this level has encountered an increased flow of water, and a donkey pump has been put in to handle it. The intense heat has interfered with work in the raise from the 2300 level (Sierra Nevada 2200 level) during the week, and also with sinking the winze from this level; and nothing has been done in either place since last report. On the 2400 level (Sierra Nevada 2300 level) the diamond drill running 2½° west of south from the Sierra Nevada incline, and on a depression of one foot in ten, has developed a continuation of fair-grade ore, which extends as far as the drill has penetrated. This, together with the developments made by the drill when run at an angle of 45° further west, shows a good body of ore in the mine on this level.

OPHIR.—The 2400 level has been reached on the incline and the station set put in. The material at this point is most promising. On the 2300 level the north drift is making five ft per day, its face in a fine vein formation, showing streaks of clay and quartz, and 100 ft north of the main east drift. The west crosscut, 2100 level, from the end of the drift north from No. 1 winze is in porphyry showing streaks of rich quartz; total length, 50 ft. The joint Mexican winze from the 2100 level is in hard porphyry, carrying an increased flow of water; total depth, 50 ft. The joint Mexican crosscut west, 2000 level, is in 45 ft, and in softer ground. The stopes continue their yield of 80 tons of rich ore per day.

CON. VIRGINIA.—The joint crosscut, 850 level continues to cut a formation of hard porphyry, carrying some water; total length, 580 ft. No. 2 winze has been reached by the drift on the 1050 level, which is now being enlarged to full size for better ventilation, preparatory to exploring through it the ground to the south and east of the old stopes on this level and the level below. Crosscut No. 1, 1750 level, continues to penetrate a favorable vein formation showing some ore; total length, 90 ft. On the 2150 level the east crosscut is in 135 ft, the face in favorable rock containing low-grade quartz.

UNION SHAFT.—The raise from the Sierra Nevada east drift, 2000 level, has been enlarged to that level, affording increased ventilation to that mine and to the Union. Sinking for the Sierra Nevada 2200 level is being continued. The west drift on the 1000 level to connect with that east in Union ground is in 50 ft and penetrating blasting porphyry.

GOULD & CURRY.—The joint east crosscut on the 1700 level is being driven at the rate of five ft per day, through blasting porphyry. At the new joint shaft sinking is going on, the 700 level being at hand. The water continues to flow copiously, but has of late manifested signs of weakening.

CALIFORNIA.—The drift south from the bottom of the winze, 1950 level, continues in vein matter, showing streaks of ore. The joint west crosscut, 850 level, has its face 580 ft west of the shaft, in hard porphyry, carrying some water.

ALTA.—There is some water at the bottom of the Incline below the 1750 level, but a donkey pump was put in place Monday evening, which handles it easily. The south drift, 1750 level, and the north drift on the 1550 level, in Lady Washington ground, are progressing well. Raises are being made in the ore body from the 1550 to the 1450, and from the 1450 to the 1350. The mill is turning out bullion, but the amount yielded has not yet been determined.

MEXICAN.—The bottom is in hard porphyry, 50 ft down. The joint Ophir crosscut on the 2000 level is in 45 ft and passing through a softer formation than at last report. The joint Union crosscut is also in a soft formation carrying quartz and clay; total length, 50 ft. An increased flow of water has rendered it necessary to put a donkey pump in the joint Union winze from this level, sinking now is making good progress

LEVIATHAN.—A heavy stringer of quartz, being an offshoot from the main ore vein, some two ft in thickness, was cut through yesterday by the north lateral drift on the 750 level. It gave assays up to $12 to the ton. The face of the drift is now in hard vein porphyry again, with small streaks of quartz.

WARD.—The shaft has attained a depth of 1,018 ft. The inflow of water is strong. The shaft has of late penetrated some very fine-looking vein matter containing low-grade quartz of a promising nature.

BEST & BELCHER.—The joint east crosscut, 1700 level, is now in 1,135 ft, the face in hard porphyry which blasts well. The flow of water at the new joint shaft is strong, but manifests signs of weakening.

JUSTICE.—Crosscuts Nos. 1 and 3 east, 1350 level, are passing through nice quartz from which small assays are obtained. The lateral drifts north and south along the west ore chamber and crosscut No. 2 west, are showing spots of nice ore. Sunday the work of opening the 1650 level from the 1550 level of the Alta was commenced.

TROJAN.—The west crosscut from the northeast drift, third level, is now 00 ft in porphyry and quartz. The raise from the second level is passing through porphyry containing streaks of fair ore. It is now up 50 ft.

NIAGARA.—The south lateral drift on the 500 level shows an increase of quartz, giving better assays. The north lateral drift, same level, continues in vein porphyry and quartz.

OCCIDENTAL.—The drift north from the bottom of this winze below the lower tunnel is being pushed ahead and is encountering favorable vein matter.

CALEDONIA.—Sinking the winze from the 1000 to the 1000 level and making good progress Last evening the depth attained was 277 ft.

BROTHY.—The tunnel is giving increased indications of nearing the ledge, the face being a mixture of clay, quartz and porphyry.

LADY BRYAN.—The drifts north and south on the 750 level continue in soft vein matter containing low-grade quartz. Work in the drift to get east of the shaft to raise the incline is making good progress. A promising body of quartz is being encountered in the drift west from the south drift 600 level. The north drift on this level continues in quartz and the crosscut east from this is also in quartz giving low assays.

NEW YORK.—The north lateral drift on the 1200 level continues to cut a promising vein of quartz yielding fair assays. The vein bears indications throughout the whole extent explored of making down, and when the 1400 crosscut reaches this portion of the ledge it is believed that important developments will be made.

BELMONT DISTRICT.

BELMONT MINE.—*Courier*, Aug. 16: The drift running from No. 3 raise north to connect with No. 2 has been extended 17 ft through a vein of quartz 3½ ft in thickness and 2 ft of same rich sulphuret ore which will mill fully $100 per ton. In No. 4 the ore body above 200 level south of shaft is looking fine and continues to get larger as opened up. Taking out about two tons daily of high grade chloride ore.

CORNUCOPIA DISTRICT.

ITEMS.—Gold Hill *News*, Aug. 10: From F. F. Collin, who came down from Cornucopia yesterday, we learn that last Saturday the west crosscut on the 800 level of the Leopard struck the main ore body or ledge 198 ft south of the shaft and 50 ft south of what is known as the north ore body. Where the crosscut first struck the vein it was only 4 inches in width, but in running 10 ft south it increased to fully 2 ft of solid ore. Assays from pulp samples from all of the rock taken out in running that distance average $102.09 in silver. It is expected that the main drift will reach the ledge to-day. The indications are regarded as most favorable for a development in the 300 of the finest and largest body of ore that has ever been discovered in the mine.

COMO DISTRICT.

ITEMS.—Virginia *Enterprise*, Aug. 15: The Eureka, formerly the Monte Christo, lies near the summit or divide, and is now only 00 ft deep. The ledge is 8 ft wide and nearly all pay ore. They have 70 tons of ore on their dump that will doubtless go $40 per ton. The old Rappahanock, now divided between the Rapidan and Peerless, is a large, well-defined ledge, and crops out for nearly half a mile. The Crœsus is a promising mine, and is now being worked.

PARADISE DISTRICT.

ITEMS.—*Silver State*, Aug. 14: Capt. Wright, who has been looking up stock on the Owyhee, near Three Forks, says he discovered several rich and well-defined ledges in that country.

REVEILLE DISTRICT.

GILA MINE.—Eureka *Sentinel*, Aug. 14: The vein in this mine will average about two ft in width, a part of which is very rich, some of it assaying as high as $1,000 per ton, and it will all probably average $150. Samples taken by three different parties, some time ago, gave an average of $160, $140 and $113. At or near the end of the south drift a winze has been sunk to the depth of 70 ft on the vein, which carries ore of about the same width and value as the drift above. In the bottom of this winze there is now about eight ft of good ore, with a perfect and regular wall. The ledge, which was badly broken near the surface, has now been recovered, and is found to go down strong and regular. Ore is being stoped and taken to the mill, the latter having been started up on the 8th instant.

REBEL CREEK DISTRICT.

OHIO LEDGE.—*Silver State*, Aug. 18: An assay of a car load of ore from this new ledge sampled at the Utah mill showed $964.61 in silver and $13.20 in gold.

ARIZONA.

ITEMS.—Prescott *Arizonian*, Aug. 14: Tiptop mill is running 12 out of every 24 hours. Very rich ores are being raised out of Black Warrior and Silver Prince shafts.

TOMBSTONE.—The Eagle mine shows rich ore in a shallow shaft on a vein of four ft, horn silver, lime and porphyritic walls—all the surroundings of highly metamorphosed lime. The "Amnesty," "Superior" and "McDuff" are clear chloride and carbonate locations, yielding by numerous assays from $150 to $250, with samples running to many thousands. The formation is a vast slope of quartzite, at the base of which, in a deep washed gulch, we find abrupt infringements of granitic trap; a little further, carboniferous limestone and shale, then trap dykes, limestone oozing from granitic beds. In the Donyhunt the ore seems a sort of cinder or ecoria, with crystals carbonate in character, while in spots both here and in the main shaft, which is now 192 ft deep, green, yellow and sky-blue streaks of chloride appear. In seven or eight large surface openings the ore is rich, and has actually produced at the mill as high as from $100 to $700

[CONTINUED ON PAGE 124.]

A Problem in Transmission of Power.

[Abstract from a thesis by CHARLES W. SLACK, College of Mechanics, University of California.]

Wire rops transmission becomes a valuable means of transferring power to long distances when a weaker material will not answer; and the lightness, durability and cheapness of the rope are important factors for the mechanical engineer to consider. For a country like California, having abundance of water power, and where it is often impossible or inconvenient to utilize directly the power near the water, which in manufacturing, such a system of transmission is especially valuable. The principle on which it depends is either to use a large rope working at a low speed, or what is better, a small rope working at a great velocity.

In order to illustrate telodynamic transmission, I will discuss an ideal case: Suppose it is desired to transmit 200-horse power from the vertical shaft of a turbine at *A*, 250 ft. to a bluff, *C*, 300 ft., and thence across a valley 1,000 feet, from *D* to some convenient point, *B*, for a mill. Required:

(1). The size of the rope necessary to convey the given power.
(2). The diameter of the pulleys.
(3). The length of rope.
(4). The loss of power.

(1). The Size of the Rope.

Allow a velocity of 5,280 ft. per min., or 88 ft. per sec. The work performed is

$$L = Pv = 550 \times H\ P;$$

From which the resistance, $P = 550 \times 200 \div 88 = 1{,}250$ lbs. The ratio of the tensions on the driving and driven portions of the rope due to the resistance to slipping is $P_2 \div P_1 = 2$; and since the driving force of the rope is the difference of tensions, $P = P_2 - P_1$ or $P_1 = P$, and $P_2 = 2P$. A rope must be selected which is capable of sustaining the greatest tension, $P_2 = 2P = 2{,}500$ lbs. According to Mr. A. S. Hallidie, an iron wire rope of $2\frac{1}{4}$ in. in circumference, or a diameter of .716 in., is required for a working load of 2,500 lbs.

(2). The Diameter of the Pulleys.

The rope is subjected to two different straining actions. Besides the longitudinal tension due to the work transmitted and the weight of the rope, there are stresses due to the bending of the rope over the pulleys.

Z = diameter of each wire composing the rope.
p_t = greatest working stress due to the longitudinal tension of the rope.
p_b = corresponding strain due to bending.
T = total longitudinal tension of the rope.
m = number of wires in the rope.

For the stretched wires in passing over a pulley,

$$p = p_b + p_t.$$

The bending moment is given by the well known relation,

$$M = \frac{E\,W}{R},$$

In which E = modulus of elasticity of the material bent, W = moment of inertia, and R = radius of the pulley. The strain on the remotest fiber from the neutral axis of the wire due to bending is

$$p_b = \frac{Z\ M}{2\ W}$$

Substituting the above value of M, we have

$$p = \frac{Z\ E}{2\ R}$$

The total longitudinal tension is the tension on a unit area multiplied by the sectional area of the rope; or

$$T = p_t \times \frac{Pi\,Z^2\,m}{4}$$

From which

$$p_t = \frac{T}{\frac{Pi}{4} Z^2\,m}$$

Substituting the values of p_b and p_t just deduced in the equation $p \times p_b + p_t$, we have

$$p = \frac{T}{\frac{Pi}{X} Z^2\,m} \times \frac{Z\ E}{2\ R}$$

Hence

$$T = \frac{Pi}{4} Z^2\,m\ \left(p - \frac{Z\ E}{2\ R}\right).$$

To find a value of Z when T is a maximum, place the first differential coefficient of T with reference to Z equal to zero; or

$$2\,p\,Z - \frac{3\,Z^2\ E}{2\ R} = 0; \quad \text{or}$$

$$Z = R \times \frac{4\ p}{3\ E}$$

For wrought iron, p = 24,000, and E = 29,000,000; hence

$$Z = \frac{R}{900}$$

For a rope of .716 inches in diameter Z = .0699 inches, very approximately. Therefore, the radius of the pulleys is 5.24 feet for the minimum limit. To be on the safe side, increase R to 7 feet.

(3). The Length of the Rope.

The general equation of the catenary curves formed by the rope is

$$y = \frac{c}{2}\left(e^{\frac{x}{c}} - e^{-\frac{x}{c}}\right)$$

in which y and x are the general co-ordinates of points of the curve, c, some constant, and e, the base of the Napernian system. Developing $e^{\frac{x}{c}}$ and $e^{-\frac{x}{c}}$ into a simple form, we have

$$e^{\frac{x}{c}} = 1 + \frac{x}{c} + \frac{1}{1.2}\left(\frac{x}{c}\right)^2 + \frac{1}{1.2.3}\left(\frac{x}{c}\right)^3 + \text{etc.}$$

and

$$e^{-\frac{x}{c}} = 1 - \frac{x}{c} + \frac{1}{1.2}\left(\frac{x}{c}\right)^2 - \frac{1}{1.2.3}\left(\frac{x}{c}\right)^3 + \text{etc.}$$

By the substitution of these values of $e^{\frac{x}{c}}$ and $e^{-\frac{x}{c}}$ in the general equation, and rejecting all the higher powers of $\frac{x}{c}$ which we may do without sensible error provided $\frac{x}{c}$ is a small fraction, we have

$$y = +\frac{x^2}{2c}$$

Thus it is seen that the equation of the catenary is approximately the equation of an inverted parabola referred along its axis to an origin at a distance, c, below the vertex. Hence, the vertex is determined by the equation

$$h + c = \frac{c}{2}\left(e^{\frac{x}{c}} + e^{-\frac{x}{c}}\right)$$

or approximately by

$$h = \frac{a^2}{2\,c}$$

in which h is the distance of the vertex below the horizontal line connecting the points of suspension.

The general equation for the deflection in terms of l, the length of the curve from one of the points of suspension to the vertex, and c is

$$h + c = \sqrt{l^2 + c^2}$$

from which

$$l = \sqrt{h^2 + 2\,h\,c}.$$

If K = tension in a tangent at any point of the vertical tension, V = q l, and a horizontal tension, H = q c; q being the weight per lineal foot of the rope. From the preceding, $K = \sqrt{H^2 + V^2} = q\sqrt{c^2 + l} = q(h + c) = q\left(b + \frac{a^2}{2h}\right)$

It is evident that the tension at *D* is greater than the tension at *A*; and if the power was transmitted from *A* to *D* direct, the tension at *D* would be greater than the selected rope could stand with safety. In order to reduce the tension at *D* as much as possible under the circumstances, place at *C*, to carry the driving and driven portions of the rope, two parallel guide pulleys, as close together as practicable, in such a manner that their lower rims shall be at the same hight as the horizontal pulley at *A*. Also place two parallel guide pulleys as near as possible to *A*, so that the rope can lead fair on and from the groove in the rim of the horizontal pulley, and two at *D* that the rope between *C* and *D* may hang perfectly vertical.

Since the tension on the driving and driven ropes changes when the system is in motion, it is evident that the catenary curves will change. We will now consider their positions when the system is at rest and when in motion:

P_0 = tension at *A* and *C* when at rest.
P_1 = tension on driven side.
P_2 = tension on driving side.
h_0 h_1 and h_2 = corresponding position of the vertex below the horizontal.

$P_0 = \frac{P_2 + P_1}{2}$; but $P_1 = \frac{P_2}{2}$; hence $P_0 = \frac{3}{4}P_2$. $P_2 = 2500$ lbs; and q = .86 lbs. From $P_0 = q\left(h_0 + \frac{a^2}{2h_0}\right)$, $h_0 = 4.18$ ft. The tension being the same for the two catenaries between *A* and *C*, the vertices will be at the same distance from the horizontal.

When in motion the tension, P_1, on the driven side, is 1,250 lbs., and $h_1 = 5.40$ ft. $h_0 = \frac{h_1 + h_2}{2}$; whence $h_2 = 2.96$ ft., for the vertex of the driving catenary.

The length of one of the catenaries, from one of the points of suspension to the vertex, when the system is at rest, is $l = \sqrt{h^2 + 2\,hc}$. $c = \frac{a^2}{2h} = 1{,}869.13$ ft., and $l = 125.1$ ft. Hence the total length of rope required for the two catenaries is $4l = 500.4$ ft.

Again let
T = tension at *D* and *B* when at rest.
T = tension on driven side.
T = tension on driving side.
M_0, M_1 and M_2 = corresponding positions of the vertex below the horizontal. The weight of the 300 ft. of rope between *C* and *D* is 258 lbs.; consequently $T_2 = 2{,}758$ lbs., $T_0 = \frac{3}{4}T_2 = 2{,}08.5$ lbs., and $c = 2{,}228.51$ ft., which gives $M_0 = 141.35$ ft.

When in motion, the tension on the driven side is 1,508 lbs., and $M_1 = 179.6$ ft. M_2, the deflection due to T_2 is 103.1 ft. $l_1 = 812.39$ ft., determined as before, and the length for the live catenaries is $4l_1 = 3{,}249.56$ ft.

The rope may be considered, without sensible error, as embracing one-half the circumference of the pulley at *A*, and one-half at *B*; the remaining pulleys, being simply guides, do not affect the length sensibly. The total length of rope required is therefore

$$s = 2Pi\,R + 500.4 + 600 + 3{,}249.56 = 4{,}393.94 \text{ ft.}$$

(4). The Loss of Power.

Experience shows that only the friction of the shafts of the pulleys on the bearings diminishes the power in wire-rope transmission. Allowing a pressure of 4P on each shaft, and a coefficient of friction of .1, the loss of power amounts to 9 H. P.; the available power is therefore at least 95%.

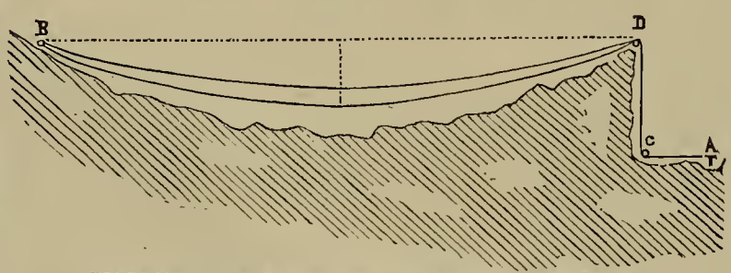


DIAGRAM ILLUSTRATING TELODYNAMIC TRANSMISSION.

Wonders of Venus.

Many who admire the beautiful star which now adorns the western sky until more than three hours after the commencement of twilight, may not be aware that its splendor is derived from the sun; that in it, like on the earth, night curtains the landscape, morning dawns and seasons in quick succession come and go. Lofty mountains show that forces similar to those which upheaved the Alps and lifted the summits of the Andes above the regions of eternal snow, have ridged its surface and covered it with hills and vales. Variable spots prove that clouds float in its atmosphere, and gleams of light, which dart across its sky, afford evidence that in it lightning seams the sky and the thunder's roll reverberates through the valleys.

But 300 miles less in diameter than the earth, and revolving on its axis in nearly the same time, Venus makes thirteen revolutions around the sun while the former makes eight. As the inclination of the planet to the plane of its orbit is at least 54°, its torrid zone is double that extent, or 108°, and its polar circles 54° from the poles. It therefore has two frigid and a torrid, but no temperate zone. Since the sun must arrive at the equator and depart from it to the distance of 54° twice in each of its years, there must be two summers and two winters annually in the torrid zones and a winter and a summer in each of the frigid. Venus becomes the morning star after its superior conjunction, when it appears, through the telescope, crescent-shaped like the new moon. The orbits of this planet and of Mercury are within the orbit of the earth, and consequently they are never seen in opposition to the sun, that is in the east when the sun is in the west, or in the west and the sun in the east. At its inferior conjunction, Venus is nearer to the earth than any other planet except the moon, and sometimes when approaching the greatest distance, when it seems to recede from the sun, casts a shadow and is visible in the full light of day. If at the period when it is nearest to the earth, the enlightened part were fully turned toward the latter, this planet would appear twenty times as brilliant as it now does and almost vie with the moon in dissipating the darkness of night. Being situated at about one-third less distance from the sun than the earth, Venus receives more light from that luminary than is received by the former planet, and seems not to require the aid of the moon. Nevertheless, several astronomers have affirmed that they have noticed such a body, and have even gone so far as to calculate the orbit of the supposed satellite, but their observations have not been verified.

The transits of Venus, or its passage between the earth and the sun, when it appears as a round dark spot moving slowly across the solar disc, have been made to assist in determining the distance of the earth from the central luminary. The last transit occurred in December, 1874, and the next will take place in December, 1882. As this can be viewed in the United States it will awaken a greater interest than the transit which Rittenhouse and others observed more than a century ago. But four transits of Venus have been observed, and after 1882, $121\frac{1}{2}$ years will elapse before the alternately morning and evening star will pursue its seeming pathway across the surface of the great orb of day.—*Albany Journal.*

PHOSPHORESCENCE.—MM. Bancel and Husson have communicated to the Academy of Sciences observations on the phosphorescence of the flesh of the lobster. They consider it due to a fermentation in which carbo and phosphohydrogens are liberated, and which is destroyed by putrefaction, just as the bacteria of carbuncle are destroyed by the vibriones of putrefaction.

Australian Gold Fields.

The last Australian mail brings news of a discovery in one of the several mines at Ballarat, which bids fair to be of the greatest importance to the future prospects of the district, hitherto the most valuable alluvial gold field in the colony. The discovery was the finding of an extensive quartz reef in the claim of the Band and Albion Consols Company. The mine owned by that company has in the past yielded grand returns of gold from its alluvial washes, and the new quartz reef was found at a time when it was thought the rich alluvial ground was almost worked out. The first returns obtained from the reef, which was stated to be 20 feet thick, were at the rate of 12 dwt. per ton, but they speedily improved, until 350 ounces of gold were obtained from 250 tons of quartz. The following fortnight's crushing of stone was still better, 464 ounces of gold being obtained from 176 tons of stone, and the yield for the last fortnight was 396 ounces 12 dwt. The good effect of the discovery on the spirits of miners and those who are interested in mining property has been magical, and all the unoccupied land under which the new reef is supposed to run has been eagerly sought after for mining purposes. It is hoped, indeed, that Ballarat may yet prove to be as rich in auriferous quartz as it has hitherto proved in gold-bearing alluviums. The value of the discovery, so far as the claim itself is concerned, may be understood when it is stated that the shares of the company are now selling at five times the price they were disposed of only about six weeks ago. The mine is situated in Ballarat West, but the progress of quartz mining in Ballarat East is also very satisfactory. The Queen Company, a tribute from the Black Hill Company has struck a good body of stone, while the Sulieman Pacha has also come across a promising run of stone at the 300 level, on what is known as the Old Prince of Wales line of reefs, and near where the celebrated Welcome nugget was found. Other claims in the neighborhood are also stated to be doing well. At Beaufort, work is proceeding on many of the claims recently started there, and it is now probable that this long-neglected field will have a chance of being thoroughly developed by the influx of outside capital. An alluvial gold field was found about three weeks ago near Dunolly, which promises to be one of the best discoveries of the new ground that has been announced for a long time past. Nuggets of various sizes, from eleven ounces downwards, have been obtained is some of the claims at a rush, and a large number of miners have taken up ground wherever it is thought the gold will be found. At Stawell, one of our principal quartz mining districts, mining is said to be improving from the dullness which has pervaded it for the past few months. Only last week a kiln of 1,111 tons from the Oriental mine there produced the splendid yield of 3,480 ozs. 11 dwts., or an average of about 3 ozs. 3 dwts. per ton. The company had then 600 more tons of the same kind of stone ready towards another kiln. The miners of the Pleasant Creek Cross Reef Company, whose claim has, so far, been one of the richest worked in the colony, believe that the reef which gave the Oriental crushing just mentioned is close to their boundary, and if that be so, the mine is likely to be very rich indeed, there is nothing of special importance recorded in connection with the other gold fields of the colony, but work, however, is carried on steadily in all of them, and it is believed the yields are keeping up to the average.

DIFFUSION OF LIQUIDS.—In the course of a recent lecture at the Royal Institution, Sir W. Thomson made some experiments to show the extreme slowness of the diffusion of liquids. He exhibited tubes filled nine days previously, which in the upper part contained one fluid, and in the lower another, such as a solution of sulphate of copper, a solution of common salt, colored alcohol, etc. A mark where the two fluids met was registered at the time the tubes were filled, and in the nine days the diffusion had not extended upwards and downwards more than two or three inches. In a lecture-room at Glasgow a tube about 30 feet long was filled some years ago, and from the rate of diffusion it has been calculated that complete interfusion of the two liquids will occupy nearly 1,000 years.

CHARLESTON PHOSPHATES.—The rocks are of various sizes, from that of a hickory nut to a peck measure, and, although most of them are embedded in a tenacious clay or marl, at various distances from the surface, rarely exceeding ten feet, a considerable quantity lies loosely above ground, and until their true nature was discovered, a dozen years ago, were regarded as a great disadvantage to the land by the owners. They were detested by the farmers, like our northern drift rocks, which interfere with easy cultivation. These rocks extend over an immense area—hundreds of thousands of acres—and practically the supply may be said to be inexhaustible.

FRENCH CABLE.—The cable steamer *Faraday*, having laid the shore-end of the new French Atlantic cable from the coast of France, has returned to England to take on board the shore-end of the cable to be laid on this side, which she will at once proceed to lay down. The telegraphic journals express considerable doubts of the financial success of this undertaking, contending generally that there are already more transatlantic cables in operation than are required for the needs of business.

Aluminum and its Applications.

In an article contributed to the *Industrie blatter*, Mr. Clemens Winkler gives a history of the development of the art of working aluminum, as evidenced in the displays at the three international exhibitions at Paris. In 1855, aluminum was shown for the first time, at the Palais de l'Industrie, as a large bar, to which the extravagant name of "silver from clay" was given. In 1867, it appears again, but worked up, and betraying the manifold difficulties which had been overcome in its production on a large scale, its purification and its molding. It was exhibited in the form of castings, sheet wire, foil or finished goods, polished, engraved, soldered, and for the first time, and in varied forms, its most important alloy—aluminum bronze—was shown. After the lapse of almost another dozen years, the Paris exhibition offered, in 1878, evidence of the maturity of the aluminum trade. The time when aluminum was worked up in single specimens, showing the future capabilities of the metal, has passed, and now it has become an article of current manufacture, having a regular supply and demand, and being in some regards commercially complete.

The fears entertained as to the future of aluminum is thus seen to have been unjustified. The manufacture of aluminum and of aluminum goods has certainly not grown as rapidly as was hoped. The lowest limit of the cost of manufacture was soon reached, and aluminum is still a product extracted only by a series of expensive operations from one of the cheapest and most common of raw materials. On the other hand it is steadily displacing for a variety of purposes other cheap metals, over which it is seen to have incontestable advantages. Its color and luster are pleasing, while its peculiar lightness fits it in an unrivaled manner for many purposes, both of science and luxury. This low density has to be taken into account when the price of aluminum is compared with that of other metals, since it occupies, weight for weight, three times the space of iron, copper, brass and nickel, and four times that of silver.

To France is due the credit of having been the first country to carry out Wohler's process for the production of aluminum on a practical scale, and to have created the aluminum manufacture. France still seems to be the only country in which the manufacture is able to prosper. The English manufactory established at Washington, near Newcastle-on-Tyne, by Bell & Co., did not answer, and has been closed for about five years. The German manufactory set up at Berlin by Wirtz & Co., drooped before it was well started. In France, the great chemical manufactory of H. Merle & Co., in Salindres, near Alais, carries on the extraction of aluminum, and the Societe Anonyme de l'Aluminum in Nanterre (Seine), works up the metal into the various forms demanded by commerce. Both firms were represented at the exhibition. Merle & Co. had a splendid display of bars of the metal, while the Societe Anonyme exhibited samples of finished goods of all kinds, showing the progress made in its adaptation to various purposes. But for this it would not have been possible to exhibit reels of brilliant wire, fine as human hair, or beautiful sheets of extraordinary ductility. There were also exhibited stampings in aluminum—large medallions and pieces weighing exactly one gramme, to show the lightness, compared with the bulk of the metal. In one pan of a balance there were shown five large keys made of aluminum, which were counterpoised by a single iron key in the other pan. The peculiar bluish-white luster of the metal also compared to advantage with the use of tin and zinc. The beautiful objects made with great skill of aluminum bronze, and sold at very cheap rates, are more popular than those made in pure aluminum, which is relatively dearer. Small articles of aluminum only are found to sell; among them may be especially named some pretty specimens of fine wirework. It is getting to be a common thing in Paris to make the frames for opera glasses and telescopes of aluminum. Houses which cultivate this branch of manufacture with success are Clermont, Lemair and Fischer. Still successful as is this application of aluminum, it is, perhaps, not the most favorable one. The most rational use indicated for aluminum, by reason of its low specific gravity, is the making of beams for balances. Aluminum bronze beams have been made for several years past; but, so far as lightness of metal is concerned, they have scarcely any advantage over brass. Sartorius, of Gottingen, was the first who made light and unalterable beams of an alloy of aluminum with 4% of silver. He has had but few imitators. The exhibition contained but one single balance the beam of which was made of pure aluminum.

This balance was exhibited by M. Collot; it carried 100 grammes, turning at 0.1 milligramme; its price was set at £80. There are several reasons for the small amount of favor shown to aluminum by mathematical instrument makers and others. First of all there is the price, then the methods of working it are not everywhere known; and further, no one knows how to cast it. Molten aluminum attacks the common earthen crucible, reduces silicon from it, and becomes gray and brittle. This inconvenience is overcome by the use of lime crucibles, or by lining the earthy crucible with carbon or strongly burnt cryolith. If any one would take up the casting of aluminum as a current industrial operation, there is no doubt the metal would be more freely used in the finer branches of practical mechanics.

Useful Information.

Coal Smoke.

Every one that has observed a soft coal fire, says the *Coal Trade Journal*, knows that the greater part of the black smoke that is sent off is because of the careless and ignorant way of feeding the fire. It is the same in steam boiler furnaces, in heating furnaces, in kitchen stoves, and parlor fireplaces. Also everyone that has tried it has found that to make workmen or workwomen feed the fire intelligently so as to burn this smoke, exceeds the power of the employer and housekeeper, even if the employer is not too careless to do it when he or she tends the fire.

In the case of steam boiler furnaces, as we have before times shown, the excuse for shoveling the fireplace full of coals is that the volume of cold air let in under the boilers, by opening the furnace doors to feed little and often, would defeat the economy. This is but partly true. The ease of feeding in the bulk way is the principal reason, and the average workman regards any increase of his care in order to save expense to his employer as an imposition on the workingman. If women think it any easier with their help, let them try it with their Biddies and Gretchens, and see if they do not soon find that this is too great a disturbance to bear for what they can do in the smoke of reform.

They will find the same in feeding their open fires under their own noses in the parlor, and that even themselves, their husbands, boys, and relations will rather put on a lot of coals at once, and let them send off a black smoke for a quarter or half an hour before getting well ignited, than take the trouble of putting on a little at short intervals. But this easy conclusion on the part of all is what makes the bulk of our smoke.

In the case of steam boiler furnaces, this inability to get any care or intelligence or stoking has not even attempted to make such a feeding place by which the coals could be placed on the fire without letting in the cold blast. Yet any mechanic will say this is practicable.

Our information is that most of the burning of the smoke which has been accomplished in London is by the manner of feeding the fire. All know that if a small amount of coal is placed on a bright fire, the smoke is mostly burned. On the other hand, they know that if a large quantity is put on a considerable part is sent off in thick smoke before the fire recovers enough to burn it. All can see that if an apparatus were contrived at the mouth of the furnace, to place the coals regularly according to the rate of consumption on the bright fire, most of the smoke would be burned. And any mechanic will say that such an apparatus can be made to do this without letting in a cold air blast.

But it is requisite that this should be made to work with machine regularity, if not automatically, so that neglect and indifference and laziness shall not find it easier to stow in bulk. All will agree that it is entirely practicable to make such a feeding apparatus at no great expense. And there can be no doubt that the saving thereby would make it profitable. The expectation of some chemical mixture, or of some machine by which smoke shall be made so inflammable as to burn itself, will probably be disappointed, but at any rate the reduction of the smoke nuisance by a sub-division of the coal in feeding the fire is entirely practicable, and it appeals to every one's common sense.

The Manufacture of Ice in the South.—Few people have a correct notion of the extent to which artificial ice is being manufactured in the South. The success of the process employed has been so marked that from Florida to Texas the machines are being put in operation at frequent intervals. The actual cost of manufacturing ice on the St. John's river is said to be but 70 cents a ton, including the storage and delivery. As Northern ice used to retail at from $10 to $15 a ton there, it is plain that a handsome profit remains for the manufacturer after putting his price as low as to drive all natural competition from the market. One of the "Arctic" machines, in which ammonia is used to do the freezing, turns out ten tons of ice daily, in the form of blocks, about two and a half feet long, and ten inches in thickness. The congealation is perfect, and many are said to prefer ice thus made to that formed in the laboratory of nature.—*Savannah News.*

Photographing Seals.—A photographer in Germany has made seals and stamps with the portraits of his customers. A thin layer of gelatine sensitized with bichromate of potash is exposed to the action of light under a photographic positive, by which the parts acted upon are rendered insoluble in water. The gelatine film is immersed in water, and the parts not acted upon by light swell up, and we obtain a picture in relief, of which a plaster cast can be taken. A galvano-plastic copy being taken of the cast, we have a metallic fac-simile of the photograph, which can be employed as a seal.

Acids and "Granite" Ware.—A correspondent of the *Druggists' Circular* writes as follows: "I have discovered that oxalic acid is very destructive to the enamel of the granite iron ware. Perhaps the knowledge may be of use to druggists and others using it. Another objection is that it scales off, leaving the iron exposed, which colors some preparations."

Japanned Wares in England.—The chief seat of the manufacture of the lacquered, or so-called japanned, ware in England is at Wolverhampton, where at least 100,000 trays and waiters are turned out in a week, when trade is good. Most of these, however common, used to be painted by hand, with astonishing celerity of execution. It was said that a "skilled artist" could with ease paint two gross of landscapes in a day. Most of this common decoration is now effected by the new method of transfer printing, for which, probably, porcelain decoration suggested the idea. The pattern or picture is printed by the lithographic process on line tissue paper, which is laid face downward on the japanned plate, and adheres to the sticky varnish with which it has been treated. After a time, the paper can be wiped off, but the colors remain, and are afterwards fixed by stoving. A new decorated tin has come into the market printed in the sheet, it is said directly on the metal, with such permanency as enables it to be made up afterwards into canisters and other articles without injury, and this has very much cheapened the production of those articles.

Preparing Crystals.—For preparing regular crystals of any size, the *Archiv des Pharmacie* gives the following directions: "You make a solution of the substance, of such concentration that, after 24 hours, a part of the salt becomes separated in crystals. Take some of the finest of these crystals and place them on a glass in a vessel which is higher than it is wide. Dissolve a little of the dry saline mass in a quantity of the mother-water; add this solution to the whole of the mother-water; then sprinkle with this liquor the crystals placed on the glass plate. After about 12 hours separate the liquid, and dissolve in a small portion of it, again, a little of the dry salt; mix the solution with the mother-water, and pour the whole on the crystals on the glass. You repeat this operation every 12 hours, until the crystals have acquired the size wished. The vessel containing the crystals, preferably, be placed in the cellar."

Igniting Tinder, etc., by Compressed Air. The common experiment of igniting tinder by compression in a glass tube does not always succeed; the tinder may not be ignited, or may not retain its glow, after the piston is withdrawn. Tyndall uses sulphide of carbon vapor instead of tinder. Hofmann says both may be advantageously replaced with gun-cotton. A little ball of this, the size of a pea, always ignites, with lively flame, visible to a distance. The experiment might be dangerous if large quantities of the substance were used; but, in the way indicated, it is not. Gunpowder may also be used for the experiment; but it does not ignite with the same certainty.

To Produce Cold by Vaporization of Ether.—Prof. Hofmann, in a communication to the Berlin Chemical society, recommends for this purpose placing a test tube half-filled with water in a cylinder containing ether, so that the ether reaches somewhat above the surface level of the water. A current of air being sent through the ether, the water is soon changed into a transparent cylinder of ice.

Kerosene for Softening Leather.—It is said that kerosene will soften boots or shoes which have been hardened by water, and render them as pliable as when new; but we fear that it will injure the leather. Castor-oil, long ago commended in the *Journal*, is doubtless better. —*Boston Journal of Chemistry.*

Good Health.

The Ammoniacal Sulphate of Copper in Tic Douloureux.—Dr. Fereol, of the Lariboisiere, has met with an amount of success in the use of this almost forgotten remedy in four cases of old and obstinate tic douloureux, that leads him to believe that it is one to which attention should again be drawn. He prefers the fluid form, as in the following mixture: Distilled, water, 100 grammes; syrup of orange or mint, 30 grammes; and ammoniacal sulphate, from 10 to 15 centigrammes. This is to be taken chiefly at meal-times, within the 24 hours. If the neuralgia persist, the dose may be gradually increased; and in one case as much as 60 grammes per diem was given, but then began to cause gastro-intestinal disturbance. Even in the ordinary dose, after two or three days, fetid breath and a metallic taste may be perceived; but, in spite of this, the medicine must be continued at 10 centigrammes per diem for 12 or 15 days, especially at meal-times.

Transformations of Nervous Phenomena. In reviewing the affections and the nervous phenomena which are propagated by a transmission and a transformation of motion, from simple yawning to epilepsy, fascination, panic, etc., J. Ramhosson formulates the following general principle: A purely physical movement may be transformed into a physiological and into a psychic or cerebral movement by simple transmission to special portions of the system, and reciprocally, a pyschic movement can be transformed into a physiological and into a physical movement by simple transmission to a different portion of the system, and that without losing its character; for it reproduces the same phenomena, after all these transmissions and transformations.—*Comptes Rendus.*

Bandaging in Migraine.—Dr. Weir Mitchell (in the Boston *Medical and Surgical Journal*), relating a case of migraine occurring in a girl seven years and a half old, exhibiting the congestive type, and for which he prescribed small doses of bromide *(gr. iij.)* and tinct. belladonnæ *(gtt. iij.)*, observes that the use of the old domestic remedy, a tight bandage, during the attack, is useful. He employs a rubber bandage, applied thoroughly from eyes up with a thin pad over each temporal artery, if the temporal ridge be sharp enough to keep the bandage from squeezing the arteries, and over the two occipital vessels. Instead of caoutchouc, a well applied muslin bandage may be put on, and then wetted, using compresses over the temporal arteries. The comfort thus given is sometimes surprising. He adds: "I need not say that migraine in some of its forms become at times—and especially in women—a most disabling malady, and may recur daily, until life is a burden impatiently borne. These are usually cases of thin-blooded and thin people, whose sufferings are brought back by the attempt to take exercise, without an abundance of which a return to health is out of the question. I have seen some such cases in which a cure little less than marvelous has been made by the use of absolute rest, over-feeding and massage. There is, of course, much more to be said on the therapeutics of megrims, but no one drug is its master. The hint as to thorough bandaging is worth remembering, and especially at the close of a headache."

Sun Cure.—Says the Cincinnati *Artisan:* A warm and dry atmosphere is not unwholesome, but when cloudy or rainy weather brings a sultry air which dampens everything around us, the atmosphere may be loaded with germs of disease, and fire is needed to destroy them. The walls, the ceilings and the floors of apartments should never be allowed to become damp. Sometimes, when the warmth of the air is oppressive, fire is more necessary to preserve health than it is at another season to protect us from the cold of winter; and the rooms of a dwelling should never be left without the means of warming and drying. Investigations have shown that many of the most fatal diseases are caused by the germs of vegetable and animal life, and that a humid atmosphere is most favorable for their propagation. It is, therefore, neglecting to avail ourselves of the great discoveries of the age, and failing to protect ourselves from the scourges which so fearfully afflict families, when we ignore the dangers which surround us. Apartments exposed to the full action of the sun may be less comfortable in hot weather than those from which the sun's rays are excluded, but they are more wholesome, and when contagious diseases prevail in closely-built cities, it is found that the inmates of houses on that side of the street exposed to the sun are less liable to be attacked, while the greatest number of sick are always found where there is the least exposure to the rays of that great disinfector—the sun.

The Tongue and the Sense of Taste.—The tasting power of the tongue is not regularly distributed over all parts of that organ. According to the unanimous judgment of physiologists, the back part of the tongue is best qualified for this function, while there is a difference of opinion as to the tip of the tongue. The older observers have repeatedly said that a tasting power in the tip is limited to certain persons, whereas more recent ones affirm its presence in all men. In experimenting on the so-called "reaction-time," Herr Vintschgan lately met with a case of limited tasting power in the tongue-tip, and this led him to a thorough investigation of the subject. The observations were made with solutions of chloride of sodium, sugar, quinine and citric acid. The results were as follows: There are persons who are capable of accurately distinguishing all principal tastes with the tip of the tongue alone; others perceive with certainty the qualities of sweetness, saltness, acidity, but less distinctly bitterness. Others, again, can only with great difficulty distinguish tastes with the tip of the tongue; and, finally, there are individuals who cannot do this in the least.

Borax and Niter for Hoarseness.—*La France Medical* remarks that these two salts have been employed with advantage in cases of hoarseness and aphonia occurring suddenly from the action of cold. The remedy is recommended to singers and orators whose voices suddenly become lost, but which by these means can be recovered almost instantly. A little piece of borax, the size of a pea, is to be slowly dissolved in the mouth ten minutes before singing or speaking. The remedy provokes an abundant secretion of saliva, which moistens the mouth and throat. This local action of the borax should be aided by an equal dose of niter, taken in warm solution before going to bed.

Hygiene vs. Long Trains.—The municipal authorities of Prague have, at the request of the Board of Health, interdicted the wearing of dresses with trains in the public streets, on the ground that the dust raised by those appendages is injurious to health. In Algeria the clouds of dust raised by the incessant sweeping of the long skirts of the ladies produce on the legs, when bathed with perspiration, an irritating pruritis and eruptions, which are only partially relieved by baths and a scrupulous attention to cleanliness.—*Exchange.*

MINING AND SCIENTIFIC PRESS.

W. B. EWER.....SENIOR EDITOR.

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The Week.

The week has not been remarkable for any very great diversity in stocks. An apathy has seemed to prevail out of which the market could not be roused. A strong disposition has been manifested to compel investors to purchase upon mere individual representation, a policy which will not prevail for the reason that sad experience has demonstrated too often that dishonest transactions are covered up by an air of mystery. The public are becoming weary of the continual talk about "expectations" in the flooded mines of the Comstock, and seem to realize that perhaps the anxiety to free the mines of water is not so great as it should be. Probably the instinctive doubt whether the removal of the water will disclose anything more of value, has something to do with the mysteries now enshrouding the operations. The Comstock market has evidently lost tone considerably, and, for all we now know, may never be brought above the level at which it stands. It is quite true that the Washoe bullion product has been equal to double the amount of assessments, but this spread over many years will not amount to more than an ordinary percentage on the money invested. It is, perhaps, just as well to come down to hard facts and say that the total dividends from the Washoe district has been $114,589,700; assessments, $54,865,635; leaving $59,724,065 profit. A little more than 100% which, distributed over 20 years, which is about the length of time the Comstock has been in operation, would make an interest of about five, at most six per cent. Not so very much after all. The immense fortunes realized have not been acquired on this income, that is patent. Now, how did some of our noted manipulators get their millions? By stock-gambling, or by straightforward business transactions? Every man must judge for himself. All these hard facts are becoming known, and hence no surprise need be felt on any loss of "tone."

Prehistoric Researches.

The vast physical changes that have occurred on the surface of the earth within the memory of living men, and the elevations and depressions taking place at the present moment, has more to do with the solution of the theoretical problems concerning man's antiquity that have been presented to our notice at various times, than would be naturally supposed by the casual reader.

The evidences of the prehistoric existence of man in Europe and America consist of relics of various rude manufactures, such as rough pottery; stone implements, broken bones, and shell heaps; of rough drawings of extinct animals, and of human fossils, either in ancient geological strata or in connection with the remains of certain extinct animals. The human period is divided into three ages, designated by the kind of material used in the manufacture of weapons and implements, as the Stone, the Bronze, and the Iron ages. The Stone age is also divided into the Paleolithic, the Reindeer, and the Neolithic eras. The first of these indicates a time when the manufactured implements were rudely made of unpolished stone; in the last they were of polished stone, with other evidences of a more advanced state of civilization. The Reindeer era seems to have been a period when a second glacial condition drove the animals and people of Northern Europe southward, where many of them left their remains embedded in the sedimentary deposits of that time. Some of the oldest relics of man are found in certain peat-beds of Denmark. These vary in depth from ten to thirty feet. In these, at various depths, are found embedded the fallen trunks of different kinds of trees.

Other memorials of man's early existence are found in the shell heaps or mounds of Northern Europe, and found likewise in many places in the United States. The connection of the human remains and the shellfish of the period are regarded as evidence of contemporaneousness. Certain bones have been found bearing marks and scratches that have been thought to be the product of human hands. Rudely-chipped bits of flint supposed to be hatchets, knives, spearheads, etc., are found in great quantities in many places. These are associated with the fossils of an extinct elephant, rhinoceros, lion, and cave hyena, besides those of some animals yet living. It has been supposed that the juxtaposition of the bones proves that man was contemporaneous with the other animals named. But there are many doubts about the nature, relations, and time of life of these flint chips. Some maintain that they are not of human workmanship at all, but only the result of the action of frost on the quartz rocks. Others admit their human origin, but claim there is no satisfactory evidence that human beings lived at the time the animals did.

These remains are generally found buried deep in the earth, either commingled or lying in distinct but proximate strata, or in surface locations. In both cases in or near the old bed of a river, with every indication that in the first case the remains were deposited under the violent action of water, occurring at different periods, and in the latter case the overlying strata of detritus have been washed away, leaving the remains exposed to view. Animal remains, as of buffaloes, have been found in Colorado and other places contiguous, where whole herds have been engulfed by the action of some cloudburst or land slide, and it needs only a few human remains and implements deposited there by some previous or subsequent similar convulsion of nature, to justify the contemporaneous theory.

It will not do to relegate all of these evidences of man's antiquity to some date in the vast geological past, for we may logically assume that the changes which operated to bury and commingle from time to time, these various strata in one common grave occurred then as they do now, and in the same manner and in less time than now, because the configuration of the geological features were more prominent and more liable to the action of the elements. Many gradual elevations and depressions of special localities are going on during our own age. Southern Italy has been subject to vertical oscillations of 20 feet or more within historic times. The Andes have been depressed 220 feet in the last three-fourths of a century. The northern part of Sweden is undergoing gradual elevation. Many changes of this nature are now going on at various localities along the eastern coast of North America. More sudden changes, that produce greater changes in a few hours than the above noticed will in as many centuries, have occurred in quite recent times. We have seen the whole coast of South America lifted up 10 or 15 feet and let down again in an hour. During an earthquake in 1819, 2,000 square miles in Southern Asia sank and became an inland sea, while adjacent to it a belt of country 20 miles long and in places 10 broad was lifted up 10 feet above its former level. With regard to the coast on the Baltic, we have evidence of a very important depression since the existence of man. While digging a canal near Stockholm the workmen came upon a fishing hut at a depth of 60 feet. And as this subsidence is still going on, it seems to stand in corroboration of the theory that at no very distant day, as compared with the lapse of time claimed by some, that region stood many feet higher than at present.

Mining Business in Quarantine.

It must be apparent even to a superficial observer, that the business of mining, although widely different from most kinds of business, may be as wisely and as honestly conducted as any other. There is no necessity for drawing the distinction between the legitimate and the illegitimate in this business, because only what is *legitimate* can be dignified by the name of *business*, all else is a dishonest swindling transaction. The speculative tendencies which surround the affairs connected with mining operations have their origin in the cupidity of man as have all other speculations, a mere wager that a certain amount of bullion will be yielded by a given mine, the quantity being gauged by the imagination of the owner. This element of chance, so fruitful of abuse, is what brings odium upon our mining operations. There are individuals who will speculate in stocks as there are those who will gamble at cards, and speculation is at best but a species of gambling. That there is rich ore in the soil of our Rocky Mountain States and Territories needs no demonstration, and the fact that the supply of bullion from our mines exceeds the amount realized from any other business, should be a patent fact to all that our estimates of mine value have not been drawn wholly from imagination. From the fact that within 20 years the world's supply of gold fell from 200,000,000 a year to an estimate of 70,000,000 during the present year, we do not infer any great disaster, Twenty years ago the demand for gold was greater than it is at the present time, besides other than mining interests have been developed to an enormous extent. We might say that when the same requirements exist in future, as existed in the past, the supply of gold will be increased. It is not strange to us that Russia should now come to the front as a gold producer. That nation has arrived at that point in its existence, when the universal medium of exchange, gold, is essential to her existence, and, hence, her strenuous efforts to produce bullion.

The yield of bullion *per capita* of the Pacific coast is greater than that of any other country in the world, being about 40 times that of Russia, or taking the whole population of the United States as a basis, it would be twice that of Russia. There is a large margin here, in favor of our bullion yield, which the demands of commerce will increase when necessary.

It is certainly true that our precious minerals have built an empire on this coast, but precious minerals alone will not maintain it. There are other elements of fully as much importance to society as gold production, which other elements are essential to our mining business, as is our mining business to them. The agricultural interests of the coast are large, and our productions from that source have realized a remunerative income. Yet it would be unwise to say that agriculture alone can sustain our prestige. It is, in part, due to our gold production that we have been able to maintain our agricultural resources, and, perhaps, we may say that at the present time our agricultural resources are an aid to our bullion produce. It is certain at any rate, that gold took the initiative, and laid an enduring foundation of prosperity, and it is useless for agriculture to come in now and claim the honor. The immense tracts of land in the mineral regions are suitable for mining, and comparatively useless for any other purpose, and to mining it should forever be appropriated. That is the plain intent of our laws. Whenever agriculture and mining clash, it is a house divided against itself, and disaster may then be said to follow. It is much easier to glut the market with wheat than it is with gold, and this point should not be overlooked in any desire to make one prevail to the exclusion or detriment of the other.

Lunar Influence.

Prof. J. P. Nichal, the eminent astronomer of Glasgow, in a letter to the Boston *Journal of Chemistry* in regard to the supposed influence of the moon on the weather, says:

"No relation exists between these classes of phenomena. The question has been tested and decided over and over again by the discussion of long and reliable meteorological tables nor do I know any other positive way of testing any such point. I confess I cannot account for the origin of the prevalent belief."

The origin of the belief in the moon as an influential power over our earth must be traced to the ancient superstitions concerning the influence of the moon on mundane affairs. Many lingering superstitions have their roots in the old mythology and astrology. These died as systems long ago, but popular notions that grew out of them, still live among the illiterate in all lands, and sometimes their ghosts haunt even the educated. The changes of the moon cannot affect us in the least, because these changes occur all the time at every point of the moon's orbit. There is no powerful metamorphosis in the moon at the "first quarter," "full moon," or "new moon," any more than there is between those points. The changes in the appearance of the moon is due solely to the rays of light striking the body of the moon at certain angles or points. The moon is always the same, changes are only in the reflection of the light, and the moon itself can no more be said to change in the ordinary sense of the word than a railroad train changes when it passes a mile-post set up beside the track. The light of the moon cannot affect us because it is of such small degree—619,000 times less than the light of the sun—a lantern hung on a pole would affect us just as much. There is no heat to speak of in the reflected light of the moon, and, as is ignorantly supposed, does not produce cold. The stories of persons having distorted limbs and countenances by reason of sleeping under the rays of the moon are "mariners' tales." To assume that the influence of the moon can be perceived and understood by uneducated observers, and made a part of popular "weather wisdom" and applied to practical use by farmers, or sailors, or anybody else, while scientific observers, who have spent years of experiment and with the most delicate instruments, know nothing about it, is simply ridiculous. There is no *raison d'etre* in the phenomena attributed to the moon.

The Defrauded Element.

We have always deprecated the manifest injury to the community caused by swindling mining stock manipulations, and we contend that there is no reason why the mining business could not be carried on with advantage to the investor. Of course there are "wildcat" schemes which have no community of privilege with an honest business. There are certain badges of fraud about them which are plainly visible to the most superficial observer. But even legitimate enterprises may be manipulated for purposes of deception, so that the public are misled by an infamous cheat under the cloak of an honorable name. Laws have been enacted to protect the public from imposition, but laws do not meet the requirements. All the liquor laws in the world, combined with all of the efforts of lecturers, and the blood and tears of sorrowing women and children, have not barred one whit the progress of the evil of drunkenness, or stayed the manufacture and consumption of spirituous liquors. Nor has all the outcry against cards, faro and other games of chance abated the folly which rushes to the pecuniary destruction and even suicidal mania engendered by their abuse. Why? Because human nature and all of its susceptibilities remains unchanged. When men have been directed aright, and when the evils of a certain line of conduct is pointed out to them by a long list of experiences, it would seem as if some faint glimmering of common sense should save them from disaster. The responsibility of every individual man, arising from his influence over others, under these circumstances may be said to be released, were it not for the fact that the memory is not altogether perfect, nor the application of fixed rules governed by a sense of nice discrimination. Some go to the left intending to go to the right, governed by the same disposition which guides a man in a forest in a circle. Not entirely an unreasoning, unthinking sense of duty, but a hope that the outcome will be favorable. It is this latter spirit which has caused so much delusion, and the knowledge of which that has nourished a crop of vultures which prey upon man's natural cupidity and hopes by glittering humbugs. Let prohibitory laws come to the rescue if they can, but as long as human laws can only appeal to the senses and not affect the intelligence, just so long will there be defrauders and defrauded. The body politic has to do with the entirety of the community; and the *raison d'etre* of its laws, rules and regulations whether local or general cannot have any other object or application. Every man must reason out his affairs to his own advantage. We sorrow with the unfortunate loser in some mining swindle, but what shall we do to relieve him? Shall we imprison or kill the knave who robbed him? If we do, another and a worse one would spring up on the morrow. Might it not on the whole be as well to confine the party who has allowed himself to be deceived, upon the principle which obtains among some Oriental tribes, that the individual who permits himself to be so ingloriously swindled has not sufficient common sense to justify his remaining at large. *Caveat emptor* is a maxim of law founded on common sense and is a general answer to these grievances. He who needs a law to protect himself against his own acts needs also a guardian. We are not arguing in favor of the scoundrels who put up jobs on unsuspecting individuals, we only desire to impress the idea that if there were no gullible parties, the gulls would find their occupation gone.

TEA ADULTERATION.—Dr. J. M. Eder is the authority for the statement that one-half of all the tea sold is mixed with spent tea leaves. Processes for the sophistication of tea are considered valuable property, and if there has not been some misinformation sent abroad, the owner of a tea-doctering secret lately sought protection in its use from our courts. Among dealers of an article so generally used as tea there is a keen competition, and the temptation to have recourse to swindling as a fine art is strong and sometimes irresistible. By and by the evils will compel a remedy.

KEEPERS of gambling places, dance houses and Chinese opium dens at Modesto were ordered by the citizens to close up Thursday night and leave town within 24 hours.

Fresno County Mines.

[Written for the PRESS by J. W. A. WRIGHT.]

The mineral belts of the North Fork and Minaret districts in eastern Fresno, along the headwaters of San Joaquin river, well deserve the careful attention of the mining world by the number, extent, and good assays of their silver-bearing quartz ledges. Following the river's course, they are over 300 miles from San Francisco bay. A matter of interest in their consideration is the possibility that they are extensions of the already famous belt of Lake district, in Mono county, but a few miles distant across the Summit ridge of the Sierras. From the southeastern ends of the ledges of Minaret district, as far as they have been prospected, to the north face of Mineral hill, where the tunnels of Mammoth mine are located, is only about two miles in a direct line across the eastern spurs of Mammoth or Pumice mountain. The general bearing of North Fork and Minaret districts is from NW. to SE.; that of Mammoth ledge is S., 54° E. Hence the three belts form very nearly a continuous line from NW. to SE., not far from 15 miles long and about a mile wide, enclosed in granite walls to the east and west. Judging from the latest developments in these three interesting districts, and the adjoining Prescott and Laurel districts of Mono county, it is no doubt safe to say theirs is destined to become one of the most productive mining regions of either California or Nevada. This sketch will be devoted especially to Minaret and North Fork districts, the former named from the splendid sharp, numerous chimney-like peaks, called the Minarets, and located to the westward of it, across the deep gorge that here forms the narrow valley of the Upper San Joaquin; the other district being improperly named by its discoverer from the erroneous supposition that it was on the North Fork, some 10 miles farther west, when in reality it is on the east side of the main river.

As far as your correspondent could gather facts, with careful seeking, the first time a white man gave special attention to any of these ledges, was in the days of the "cement hunters," of which Mark Twain's inimitable pen gives some account. In the summer of 1865, an

Indian Chief, Shohoc,

A guide to one of the many parties that joined in the mad hunt for the noted "red cement," said to be more than half gold, led Mr. James F. Wilson to what is now the principal ledge of the Minaret district, believing that the sulphuret of iron, or "fool's gold," in it was the genuine article. Mr. Wilson thought little more of it till the new excitement from the discoveries in Lake district two years ago. He legally located this ledge, naming it Shohoc, in memory of his Indian friend, June 6th, 1878, by an odd coincidence the same date, as given your correspondent, when the Advance ledge was located in the so-called North Fork district, at a point three or four miles farther northwest. In the summer of '78, a number of other valuable ledges and extensions were located. But, strictly speaking, the first real location in this region was made in the summer of '77, northwest of the Advance ledge, by Harry Kirkwood, from the Borden country, who was then herding sheep in the present North Fork district. The following June he told his discovery to J. S. Lingo, a prospector of long experience, just returned from Little Cottonwood district, in Utah Territory. They set out for the district for further prospecting and locations, and arrived about the 25th of July, to find that T. G. Agnew, present recorder of the district, and W. H. Morris had previously arrived from the Bodie side, the former having located Advance ledge, June 6th; the latter, Sentinel mine, its southeast extension, July 10th, and Nevada, on a parallel ledge east, July 12th. Messrs. Lingo, Kirkwood, M. Baker and Juliue Hansen then located the Eureka, and J. B. Beasore soon became a partner. Up to the time of my visit, July 11th to 14th, the following ledges and extensions had been located in

The Minaret District,

All or most of them believed to be true fissure veins. By Mr. Wilson, in regular succession from west near the river to eastward up and over Summit ridge, at altitudes from 9,800 to 10,500 feet: Bona Fide, Joaquin Jim, Silver Cloud, Van Horn, Shohoc, Occidental, Twin Mounds, Blue Ledge, Lima and Sheba. At least six other allied ledges have been located; among them, Chieftain, Ruby and Silver, by H. N. Potts and S. P Hall; Baltimore and Belfast, by F. Sotcher; Savage, by Hall and Cernrike. Several claims were then being prospected by Mr. Elsey near Wilson's camp, but I did not learn their names. I have since been informed that ore from one of these new ledges has assayed over $300 per ton. On the high rocky ridges, on west side of main Joaquin, opposite Wilson's camp, the Exchange and other ledges have been prospected and located, appearing to be well charged with sulphurets of silver.

In case any of your readers hear of Wilson City, in "these diggings," please remember it is a name facetiously applied by the miners for purpose of locations to Wilson's camp, 9,800 feet up, near Bona Fide claim. This may prevent the disappointment expressed by two men who, after a long mountain tramp, packing their blankets, had been guided here by a finger board, in the meadow below, labeled Wilson City. On arrival at camp they saw only a tent, a brush screen and a camp fire in a little notch on a steep mountain side. They asked, "how far to Wilson City?" When told, "this is it;" they could only exclaim, with a blank look of astonishment and disgust, "Jerusalem!!" They were too full for further utterance, but not full enough to be happy.

The Nature of the Minaret Ores

Varies somewhat in the different ledges. No sulphurets of zinc or lead have yet been found. As I learn from Mr. Wilson, the Bona Fide ore contains black and gray sulphurets of silver and a fine light yellow sulphuret of iron yielding considerable gold. Joaquin Jim, named for the Piute chief who led the Indians in the Owens River war, is separated only by a 10-inch ledge of talcose slate, from the preceding ledge, and produces a similar ore. The next two are similar ore, very fine grained. The Shohoc ledge, which Mr. Wilson deems the principal one, and hence calls all his ledges the "Shohoc Con.," carries sulphurets of iron yielding silver and gold, the former largely predominating. Next two, somewhat like this; but the Blue ledge produces a dark gray ore, more porous and spongy than in other ledges. These veins vary in apparent width from 10 to over 100 feet. None have been prospected to a greater depth than ten feet, yet an assay in San Francisco, for proposed buyers, from mixed specimens of this surface ore, gave $145.32 silver per ton.

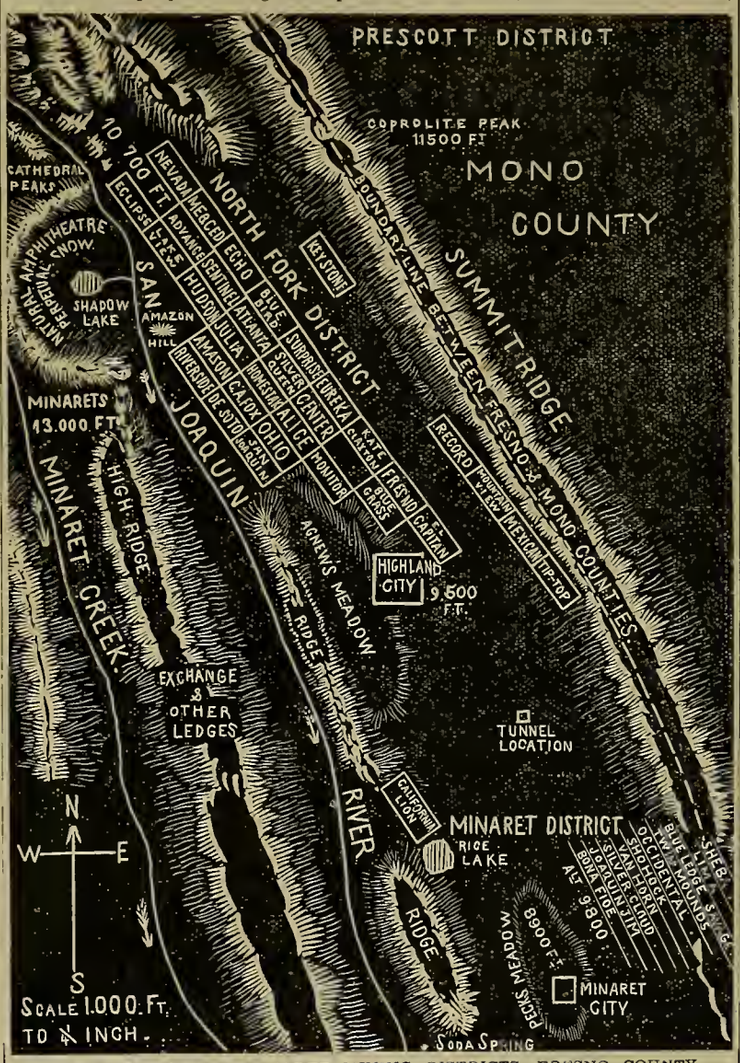
The following claims have been located in

The North Fork District,

Running from northwest to southeast. In the central ledge, Advance, Sentinel, Atlanta (also called Cosmopolite by counter claimants), Silver Queen, Center, No Name, Blue Grass. Next ledge east, Nevada (1,500 feet or more farther northwest than the Advance), Merced, Echo, Blue Bird, Surprise, Eureka, Kate Claxton, Fresno, El Capitan. Your readers will understand that all these claims embrace the usual 1,500 feet in length and 600 in width. Eastward there is space for two sets of claims, but little prospected as yet. Then east of this space, and immediately under the basaltic cliffs of Summit ridge, such as bound the upper edges of many ridges here, are five other claims on a ledge parallel to those above mentioned. The most northerly is the Keystone. Then comes the unclaimed space for three ledges. Then, in succession, the Record, Mountain View, Mexican and Tiptop. West of the central vein comes, first, the Eclipse claim, 1,500 feet farther north than the Advance, and its extensions, the Lakeview, Hudson, Julia, Homestake, Alice, Monitor. Farther west, beginning on a line with the Julia, comes the Amazon with its southeast extensions, the C. A. Fox and Ohio. Next, east and corresponding with these, are the Riverside, De Soto and San Joaquin. That these locations may be better understood, we should state that south of this mineral belt in a low land, separated from the San Joaquin by a ridge, is quite a body of valley land, moist and rank with luxuriant pasture plants, and known as Agnew's meadows. On the northeast edge of this well-fenced pasture, a site has been selected for the future town of this district, to be known as

Highland City.

Here, in a handsome grove of firs, which abound in this whole well-timbered region, the pioneer merchant of all that country, outside of Mammoth City, 10 miles southeast, is Mr. Smith Norris, formerly of Borden. His storehouse consists of logs built up in cabin form three or four feet and covered by a canvass tent, though he will build a good log store for the winter. His pack trains keep up supplies by regular trips to Borden, about 100 miles southwest. All success to Highland City, its merchant and his customers! The altitude of the town site is about 9,500 feet. The altitude of the upper point of Advance claim is 10,700. It is about two miles northwest of Highland City, and the Blue Grass, its most southern extension, reaches the city limits. El Capitan, the most southern extension of Nevada or Fresno ledge, is just north of Highland City. A mile or more south of this town site is California Lion ledge extending to Rice lake, also the Liberator and other ledges. Other prospecting and locations are going on northwest of this belt up to the very sources of the Joaquin, which are but four or five miles in direct line northwest of this district. The accompanying map indicates the various locations with general accuracy, though no regular surveys have yet been made.



NORTH FORK AND MINARET MINING DISTRICTS, FRESNO COUNTY.

Work on Shafts and Tunnels

Has progressed farther here than in the Minaret district, and results are highly encouraging.

The following shafts have been sunk: On Atlanta, 10 feet; Silver Queen, 14 feet; DeSoto, 10 feet. But most work has been done on the Eureka and Surprise. On both these, tunneling has begun, in addition to shafts sunk deep enough to prove the fine quality of the surface ore. A tunnel is commenced on the Eureka, 125 feet below the out-croppings, to reach the ledges in 260 feet. The altitude of its mouth is about 10,000 feet. They hope to finish it by October next.

In the Surprise, owned by J. T. Dodds and E. B. Lovelace—discoverer of the Enterprise mine near Fresno Flats—a tunnel in hard black slate, six feet high by four wide was finished 140 feet. With this they hope to reach the ledge early in August.

The Site of a 1,000-Foot Tunnel

Has been located by F. F. Letcher, formerly of Santa Cruz, at a point about a mile southwest of Highland City. It is intended to strike the extension of several ledges already named. One he expects to reach in 80 feet, and at least one more, possibly five more in the 1,000 feet. He has also filed on the new town site, and proposes a tunnel farther west, to pierce Amazon hill.

The Few Assays

Are very satisfactory for mere surface ores. The Eureka and Surprise ores are found to be good types of all the more easterly ledges in the slate belt. They show sulphurets of silver with some galena. The latter shows less and less as they go deeper. Only about half as much of it appears 15 feet down, as on the surface. In the Eureka, no zinc, arsenic, or antimony has yet been found, but some antimony appears in other veins. The Eureka ledge dips between 60° and 70° N E.

A dark ore of the Surprise has assayed $52 silver. Two other assays yielded $108 and $109, while a third in San Francisco gave $243 silver. Ore from the Homestake, owned by C. A. Fox, who, with Mr. Norris very kindly rode with me through the district, and found me opportunities for the information sought, has assayed $71 and $74. Cap ore from the Amazon, which is an immense ledge, averages $8 to $12. A striking mark of all the ledges in these new districts is their great width. The amount of ore in most of them is so great as to be almost incredible. Besides, mining districts could not possibly have better facilities for water, timber, tunneling, and drainage.

The Advance yields free milling ore, and is considered a fair type of the west lines of ledges, all but the DeSoto, a very peculiar looking ore, showing some antimony. Most of these ores contain iron sulphurets, but almost in the form of dust.

Having mentioned the abundance of timber in these districts—mostly firs and yellow pines—I must tell you of the uncommonly large California junipers—so like the red cedar of the East—growing near DeSoto ledge on a precipitous cliff, some 500 feet above the river bed. They are numerous, the largest measuring 22 feet in circumference near the ground. Its chief trunk is hardly 40 feet high. Its general appearance is wonderfully like representations of the celebrated "Cedars of Lebanon."

The Fall of Snow

There last winter, great as is the altitude, was not heavy, the ground being covered at no time to a greater depth than five feet. Some fell in September and October, but soon melted. The ground was covered from the latter part of January till the middle of May. Usually, in our wet winters there would, of course, be much more snow than last winter. Yet the temperature was so mild—though the last was one of our coldest winters—that it never interfered with work there, and men could go about comfortably without a coat during most of the daytime. These facts I learn from Mr. Dodds, who spent the whole winter there, and Mr. Fox who was with him most of the time.

The sketch would be incomplete if I failed to mention that in Peck's meadow, in the valley below Wilson's camp, a site has been chosen for the future Minaret City; altitude about 8,900 feet. Near it is a remarkably fine soda spring, the water of which seems also to be impregnated somewhat with iron. It, and a warm sulphur spring, temperature 100°, in Pott's meadow, about two miles farther down the river, will no doubt be useful medicinally in the future.

In closing this letter, I can merely allude in brief to the many grand views in and around these mining districts, and to their fine lakes and streams which they are very anxious to have the State Fish Commissioners stock with fish. Mr. Sotcher proposes to try some Mountain trout in a fine lake near the meadow, owned by him and Mr. Potts. Its temperature was 59° in July. The trout are caught in large quantities by Indians at a point below San Joaquin falls, about nine miles down the river from the meadow.

Shadow Lake and Surroundings.

Few more beautiful and grand mountain views can be found in California, than the great amphitheater and other charming features around Shadow lake. But space forbids any attempt at description farther than, that you see it best from the neighborhood of Coprolite, or Thumb peak, on a northern slope of the Summit ridge, or from the top of Advance ledge; also, that it is formed by what the miners call, the Minarets and Cathedral peaks, towering in a huge semi-circle 13,000 feet high in places, Shadow lake lying placidly between 3,000 and 4,000 feet beneath them, and 1,000 feet or more below your point of observation. The lake is surrounded by forests of fir, and vast masses of perpetual snow. The entire view there, or from the top of Summit ridge, is impressive and enchanting in the extreme. Mts. Lyell and Ritter are in full view.

An examination of these districts, the character and quantity of their ores, and the facilities for working them, convinces one that they need only a moderate amount of capital, and better means of transportation, to develop them to a condition that will pay well and permanently.

Fresno county, July 26th.

TERRIBLE storm on the Atlantic coast,

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The principal portion of the patent business of this coast has been done, and is still being done, through our agency. We are familiar with, and have full records, of all former cases, and can more correctly judge of the value and patentability of inventions discovered here than any other agents.

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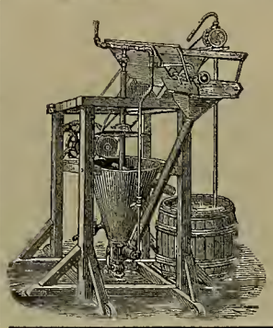

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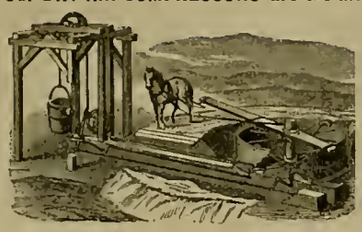

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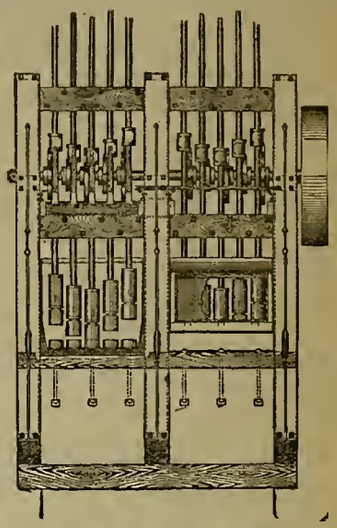

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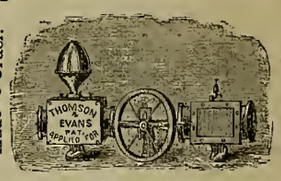

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Will find it to their advantage to call on us at 328 BUSH STREET, bet. Montgomery and Kearny, (up-stairs,) S. F

[CONTINUED FROM PAGE 117.]

per ton. The ores at the end of the drift are now assaying $700.

COLORADO.

ITEMS.—Denver *Tribune*, Aug. 13: The Bonanza tunnel in San Juan is in now over 700 ft, and will probably cut the large vein very soon at a depth of 650 ft below the surface. A new lead has lately been discovered at the Cerrillos, assaying, at a depth of 4 ft, 426 ounces. The carbonate belt on Eagle river has been found to be nine miles long on the north side of the river and six miles on the other. The heaviest body yet found is 13 ft thick, but as yet no deep holes have been sunk. At Rosita a few days ago Mr. Yeoman relocated an abandoned claim on Robinson hill, quite near town, and discovered a fine, but small, vein of mineral, which, at only three ft in depth, assayed 57 ounces in silver per ton. He calls it the Cow Boy. The Queen Victoria claim, owned by Messrs. Bassick, Smith, Davis and Steiger, on the north slope of Bassick hill, has a shaft of 100 ft deep. They have but very little mineral at the bottom of the shaft. Chellew & Co., lessees of the Kent County, have struck a feeder to the main vein, coming in from the southwest, on the hanging wall, in the intermediate or middle winze being struck below the 500 level. The crevice of smelting iron is quite wide and is very rich. The Red Cloud mine at Ouray has its shaft down 50 ft, showing a two-ft pay streak. At Silver Cliff a few days ago A. Marietta, who has been digging a hole in the Carbonate district north of the Baltic lode, and not far from the Rambler, struck a very good body of ore at the depth of 52 ft, which showed up by actual mill run 27 ounces of silver per ton. The North Star mine on King Solomon mountain is turning out more and richer ore than ever before. Already over 500 sacks of ore have been shipped to Lake City. A lot of 28 sacks taken from the third and lower level on the mine mill run at Lake City 634 ounces in silver to the ton. There are now en route to Lake over 80 sacks of this same class of ore. There are over 20 tons now on the dump, and the shipments have already amounted to 40 tons which have averaged over 250 ounces to the ton. The Clinton mine at Leadville has developed a 12-ft vein of ore. A sample of 400 pounds was brought to this city which gave a return of 110 ounces. Another lot from the same county, weight 80 pounds, was shown to contain 57 ounces of lead.

ITEMS.—Silver Cliff *Prospector*, Aug. 11: On one vein among the hills east of Silver Cliff, and north of Rosita, there are five mines—the Polonia, Twenty-six, Tecumseh, Ben Franklin and Dirigo. The first named of these is located on a hill about midway between the town of Rosita and Bassick's mine. The others, in the order named, follow the course of the vein, which, from the Polonia, bears west 20 degrees north. The Ben Franklin, owned by Messrs. W. Thurman and others, is one of the oldest mines in the district, and has four shafts, No. 2 of which is not used. No. 1 is connected by drift with No. 3, the present working shaft, now down 210 ft, and No. 4, to which a drift is being run at a depth of 50 ft. The pay streak of the Franklin averages about eight inches in width, its component parts consisting of galena, gray copper, zinc and pyrites of iron. The average of mill runs had by present owners is said to be 128 ounces silver, its assay value indicating a much higher average. In the Dirigo mine at a depth of 50 ft the distance between the walls slightly exceeds four ft. The crevice matter is a partially decomposed calcareous mass carrying silver, its assay value at present depth being about 16 ounces. The average width of the ore body proper approximates eight inches, its component parts being gray copper, galena, zinc, granulated iron and pyrites, its average value about 120 ounces, the range being from 40 up to 310 ounces per ton.

PERUVIAN.—Georgetown *Courier*, Aug. 14: This property is located in Peru district, near the head of Snake river. The ore vein is immense, being from two to four ft thick of solid galena, and, as the location is probably in the same belt as the Stevens mine, they can look for a grade that will average about the same as that mine. The property is opened by three shafts, and a crosscut tunnel has been driven 215 ft but has not yet intersected the lode.

IDAHO.

ITEMS.—*World*, Aug. 12: At Atlanta the Buffalo mine is looking better at present than it has for the last two years. They are taking out from seven to eight tons of ore per day. The rock is worth about $150 per ton. The Monarch mine is not looking very well now, but they expect to make a strike soon. The new shaft will be completed to the surface in about two weeks. The Last Chance made a run of about 200 tons, which paid well. Mr. J. N. Peddlar is working his mine, the Tahoma, and is taking out some good ore. He made a run of 75 tons this spring. About 50 tons of ore from Hawley & Co.'s mine, on Shaw's mountain, crushed in Plowman's mill, yielded about $40 per ton.

YANKEE FORK.—*World*, Aug. 15: A depth of 50 ft has been attained on the Montana mine, which is steadily improving in width and richness with depth. The ore body is from six to eight ft wide and very rich.

MONTANA.

ITEMS.—Butte *Miner*, Aug. 12: The station chamber on the 500 level of the Alice is in 33 ft from the shaft and is being driven ahead. The station which is being driven directly towards the ledge will be 13 ft longer than its present length. From its face a smaller tunnel will be run to tap the lode. Upon completion of the station the work of advancing towards the lode will be arrested until the pump will have been set up and tested, when the task of cutting through the water-tight footwall casing will be undertaken. The lode is estimated to be between 100 and 110 ft from the shaft on the 500 level; but owing to the decreasing hardness of the rock as the footwall is approached the work of driving to it will be much more than half done when the northern face of the station is reached. The Grove Gulch mill was shut down the other day, to remain closed indefinitely, and the hands paid off. This mill has been employed upon ore from the Olive Branch, which, although very rich, has become too base for reduction by the free-milling process. A lot of Olive Branch ore sampled lately is reported as averaging 400 ounces per ton, but very base, so base that it must be smelted.

OREGON.

VIRTUE MINE.—Baker City *Democrat*, Aug. 13: Work has been commenced at the Virtue mine. The pumps are at work drawing the water from the shafts, and as soon as this is accomplished a full set of hands will be put into the mine and ore taken out to keep the mill constantly running.

UTAH.

THOMPSON & MCNALLY MINE.—Silver Reef *Miner*, Aug. 13: This property is situated on the White Reef and bounded on the north by the Leeds company's claim known as the Maynard, on the south by the McKelvey, and on the east by the Stormont. The tunnel is in 150 ft. The width of ore measures six ft between foot and hanging wall, three ft of which is impregnated with horn silver and black sulphurets, and assays from $200 to $1,500 per ton in silver, some going even as high as $6,000 per ton. There is exposed in the drift on the south side, where the tunnel will penetrate the west side of the reef, a body of ore for a distance of 130 ft, ready to take out as soon as the tunnel is through. There are also about 500 tons piled on the different dumps, which will average between $30 and $35 per ton.

NOVEL USE OF ETHER.—A prisoner, named Uhlmann, recently barricaded himself in his cell at Vevey, Switzerland, and defied the gendarmes to take him before the judges. It was not thought advisable to shoot him, and the court would not wait till he was starved into surrender, so ether was thrown into the cell until he became sufficiently stupefied to be harmless.

An Infamous Business.

May the curse of God rest upon an impious traffic which is robbing our State of its manhood; turning the feet of our sons away from the paths of industry, and transforming our sober and industrious fathers into condemned criminals. It certainly would seem that enough of disgrace and destruction has already been visited upon our homes to warn all those who have anything of self-esteem and family love remaining, to shun an indulgence which saps their strength, distracts their minds, casts to the winds the fruits of a life-time's labors, and leads them to deeds which bend their heads with shame and plunge their families into the depths of despair. But the end is not yet. Infatuation still leads men to pursue gain, even where loss and ruin are surest to be found, and the community, while it pours out its sympathy for the fallen, still accords respectability to a traffic which should be held in the deepest detestation for the evil which it brings upon society.

Instances recur which are so like hundreds which have gone before that the details need hardly be recited. A man, with a beautiful home, a devoted wife and a group of lovely children; a man who, by nearly 20 years of constant devotion to the interests of his employers, had won their fullest confidence, and who stood before the community as a model of unyielding industry, suddenly appears a confessed criminal, and in a day is transformed from an apparent promoter of public virtue to an enemy of society, who has his liberty only at the price of pledges from his friends. Does anyone need to be told the cause of the transformation? Is it necessary to tell again how the glittering snares of the stock gambler entrapped the feet which trod so firmly the path of virtue and industry; how the mind was turned from its sober thoughts and honorable ambitions by the visons of short-cuts to fortunes; how the blinding promises were false as perdition, and yet so alluring that he who pursued them was led in ths deeper, until the funds of employers, confidently entrusted to his cars, were secretly appropriated to feed the unholy fire of the gambling passion; how ths theft was ere long discovered, and how ths bars closed in the wreck of reputation and of honor, while tears flow in ths home and heartfelt sympathy and regret fill a neighborhood.

But what use is it to recite such painful incidents when ths evil seems to grow the while? No sooner does some wretched conspiracy of impious men fall into the hands of the police than another, even more glaring, springs into view. And ths peopls—poor, senseless throng—crowd the counters of the swindling cormorants giving their hard-earned savings in return for naught but worthless promises. For a few days the gold pours in, and then ths throng comes some morning to find the doors closed and their treasures gone beyond recovery. One would think that these specious frauds would be recognized by the shallowest brain, and yet experience proves that victims are always ready to jostle one another in the rush to ruin. It is plain that there should be some power to guard the people against these coarser forms of fraud, for these are the traps that catch the poor and the unwary. There is one thing that the public should demand from the press, and that is, that the insidious snares should not be spared in the public prints. What use is it that the editorial columns of our dailies warn people against them so long as their glittering advertisements are received by the publishers? What use to preach virtue when the hands are filled with the rewards from vice? The press is a sharer in the fortunes made by ruining homes and wrecking lives, and so long as this is true, the friends of humanity will have cause to mourn.

The public has its eye open to the evil, and yet it lives. In the city, some business houses which employ many men have their spies abroad and as soon as any man in their employ takes a hand in stocks, he is watched and his accounts scrutinized daily. What better evidence could he had of the way in which the business is regarded by our leading men? And yet the evil grows. Not satisfied with the gambling in railway and other securities at the East, they have introduced the California system, and already victims are falling just as men fall when plague settles down upon a city. Only last week it was a bank officer who went down to perdition in New York, by breach of trust, through gambling in stocks. Thus, east and west, the evil spreads, and distrust rises as virtue sinks. What can save the people? Nothing, unless each one works to save himself, and to spread a truer idea of the danger. Let it be understood that whoever enters the business in any form places his foot upon dangerous ground, which may ere long part and engulf him. As a man values his reputation; as he loves his home, his wife, his children; as he values a right life here and cherishes a hope beyond, let him shun the evil—the crowning evil of the day.—*Pacific Rural Press.*

THE Bishop of Belgium excommunicates all teachers in schools established by the State under the education law.

IT is estimated that the log crop of Wisconsin this year will reach 1,635,000,000 feet, against 1,075,000,000 last year.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS TO DEWEY & CO.'S MINING AND SCIENTIFIC PRESS PATENT AGENCY.]

FOR THE WEEK ENDING AUGUST 12TH, 1879.

218,420—BED CLOTHING—O. S. Baker, S. F.
218,472—OVERALLS—P. Banner, S. F.
218,489—MUFFLE FURNACE—James R. Clark, S. F.
218,514—STEAM PUMP—John Gates, Portland, Ogn.
218,446—FEED-WATER HEATER AND CONDENSER FOR STEAM BOILERS—R. Llewellyn, S. F.
7,584—SARSAPARILLA OR BLOOD PURIFIER—Trademark—Geo. L. Carroll, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

OVERALLS.—Pincus Banner, S. F. Dated Aug. 12th. This invention relates to certain improvements in overalls; and it consists of a peculiar re-enforce for the seat, which is formed with three extensions or projections, two of which extend down the inside leg-seams, while the third extends over the middle seam up to the front opening of the pants. The corner of the pocket openings are prevented from being torn out by a peculiar system of cross-stitching, so that all supplemental re-enforcing pieces at these points may be dispensed with.

MUFFLE FURNACE.—James R. Clark, S. F. Dated Aug. 12th. The invention consists in providing a series of muffles communicating with each other, the fire passing between the hearth of one and the arch of the other on its way to the stack, so that although ths ore is roasted it is nowhere in the presence of the flames; it further consists in connecting with the furnace a series of tubs or vats for holding ors, into which chlorine, generated in the furnace while the ore is roasting, is led. These tubs or vats are provided with pumps for circulating the liquor and passing it through and through the ore as fresh chlorine is continuously added from the furnace.

Machinery at the Mechanics' Fair.

While examining the different exhibits spread out in ths most attractive manner at the pavilion, there are certain ones which attract differently disposed people. The ponderous, noisy mining machinery, and the rattling of ths agricultural implements, possesses a charm for many, while others prefer the quest of the more innocent looking exhibits. The machinery is all placed on the right of the pavilion as you come in through the Mission-street entrance. Here are found the iron-lathe machines, engines, pumps, ore-crushers, amalgamators, blowers, type-foundry, threshers, reapers and mowers, corn shellers, and every variety of curious and heavy machinery, in full operation. In the midst stands the large Corliss engine, which furnishes power for the whole, and the Brush electro-dynamic generator, which assists in throwing light upon the subject. The displays of saws of every variety and form, and for every use, and the bright brass foundry work, are to the minds of many as beautiful an exhibit as is that of fine arts in the gallery. Many visitors watch the moving machinery as if fascinated. The smaller and more modest displays are pleasant to look at, but the almost human intelligence exhibited in the workings of heavy and unwieldy metal is more satisfying to the imagination. The results of machinery, as seen in the iron and steel manufactures worked into shape as if of some plastic material, produces a feeling of content, and every visitor, long after the visit, retains a general impression of the various details, and convince him that he has learned something about the capacities of this coast.

The Continental Oil Company.

The Continental Oil Company of this city (F. B. Taylor & Co.), importers of and dealers in illuminating and lubricating oils, have extensive warehouses on Fifth, Berry, and Channel street, where their oil is received in their own patent compartment cars, and from this point is distributed in bulk or packed in their oil-canning establishment. Messrs. Taylor & Co., being agents for the leading manufacturers in their line at the East, have unequaled facilities, and receiving their goods direct, profits to middle men are avoided. The oils imported by rail are necessarily fresh, being direct from the refinery. They keep on hand the Eureka, Alladin, Luster, Golden Star, Downer's, Taylor's, Excelsior, Continental Water White, and other high test oils. They deal also in naptha, benzine, gasoline, crude petroleum, lucine fluid, white lead, turpentine, Sapolio, axle grease, Cologne spirits, alcohol, etc., all of the best brands in market. A full assortment of paints, paint oils, colors, zincs, varnishes, crack colors, brushes, etc., etc., is kept. The offices and store are at 120 and 122 Front street. Messrs. F. B. Taylor & Co. have been in the business for many years, and are well known as keeping a very large stock at reasonable prices.

News in Brief.

CHOLERA is still prevalent at Cahul.

GEORGIA Mormons are emigrating to Utah.

PIANOS are being shipped from New York to Japan.

THE anti-tax disturbances in India are becoming serious.

THE Victoria Chamber of Commerce has been dissolved.

RAIN fell August 18th in London for 12 hours continuously.

THE National Board of Health met at Cairo, Ill., August 18th.

SINCE 1859 the Colorado mines have yielded $82,000,000.

THE ZULUS generally acquiesce in the deposition of Cetewayo.

MISSOURI is taking vigorous steps to secure foreign immigration.

AT Havana, Cuba, last week, 100 deaths occurred from yellow fever.

LOCUST GROVE HOTEL, of Bath, L. I., was burned August 18th.

THE Indian corn crop in Bulgaria is almost a total failure from drouth.

A GREAT Socialist demonstration took place Monday at Dresden.

THE Arctic exploring yacht *Jeannette* arrived at Ounalaska August 2d.

A DISASTROUS waterspout occurred on the 15th at Pays de Gex, Switzerland.

FOUR persons killed and 30 injured by a railway accident in France.

AN International Convention of Jews will be held in Paris in September.

SCHUYLER COLFAX is to reappear as a lecturer during the coming season.

THE loss by the Tremont Temple fire in Boston will not exceed $105,000.

THE Porte has appointed Plenipotentiaries to arrange the Greek frontier.

THE firman of investiture of Tewfik Pasha was received at Cairo. August 18th.

SPECIE in the Imperial Bank of Germany decreased 539,000 marks the past week.

THE drouth in Cashmere continues, and the condition of the people is deplorable.

Two streams of lava flowed from Mt. Vesuvius recently as far as the base of the cone.

A RIOT occurred at Quebec August 18th, in which a great number of persons were injured.

NELLIE GRANT SARTORIS is not dead, but Mrs. E. Sartoris (formerly Adelaide Kimball) is.

THE imports of specie at New York last week amounted to $1,073,416—$963,587 being in gold.

THE Cashier of the Citizens' National Bank at Washington is a defaulter in the sum of $60,000.

MEMBERS of the British Parliament are about to visit America to take cognizance of the present harvest.

BULLION withdrawn from the Bank of England August 18th, £30,000, which was shipped to Canada.

ANOTHER death from yellow fever occurred August 18th at the New York quarantine hospital.

THE Napoleonic fete of the 15th of August was omitted in Paris this year, the first time in 30 years.

COLLECTOR BALL has been elected Mayor of Sitka, a civil government having been fully organized.

MISSISSIPPI planters fear a great increase in the exodus of laborers after the cotton crop is gathered.

PARIS has 65,000 houses, London 460,000 more than than Paris, Berlin and New York combined.

A MAN was arrested near Erie, Pa., the other day charged with a murder committed in Philadelphia in 1865.

HUNGARY produces more horses than any other country of its size—2,158,000 for a population of 15,000,000.

IN Illinois this year 42,041,252 bushels of wheat will be harvested—the largest crop ever raised in that State.

IT is stated at Madrid that the marriage of King Alfonso and Archduchess Maria will take place at the end of October.

A GENTLEMAN, representing 250 Scots, has gone into the Yellowstone country to find an American home for them.

RYE, the principal bread material of Germany, will only yield half a crop this year, while wheat will yield a full harvest.

AT Liverpool August 18th wheat was quoted at 8s 6d@9s 6d for average California white, and 9s 5d@9s 10d for club.

A PRIVATE gentleman at Moscow, Russia, has been sentenced to 12 years in the mines for attacking and insulting a sentinel.

THE great map of the moon upon which Dr. Julius Schmidt, of Athens, has been at work since 1867, shows 32,856 craters and ring-like formations on the lunar surface; and 348 rills and clefts. The number of craters would be increased to 100,000, according to Schmidt's estimate, in a complete chart representing the moon as it appeared when seen with a magnifying power of six hundred.

Fine Arts at the State Fair

The citizens of Sacramento are arranging to have an art exhibition during the coming State fair at that place. A large sum of money will be expended in its formation, and the gentlemen who compose the committee are a sufficient guarantee that business is meant. W. H. Mills, B. D. Kennedy, S. C. Densen, H. H. Pierson, George H. Redding and Norton Bush, form the executive committee, with Wm. P. Coleman of the State Board of Agriculture. A new art gallery connected with the pavilion at Sacramento will be erected, and no means left untried to make a success. Tho C. P. R. R. will forward all articles for exhibition free of charge.

Communications should be addressed to I. N. Hoag, Secretary of State Agricultural Society, Sacramento, and will receive prompt attention. The State fair opens on the 8th of September, and closes on the 13th, so that applications for space should be made at once.

We learn from the *Record-Union* that the art gallery being constructed on the balcony on the west side of the pavilion is almost completed. There will be 160 feet of wall space added to the space heretofore devoted to the display of pictures. Mr. Norton Bush, who has charge of the business on behalf of the committee, visited San Francisco and received positive assurances from Bradford, Perry, Brooks, Tavernier, Keith, Rix, Deakin, Tojetti, Strauss, Denny, Hahn, Williams and others that they will exhibit. Thomas Hill was out of the city, but arrangements will be made to have some of his work on exhibition. Of these, Bradford, Brooks, Tavernier, Keith, Rix, Tojetti, Stranss, and Williams never before exhibited at the fair. The exhibition of the coming State fair will far surpass any of its predecessors. The very best works of the artists named will be on exhibition.

OUR AGENTS.

Our Friends can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send done but worthy men.

J. L. Tharp—San Francisco.
R. W. Crowell—California.
A. C. Knox—Pacific Coast.
S. V. Blakeslee—State of Nevada.
G. W. McGrew.—Santa Clara county.
Milton Kennedy.—Kern and Inyo counties.
J. B. Bachelder.—Shasta County, Cal.
H. H. Meseenger—Arizona.

Back Numbers Wanted.

The following volumes and single copies of the Mining and Scientific Press are wanted at this office, for which a reasonable price is offered:

Year.	Volume.	
1870	20	2 Complete volumes, 1st half (of year).
1870	20	2 Copies of No. 2, Jan. 1st.
1870	20	1 Copy each of No. 1, Jan 1st, 3 of Jan. 14th, 7 Feb. 11th, 6 Feb. 4th.
1870	21	1 Copy of No. 7, August 13th.
1871	22	5 Copies of No. 1, Jan. 7th.
1871	22	3 Copies of No. 5, Feb. 4th.
1871	22	1 Copy of No 3, Jan. 21st, 6 of Feb. 2d, and 1 of May 1st.
1871	23	1 Copy of No. 2, July 15th, and 9 Sept. 2d.
1872	24	2 Copies of No. 4, Jan. 27th.
1872	24	3 Copies of No. 7, Feb. 17th.
1872	24	2 Copies of No. 17, April 27th.
1872	25	1 Copy of No. 10.
1872	25	1 Complete volume, last half (of year).
1873	20	3 Copies of No. 8, Feb. 22d.
1873	26	3 Copies of No. 9, March 1st.
1873	26	2 Copies of No. 10, March 8th.
1873	20	1 Copy of No. 7, Feb. 15th.
1873	27	3 Copies of No. 20, Nov. 15th.
1873	27	4 Copies of No. 21, Nov. 22d.
1873	27	3 Copies of No. 24, Dec. 13th.
1875	30	1 Copy of No. 4, Jan. 23rd.
1875	30	1 Copy of No. 5, Jan. 30th.
1875	30	1 Copy of No. 8, Feb. 20th.

Every new subscriber who does not receive the paper, and every old subscriber not credited on the label, within two weeks after paying for this paper, should write personally to the publishers without delay, to secure proper credit. This is necessary to protect ourselves and subscribers against the acts and mistakes of others.

Fresh attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

How to Stop the Paper.—It is not a herculean task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

Sample Copies.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

Extra Copies can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

Experimental Machinery, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. See ad. F. W. Fuller, 415 Market St., second floor, S. F.

Chew Jackson's Best Sweet Navy Tobacco

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by Sutro & Co.]

San Francisco, August 20, 3 P. M.

Silver, 25.
Gold Bars, 890@910. Silver Bars, 6@16 ⅌ cent. discount.
Exchange on New York, 20, on London bankers, 49½@49¾. Commercial, 50; Paris, five francs ⅌ dollar; Mexican dollars, 90½@92½.
London Consols, 97⅞; Bonds (4%), 105¼.
Quicksilver in S. F., by the flask, ⅌ lb, 33½c.

GENERAL MERCHANDISE.

[WHOLESALE.]

Wednesday M., August 20, 1879.

CANDLES.

Crystal Wax	17 @—
Eagle	12 @—
Patent Sperm	30@—

CANNED GOODS.

Assorted Pie Fruits, 2½ lb cans	2 25 @ —
Table do	3 50 @ —
Jams and Jellies	3 75 @ —
Pickles, hf gal	3 25 @ —
Sardines, qr box	1 67½@1 90
Hf Boxes	2 50 @2 75
Merry, Faull & Co's. Preserved Beef, 2 lb. doz	3 75 @4 00
do Beef, 4 lb. doz	6 50 @ —
Preserved Mutton, 2 lb. doz	3 75 @ —
Beef Tongue	6 50 @ —
Preserved Ham, 2 lb. doz	6 50 @ —
Deviled Ham, 1 lb. doz	5 50 @ —
do Ham, ½lb doz	3 00 @ —
Boneless Pigs Feet, 3 lbs	4 50 @ —
2 lbs	3 75 @ —
Spiced Fillets, 2 lbs	4 25 @ —
Head Cheese, 3 lbs	4 25 @ —

COAL—Jobbing.

Australian, ton	5 00 @ 6 50
Coos Bay	— @ 5 50
Bellingham Bay	— @— —
Seattle	5 50 @ 6 00
Cumberland	12 00 @15 00
Mt Diablo	4 75 @ 6 00
Lehigh	11 50 @12 50
Liverpool	6 00 @ 6 50
West Hartley	— @ 8 00
Scotch	— @ 8 00
Scranton	@— —
Vancouver Id	5 00 @— —
Charcoal, sack	75 @— —
Coke, bush	60 @— —

COFFEE.

Sandwich Id, lb	— @— —
Costa Rica	15 @ 16½
Guatemala	15 @ 16½
Java	25 @— 28
Manila	17 @— —
Ground, in cs	25 @— —

FISH.

Sac'to Dry Cod	— @ 4
do in cases	5 @ 5
Eastern Cod	— 7 @— 7½
Salmon, bbls	8 00 @ 9 00
Hf bbls	5 00 @ 5 50
1 lb cans	1 10 @ 1 12½
Pkld Cod, bbls	22 00 @— —
Hf bbls	11 00 @— —
Mackerel, No. 1, Hf Bbls	9 50 @10 00
In Kits	1 85 @ 2 10
Ex Mess	3 25 @— —
Pkld Herring, bx	3 00 @ 3 50
Boston Smkd H'g	70 @— —

LIME, Etc.

Plaster, Golden Gate Mills	3 00 @ 3 25
Land Plaster, in 10 00	@12 50
Lime, Sta Cruz, bbl	1 25 @ 1 50
Cement, Rosendale	2 00 @ 2 25
Portland	4 00 @ 4 50

NAILS.

Ass'ted sizes, keg	2 70 @ 2 75

OILS.

Pacific Glue Co's Neatsfoot, No 1	1 00 @ 90
Castor, No 1	1 35 @ —
do, No. 2	1 30 @ —
Baker's A A	1 25 @1 30
Olive, Magniol	5 25 @6 75
Possel	4 75 @5 25
Palm, lb	9 @ —
Linseed, Raw, bbl	78 @ —
Boiled	80 @ —
Cocoanut	55 @ —
China nut, cs	— @ 65
Sperm	1 40 @ —
Coast Whales	— @ 32½
Polar	— @ 35
Lard	— @ 70
Oleophine	22 @ 22
Devoe's Brilt	17½@ 18½
Photolito	— @ —
Nonpariel	31 @ 32½
Eureka	18 @ 42½
Barrel kerosene	20 @ —
Downer Ker	35 @ —
Elaine	37½@ —

PAINTS.

Pure White Lead	8 @ 8½
Whiting	1½@ —
Putty	4 @ 6
Chalk	1½@ —
Paris White	2½@ —
Ochre	3½@ —
Venetian Red	3½@ —
Averill Mixed Paint, gal. White & tints	2 00 @2 40
Green, Blue & Ch Yellow	3 00 @3 50
Light Red	3 00 @3 50
Metallic Roof	1 30 @1 60

RICE.

China, Mixed, lb	4¾@ 5
Hawaiian	5 @ —

SALT.

Cal. Bay, ton	15 00 @22 50
Common	10 00 @12 00
Carmen Id	12 00 @14 00
Liverpool fine	19 00 @— —

SOAP.

Castile, lb	8 @ 15
Common brands	4½@ 6
Fancy brands	7 @ 8

SPICES.

Cloves, lb	— @ 45
Cassia	19 @ 20
Nutmegs	85 @ 87½
Pepper Grain	— @ 12
Pimento	19 @ 20
Mustard, Cal, ½ lb glass	— @1 25

SUGAR, ETC.

Cal. Cube, lb	— @ 10½
Powdered	— @ 10¾
Fine crushed	— @ 10½
Granulated	— @ 10
Golden C	— @ 8½
Cal. Syrup, kgs	70 @ —
Hawaiian Moi'sses	25 @ 30

TEA.

Young Hyson, Moyune, etc	— @ 51
Country pckd Gunpowder & Imperial	— @ 42½
Hyson	30 @ 35
Fooo-Chow O	35 @ —
Japan, 1st quality	40 @ —
2d quality	20 @ 25

METALS.

[WHOLESALE.]

Wednesday M., August 20, 1879.

IRON.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @25 00
American White Pig, ton	23 00 @— —
Oregon Pig, ton	25 50 @— —
Refined Bar	2¾@ 3½
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 7
Norway, according to thickness	5½@ 7
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	15 @ 17
Black Diamond, ordinary sizes	15 @— —
Drill	16 @ 17
Flat Bar	15 @ 19
Plow Steel	8 @
TIN PLATES.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb, less than cask	9½@— 10
NAILS.—	
Assorted sizes	2 90@3 00

LUMBER.

Wednesday M., August 20, 1879.

CARGO PRICES OF REDWOOD.

Rough, M	13 00
Refuse	9 00
Clear	23 00
Clear Refuse	13 00
Rustic	23 50
Refuse	18 00
Surfaced	20 00
Refuse	14 00
Flooring	20 00
Refuse	12 00
Beaded Flooring	23 00
Refuse	13 00
Half-inch Siding	16 00
Refuse	14 00
Half-inch Surfaced	20 00
Refuse	14 00
Half-inch Battens	15 00
Pickets, Rough	11 00
Rough, Pointed	12 50
Fancy, Pointed	18 00
Shingles	1 75

PUGET SOUND PINE

RETAIL PRICE.

Rough, M	18 00
Fencing	18 00
Flooring and Step	38 00
Narrow	30 00
2d quality	25 00
Laths	3 50
Furring, lineal ft	

REDWOOD.

RETAIL PRICE.

Rough, M	18 00
Refuse	14 00
Pickets, Rough	15 00
Pointed	15 00
Fancy	22 50
Siding	20 50
Surfaced & Long Beaded	30 00
Flooring	30 00
Refuse	22 50
Half-inch Surfaced	30 00
Rustic, No. 1	30 00
Battens, lineal ft	
Shingles M	2 00

Signal Service Meteorological Report.

San Francisco.—Week ending August 19, 1879.

	Aug. 13	Aug. 14	Aug. 15	Aug. 16	Aug. 17	Aug. 18	Aug. 19
Highest and lowest barometer	29.885	29.015	29.939	29.911	29.803	29.804	29.926
	29.835	29.876	29.888	29.815	29.720	29.735	29.823
Maximum and minimum thermometer	61	63	63	61	62	64	61
	53	51	50	53	53	52.5	54
Mean daily humidity	83.7	85.7	85.7	85.7	84	82.3	81.7
Prevailing wind	SW	W	W	W	W	W	SW
Wind—miles traveled	290	200	259	273	326	278	245
State of weather	Foggy	Fair.	Fair.	Fair.	Cloudy	Cloudy	Fair.

Rainfall in twenty-four hours.

Total rain during the season, from July 1, 1879. 0.01 in

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Gover Mining and Milling Company.—Principal place of business, San Francisco, California. Location of works, Amador county, near Drytown, California. Notice is hereby given that at a meeting of the Board of Trustees, held on Wednesday, the 6th day of August, 1879, an assessment (No. 39) of Fifty Cents per share was levied on the capital stock of the corporation, payable immediately, in gold coin or legal currency of the United States, to the Secretary, at the office of the company, Room 8, No. 402 Front street, San Francisco, California.

Any stock upon which said assessment shall remain unpaid on Tuesday, the 9th day of September, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 6th day of October, 1879, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Trustees.

W. O. WILSON, Secretary.

Office, Room 8, No. 402 Front street, San Francisco, Ca

Annual Meeting—Office of the Mono & Cross Consolidated Mining Co., San Francisco, Cal., August 8th, 1879. The Annual Meeting of the Stockholders of the Mono & Cross Consolidated Mining Company, for the election of a Board of Trustees for the ensuing year, and for the transaction of such other business as may properly come before it, will be held at their office, Rooms 3 and 4, No. 309 California street, San Francisco, California, on Monday, August 25th, 1879, at two o'clock, P. M., of that day. Transfer books will be closed on Thursday, August 14th, 1879, at three o'clock, P. M.

J. M. BUFFINGTON, Secretary.

Annual Meeting—Safety Powder Co. Notice is hereby given of the annual meeting of the stockholders of the Safety Powder Co., at their office, corner Octavia and Greenwich streets, on Saturday, the 30th day of August, 1879, at the hour of three o'clock, P. M. By order of the President.

S. O. GREGORY, Secretary.

Amusements.

CALIFORNIA THEATER.

Barton & Lawlor.....Manager.
Barton Hill.....Acting Manager.

ROBSON & CRANE.

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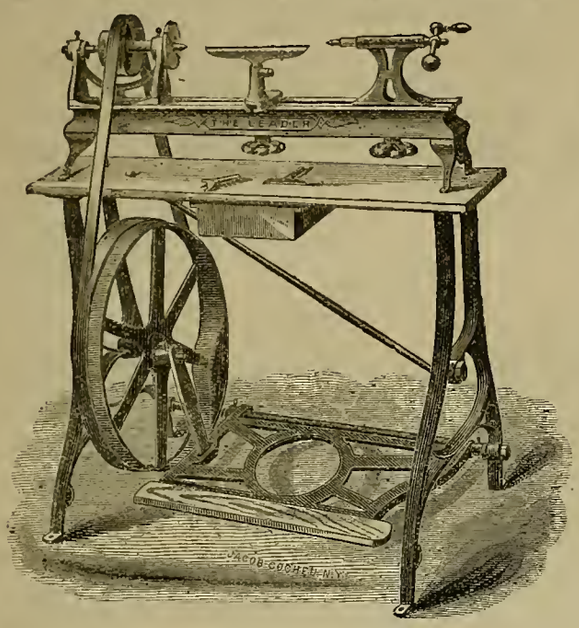

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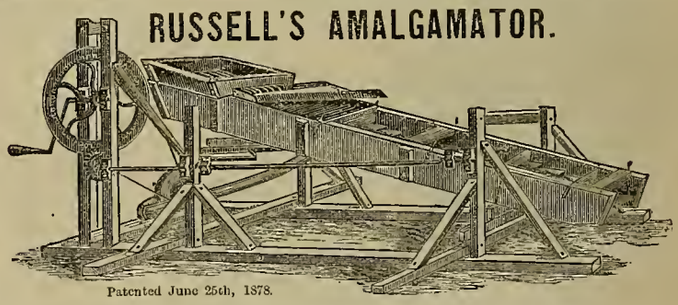

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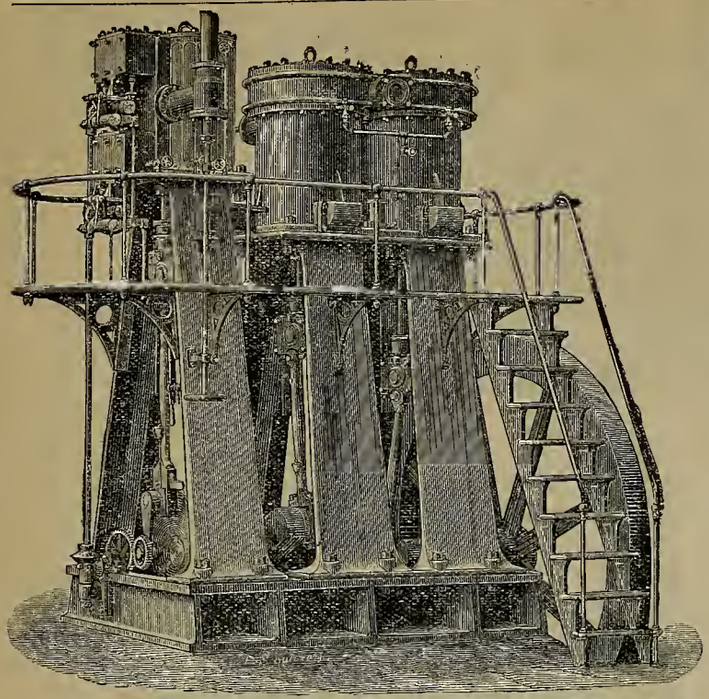

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This House is especially designed as a comfortable home for gentlemen and ladies visiting the city from the interior. No dark rooms. Gas and running water in each room. The floors are covered with body Brussels carpet, and all of the furniture is made of solid black walnut. Each bed has a spring mattress, with an additional hair top mattress, making them the most luxurious and healthy beds in the world. Ladies wishing to cook for themselves or families, are allowed the free use of a large public kitchen and dining room, with dishes. Servants wash the dishes and keep up a constant fire from 6 A. M. to 7 P. M. Hot and cold baths, a large parlor and reading room, containing a Grand Piano—all free to guests. Price single rooms per night, 50 cts.; per week, from $2.50 upwards

R. HUGHES, Proprietor.

At Market Street Ferry, take Omnibus line of street cars to corner Third and Howard.

PACIFIC POWER CO.

Room with steam power to let in the Pacific Power Co.'s new brick building, Stevenson street, near Market. Elevator in building. Apply at the Company's office, 314 California street.

CAUTION—To Section Chimney Builders.

All chimneys on which joint bands with cement, or its equivalent, are used to make the joint smoke and fire-proof, with rods, clamps, or their substitutes, to brace the chimneys to the buildings, are INFRINGEMENTS on my patents. My patents for sectional chimneys have been sustained in every instance.

J. BROWELL, Pioneer Chimney Builder,

442 Jackson St., S. F., and 1200 Broadway, Oakland

C. C. Bitner's Apparatus for Obtaining Metallic Copper from its Solutions.

Patented March 18th, 1879. Will precipitate with steam in three hours, requiring no machinery to run it. Cost of constructing apparatus, $75. The old cylinder process takes four hours to precipitate and costs from $1,200 to $1,500 to construct, besides the machinery to run it. For right to use my Precipitator address O. C. BITNER, Spenceville, Nevada County, California.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

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The Prospector and His Rewards.

Every now and then there comes to us an enthusiastic prospector bringing what he believes to be samples of some mineral found by him in the course of his peregrinations over the country. Sometimes these samples prove to be what they are taken for and sometimes not. Sometimes they are the genuine article, but so debased through combination with other troublesome or worthless substances as to render them of no account. Again, the samples brought in may be genuine and pure enough and the mineral may exist at the place where found under highly favorable conditions in all save its remoteness or inaccessibility from points where it can be marketed or utilized. Between these several causes tending to deprive such discoveries of commercial value, there results to this worthy class of persons much disappointment.

The prospector before setting out has as a general thing some idea, but not a very definite one, as to how this, that or the other mineral ought to look, and noticing in his wanderings something that resembles it, he makes a halt and forthwith proceeds to make a more close examination. If, after taxing the scanty resources of his mineralogical lore and venturing a few intelligent guesses he is favorably impressed with the appearance of the thing, he selects the best looking pieces, and wrapping them carefully in such bits of rags or remnants of the MINING AND SCIENTIFIC PRESS as he may happen to have about him, loads his jack or other agent of transportation and proceeds on his journey unless, to be sure, elated by the presumed importance of the discovery, he turns his footsteps directly homeward.

Arrived in San Francisco he is not long in seeking our sanctum and making known his good luck, removing, meantime, from a well worn sack bits of rock, mineral, petrifactions, and what not, picked up in some distant range of mountains or on the far-off desert. He has discovered this, that and the other mineral or metal exhibiting these specimens in evidence of the find. He has come across an ore-bearing vein of gold, silver, copper, etc., the like of which was never before seen, or it may be a mountain of coal, sulphur or salt—a mineral spring of marvelous medicinal virtues—an irrepressible oil well—a soap mine, possessed of fearfully detergent properties—slabs of mica, fit for building a crystal palace—bundles of asbestos, the probable remains of an ancient Phœnix—bricks of Kaolin already molded and laid up in a huge kiln resembling the Tower of Babel, ready for burning—with more alike useful and wonderful. If our prospector be of a scientific turn of mind, he may have to tell us of the discovery of a live glacier, resting in some lofty cradle of the Sierra, and extinct volcano standing off in some out-of-the-way place—a strange petrifaction, likely a Digger Indian or a rattlesnake of the pliocene age, or other thing of especial interest to the curiosity hunter or the savant.

They are generally honest and very often highly intelligent, these professional prospectors, and despite their over-sanguine temperament and many mistakes, must be accounted a very useful class of citizens, the world being indebted to them for many of the most important mineral discoveries ever made. Like the frontiersman, the mountaineer and the trapper, they are the out-growth of circumstances—a necessity of the age; and being so useful and almost indispensable it is a pity they should so often be doomed to disappointment, — their sanguine expectations being blighted by the inevitable decrees of science. Happily, however, they are not the kind of men to be easily discouraged. Being naturally enthusiastic and hopeful they never give up. If one trip to the mountains fails of reward they are ready to undertake another. They know of another good place to prospect, or have overlooked something that they would like to go back and examine, anyhow, and so they are ever kept on the tramp, these brave and hardy men, a light heart within and a hopeful future before them.

Change in the Mining Department of the University.

During the last vacation a change has been made in the instructions of the mining department of the University of California. Mr. Geo. Becker, who has for a number of years given all the special instruction to the mining students, resigned to accept a position on the United States Geological Survey. Having made this instruction a study for some time, and having directed the furnishing of the new building so recently erected for mining and mechanics, and, thus understanding its best managements, the institution looses in Mr. Becker a valuable aid.

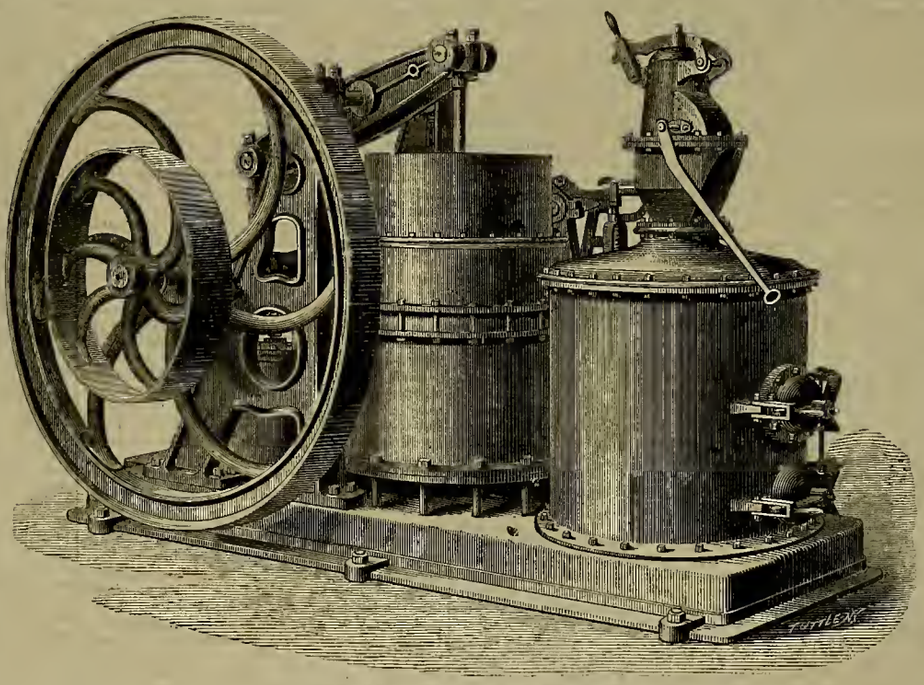
As successor Mr. S. B. Christy, formerly an associate editor on the MINING AND SCIENTIFIC PRESS, has been appointed. Mr. Christy is a native Californian, has graduated in and grown up with the University. Since graduating, Mr. Christy has acted as instructor in qualitative chemistry, and has thus gained ample experience in the act of instructing. He has also employed a great deal of time in putting forward his special studies in metallurgy and higher mechanics, which will greatly aid him in his new position.

THE FLOODED MINES IN THE COMSTOCK.—Of late excellent progress has been made in draining the water from the flooded mines. The pumps are all working splendidly, and Aug. 27th there was but 35 feet of water (measuring on the slope, or 18 feet vertically) above the 2200 level. As they are now handling a certain amount of accumulated water they will have an easier task when they reach the 2200 level, and have to do with the regular influx only. Useless some unlooked-for accident shall occur it will not be long before the 2200 will be seen and the volume of water flowing into the mines at that point ascertained.

The Brown Caloric Engine.

For the past 50 years experiments have been tried in hot air, which proved the possibility of the use of that power, but the non-perfection of construction of the machines caused partly failures and partly limited results only. Mr. Felix Brown, after several years experimenting, finally brought out the engine shown in the engraving, one of which is on exhibition at the Mechanics' fair, by Parke & Lacy, Agents, 417 Market street.

In this machine, the heater, or furnace, is completely separated from the working cylinder, so that the former may easily be relined with fire bricks, should it become necessary. The packings are not exposed to heat. The inlet and outlet valves are operating independent of each other, so that any degree of expansion desired may be obtained. Noiseless motion and the facility of replenishing the furnace during working hours without the cause of any delay are among the merits of the engine. The manufacturers state that the consumption of fuel is only from two and one-half to three pounds of coal per horse power per working hour. The construction of the engine is strong, all the bearing parts, journals, shafts, rods, etc., being made of cast steel, or case hardened. The engine is particularly useful as a motor for elevators or hoists.



THE BROWN CALORIC ENGINE.

SILVER.—The annual production of silver is estimated at $80,000,000 in value, more than one-half of which is brought out of our mines. Of this amount not less than one-fourth enters into consumption in the mechanic arts. From a report made to the British Parliament, in 1876, we learn that in 1871, of the nations under the silver system, the populations aggregated 841,000,000; of the gold and silver system, 139,200,000; of the gold system, 85,720,000. At the time of the report (1876), the following changes had been wrought in the three systems: Populations under the silver system, 717,600,000; under the gold and silver system, 97,800,000; under the gold system, 247,720,000.

AT Memphis new cases are occurring every day. Howard Association expenses are $1,000 per day. All who can leave have fled.

Resistance of Metals to Repeated Shocks.

About 12 years ago, the Prussian government directed Wohler to make a series of experiments upon the resistance of iron and steel to repeated stresses. The results of his experiments are known as Wohler's laws, which is described in Dr. J. J. Weyrauch's work on "Strength and Determination of Dimensions of Structures," translated by Dubois. "Rupture may be caused not only by a steady load which exceeds the carrying strength, but also by repeated applications of stresses, none of which are equal to the carrying strength. The differences of these stresses are measures of the disturbance of continuity, in so far as by their increase the minimum stress which is still necessary for rupture diminishes."

An illustration of the meaning of the first portion of this law is as follows: If 50,000 pounds once applied will just break a bar of iron or steel, a stress very much less than 50,000 pounds will break it if repeated sufficiently often. Repeated experiments have fully confirmed this law.

William Kent, in a paper before the American Institute of Mining Engineers, remarks upon this law, and regards as a fact that rupture may be caused by a succession of *shocks* or *impacts*, none of which alone would be sufficient to cause it. Wrought-iron will crystallize by repeated blows in service and become weaker than cast-iron. Iron axles, the piston rods of steam hammers, and other pieces of metal subject to continuously repeated shocks invariably break after a certain length of service. In other words, the "life" of the metal is limited. Iron rods in bridges sometimes crystallize and break, although the rods in most of our iron bridges of to-day may have 5, 50, or 500 years of life yet allotted to them, due to their factors of safety.

It is well known that wrought-iron subjected to continuous vibration assumes a crystalline structure and its cohesive powers become much deteriorated, and here our knowledge stops. Mr. Kent thinks it probable that a similar law may hold true in regard to repeated shocks.

The investigation of this subject is attracting considerable attention, all the more since steel is replacing iron in many situations. In experiments made by Mr. William Metcalf in 1877 resulted in the knowledge that high carbon steel was better adapted to resist repeated shocks and vibrations than low carbon steel. Further experiments are necessary, and in this view an apparatus has been contrived to test directly the relative resistance of metals to repeated shocks, and which, it is believed, will increase our knowledge upon the relative tensile strength of steel and wrought-iron in regard to resisting repeated shocks, and also as to the general changes that occur in the disturbance of cohesion. Possibly the influence of the chemical constituents may be ascertained and measured.

The piece to be tested is laid upon an anvil and supported by being fastened into a holder or sleeve. A revolving shaft raises and lets fall an annular weight upon the test piece. Sixty blows per minute may easily be given.

If one-half the information claimed for this testing machine can be obtained, it will practically accomplish a practical result which heretofore has been mere theory.

THE Zulus have finally been beaten, but Cetewayo keeps up the war single-handed. Sir Garnet Wolesley is straining every nerve to catch him.

IT is rumored that Russia has ordered from American shipbuilders vessels to the value of 25,000,000 roubles.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS

Concrete as a Substitute for Stone in California.

EDITORS PRESS:—Artificial stone, or concrete, has been more or less used for ages, and the committee appointed by one of the scientific societies of London to examine the pyramids of Egypt, made so thorough an examination of the material composing those remarkable preservations of stone, that no doubt was left in their minds of the fact that they were concrete, or artificial productions; and the strongest proof of their being artificial was the fact that analysis showed them to be a silicate of lime, quite uncommon in that country, and finding large deposits of amorphous silicate, was forced to the conclusion that the obelisks that had stood the devouring tooth of time for so many centuries, was a silicate of lime produced by the association of the materials indigenous to that country. Through Mexico and Central America can be found the strongest evidences of the artificial production of stone built by a prehistoric race, and an examination of some of the ruins give unmistakable evidences of having been formed from a plastic state; and if we reason from analogy, the proofs are conducive that artificial stone can be made more durable than that which nature furnishes, for we know that the lofty mountain crumbles beneath the elements, and the reason is obvious: The natural stone, being more porous, admits the moisture and this subtle element insinuates itself into the body of the material, and particle after particle drops from the mass and the "mountain comes down to the valley." But not so with artificial stone; it is far more compact and less porous, presenting to the elements almost, if not quite, a perfect surface; for a good concrete is, or should be, quite impervious to water.

In the old country we now have vast aqueducts, bridges, viaducts, sea-walls and depots constructed of this material, and the strength and durability are beyond question, while their beauty and artistic finish are not equaled by any cut stone of the finest design.

Much experimenting has been done in the way of manufacturing a building stone, but did not prove a perfect success until the introduction of the Portland cement; but with the use of that, stones of any and all kinds have been made so successfully that the wonder is that they are not more extensively used.

After the great fire of Chicago several companies were organized and many buildings were erected that have proven to be not only permanent, but superior to the best brick. I find many of your sidewalks artistically laid with artificial stone, fitting accurately to all the irregularities of the location. A notable illustration can be seen around Gov. Stanford's residence. Although there are many places where it has proved quite as convenient and lasting, my purpose in writing this article is to call attention to the fact that no country in the world could use it to better advantage than our own State of California, as good material is abundant and the best cement in the world made at your very doors by the California Portland Cement Co., whose works are at Santa Cruz, and who can furnish any amount at the same price the imported article can be had for, and which will be found superior to the imported article. And as there is no freezing and thawing in this country to affect the stone until it becomes perfectly hard, it must necessarily be permanent, and experience has proved that in a uniform climate like that of California, the induration continues for a few years, until a perfect silicate of lime is formed; then the stone remains permanent, as the surface upon examination is found to be entirely free from pores, and consequently waterproof.

The writer has seen and examined a variety of articles at Chicago, that were so perfect in form and hardness that we were much surprised at the success attained in window caps and sills, doorsteps, brackets, cornices, eave-troughs, conductors, coping stone and fence foundations, cemetery ornaments of the most beautiful and artistic design, and so much cheaper than cut stone.

New methods of uniting sand, gravel and other materials into building blocks were freely explained and the result was more than satisfactory to those who have used them, and when the community becomes educated to the value of this mode of stone work it will be universally adopted at a great saving of expense and a more beautiful and permanent system of building.

One objection urged against brick or stone edifices in this city is the amount of moisture in the atmosphere arising from the fogs that come up from the ocean, rendering the houses damp and uncomfortable. This difficulty arises from the porosity of the material used in building, and continued dampness of the atmosphere at certain seasons of the year; and as solid walls are built, the moisture penetrates through the wall, making the house damp, but if concrete brick are used, such as are used in the Eastern States, that are made hollow, and properly laid up they form a double wall, having an air space throughout the entire center, thus breaking up the effects of capillary attraction and leaving the inside wall always dry. In addition to this advantage the concrete is indurating from month to month and the sanitary condition of the building constantly improving, so that a perfect building could be secured by the use of this kind of material.

The crude material for making concrete is more abundant in this country than any that has ever come under the observation of the writer, and now that this important factor has been taken hold of and can be supplied in any quantity at a fair price (we mean California Portland cement), it is to be hoped that parties contemplating the erection of a fine residence will not loose sight of this cheap and substantial mode of building, for they will certainly secure a residence that will give a more uniform temperature than any other building that can be erected, and that will stand the climatic changes for centuries, for the writer has seen many evidences of the durability of this kind of material.

Its application need not be confined to the erection of buildings, but fence posts, hitching posts, stone steps, etc.; and in speaking of stone steps, we once saw a hollow stone step, the upper surface, where the largest amount of wear would be found, was two inches thick, while the rest of the block was only one inch and could be handled by two men easily; they had been in use for over four years, and their hardness was much greater than any native stone. The same party exhibited two gate posts that had been made on the ground and in position by forming them in a board mold, and quite a long line of fence posts after a similar manner, all in a perfect condition.

The enterprising gentleman had taken his formula from Musprat's Chemistry (so he told me) and had made some improvements that were not only lasting, but ornamental at a cheap rate. Others can imitate and be largely benefited. The following proportions will give good results: For pavements and curb stones, 30 parts of Portland cement; 50 parts of sharp, clean sand; 50 parts of gravel or finely broken stone, such as granite, bay salt or crystallized limestone—should be broken to the size of a pea; 50 parts of pulverized brick. The whole should be thoroughly mixed before adding the cement; and in the selection of the cement, ask for the slow-setting cement, as this enables you to make a larger batch at a time.

For fine work, such as fence posts and ornamental work, the following will be found to be suitable: 30 parts of cement (Portland); 50 parts of sand; 80 parts pulverized crystallized limestone, and the finer it is pulverized the smoother will be the work, as it has been demonstrated that the fine particles settle on the outside, making the work very smooth. If the posts are formed in position, as I have seen them done, then coarse fragments of stone can be pushed into the mold, care being taken not to allow the rough parts to project.

The above formula makes a fine chimney-top and can be colored to taste by a small percentage of ocher added to the mass while being mixed, and ocher containing oxide of iron, is beneficial in producing hardness and smoother surface. For the erection of houses a much coarser kind of material may be used, such as spare stone from the quarry, broken bricks, cobble stones, etc., and are used by making the cement mixture a little thinner and forcing the fragments into the mass while the form is still in position on the wall. And in a country where sand and stone can be had for hauling, the only ingredient to be bought will be the cement, and under these circumstances it is cheaper than wood at very common prices, and any person of ordinary skill can build his own house. In traveling through your State, I have seen locations where lumber was very high and stone on the ground in abundance, with a board shanty that would not keep the rain out cost five times as much as a comfortable house made of the material on the ground. And I lay these facts before your numerous readers that they may profit by it, for in hundreds of locations a few barrels of cement and a few days' work will insure any man a comfortable house to live in, and, in the hot weather of California, will be found to be always cool, and in wet weather always dry. Other formulas for specific work are common property and within the reach of any that desire to investigate it or put it into practical use.

It is a matter worthy the attention of any one contemplating a permanent improvement, and the writer will be pleased to give any further information to those who may desire to look into it, for having seen the most substantial benefits from its use in many ways, has no other purpose in view than laying it before the public as one of the improvements that science has clearly demonstrated for our economy and usefulness.

Experiments tried with the California Portland cement by the U. S. Engineer, Calvin Brown, Esq., and Governor Purdy, gave a result superior to anything attained by the imported article, and I refer to the fact because it reflects credit on our own citizens for taking up a matter like this and producing an article superior to any in the world; for all such enterprises should be publicly admitted and acknowledged, as they are a golden link in the prosperity of the State. J. T. D.

[We are acquainted with the writer of the foregoing communication, and any inquiry concerning the matter may be directed to this office.—EDS. PRESS.]

Eureka and Its Mines.

EDITORS PRESS:—Eureka is to eastern Nevada as Virginia City is to the western, the principal mining locality, and the main center of all mining enterprise through this section of the State. Its population, including the miners of Ruby Hill, must be 6,000, though its attending school children are only about 275; but Ruby Hill has its school separate from Eureka. The fire of last April swept away two-thirds of the east half of the place, but the whole is rapidly being rebuilt more substantially and beautifully than before, except the northern and lower part, which is on some account delayed in its improvements. The Episcopal and Methodist churches, burnt in the fire, are both restored; the first by a neat small stone chapel, the second by a good stone basement, well finished and roofed for present use, the main story to be yet put up, as more funds shall be received for the purpose. The Presbyterian and Catholic churches were to the west of the main street, and hence were saved; as also was the school-house.

The International Hotel is likely to become greatly improved, in place of the structure burned, though the $30,000 laid out for this purpose rather test the energy and resources of Mr. Hall, the enterprising proprietor. The Turner House, also, we would particularize, for the comfort of guests, and the neat, appropriate management of everything in the house.

A fine brick Court-house is being built, though there has been much public excitement because of alleged dishonest contracting.

The main machine shop and foundry of the place was burnt, yet slowly its restoration is going on, while one or two smaller shops endeavor in part to supply necessary work. Neither of the two active large mills for reducing ore was injured, though the Eureka, in the lower part of the town was in real danger. The Richmond, in the upper part, was wholly out of the range of the fire.

These two mills are now doing all the reducing for the whole district, though others are expected to start in the course of months.

From three to five immense furnaces in each mill are kept constantly charged, day and night, from year in to year out, smelting all the ore as it comes from the mines; consuming, in both mills, about 720 cords of wood a day, in the form both of coke and wood. A class of coke-burners, mostly Italians, have struck for a higher price, and resorted to arms to compel all to come to their terms, but the State authorities have taken the matter in hand, and doubtless the resistance will be crushed.

The process of smelting a stranger can never cease to admire. The two red-hot streams of melted ore are constantly running, one in front of each fiery furnace, and one at the side; the one in front a little the higher to drain off the upper, lighter, worthless matter, called slag, being earthy matter and iron; the other, lower, connected by a pipe deeper down in the melted mass, where the purer metals of heavier weight—lead, silver, gold, etc.—will not allow the surface to rise as high as the other. The fiery slag is wheeled off to be emptied from great kettles a burning stream down the front of the ever-increasing hill of waste. The metal is dipped into molds as bars, and wheeled away to a differently arranged furnace, melted over and skimmed, removing 5% of remaining impurity. From this furnace the mass is again drawn off into immense vats, and cooled in masses of over four tons. From here they are raised by power derricks, and put into another immense iron retort or furnace of 20 tons capacity, and melted, while heated steam, forced into the bottom, causes a violent boiling of the liquid mass. At length a partial cooling crystallizes the lead in part, so as to appear like wet meal. Now, opening a vent at the bottom, the uncrystallized liquid portion, by its weight, rushes out, carrying with it three-fourths of the silver and gold in the mass, while the crystallized lead remains behind. The lead drawn off, is again put through the same steam boiling process, three or four times, each time the running mass carrying away three-fourths of the precious metals with it. At the last, the whole is put into a reverberating furnace, the heat of which burns away all the remaining lead as an oxide, and leaving the pure silver with all the gold the ore contained.

This last is called the cupelling process, and ends refining.

This is the method of the Richmond mill, but the Eureka has sent most of its lead bullion for the final refining to Newark, New Jersey. The Richmond retains its refined lead bars, stacked in immense cord-wood-like rows, thousands of tons, the purest lead in the world, but the markets are overstocked at present.

Ruby Hill, where all the mining is done, is a mile and a half southwest of Eureka, higher in altitude, so that narrow-gauge railroads easily bring down the ore to the mills. The mines are in hills mightily broken and rugged, while the many small houses are perched every way on narrow ridges, crazy edges, steep declivities, deep canyons, and a few easy roadsides, widening out gradually down into moderate valleys.

Here some 2,000 people, many families, live and toil in connection with the mines. Not a tree or a green shrub or tuft of grass do we remember to have seen, except to the southeast behind an elevation, where two or three apparently scorched small remnants of rough native pines, some miner in humanity had spared. Work and toil here, every day, is the one order of life, though they do have a moderate Methodist and also Roman Catholic Church, which a few will attend. But such mining life has a powerful tendency to un-Americanize, uncivilize, unmoralize, every being of the human race in this crowd. Those who will resist the tendency and rise victors over the evil influences are heroes indeed. It is certain that everywhere Americans must have a Sabbath of rest from usual business employments. The poor working men need it a thousand fold more than they need an eight-hour law.

These mines of Eureka or Ruby Hill seem sure and permanent for ages to come. The Con. Eureka, which is the lowest, is only a little over 900 feet deep, yet the ledges are large, productive and cool, with no apparent increase of temperature. The Richmond is much the same, while the Albion, the Phenix, the Jackson, and other mines are being vigorously worked with very favorable results. Also the Ruby and Dunderberg claims are just relieved from all judicial difficulties, and this vigorone English company is expected to press their work right forward with good success. Moreover, the range rises to the south regularly into a broken elevation called Prospect mountain, where of late much prospecting is being done, with good results, so far justifying much greater expectations for the future. There seems no good reason why this mountain may not surpass all other places in the vicinity in the large yield of rich ores. S. V. B.

Kern County Mines.

EDITORS PRESS:—I have been up in this part of the country for about four weeks, and I suppose you would like to know something of what is being done in the mining department. I don't think there are over twenty quartz miners actually at work in this district, although there are a large number of very promising quartz veins in sight, on many of which work has been done in years past, and nearly all have, as far as I can learn, paid a profit. At present work is being done on the Grizzly claims, formerly the property of Mr. White, the Recorder of this district, and lately purchased by Messrs. McNulty, Fletcher and San Francisco parties. The Grizzly claims are known as the Dreadnaught, Big Grizzly and New Constitution. The main shaft of the Dreadnaught is down about sixty-five feet, in rich sulphuret rock which works $150 per ton. The owners have, within the last ten days, built a whim for hoisting purposes, and are fitting up the mine in good shape with new track, cars, tools, etc. There is considerable water encountered, which may necessitate pumping machinery. The vein is fully five feet in width, and so far promises big things. Messrs. Cunningham & Co., owners of the Recompense, are still hard at work taking out ore, among which are found a great many rich specimens. They propose contracting with the mills for the crushing of from two to three hundred tons of rock within the next few weeks. The same parties have other valuable claims which I propose to examine. Mr. C. T. White has made a rich strike in a mine he owns and is working, near White river on Bald mountain. The ledge is about eighteen inches wide, and is very rich. A small force of men are working in the Eclipse and Lee mines, taking out ore and removing waste rock, etc., preparatory to further prospecting the mines. Messrs. Garrison & Biggs are mining on the south side of Bald mountain, sinking a shaft on their ledge. They have a strong, well-defined vein fully eight feet wide between casings, but not all pay rock. The old working has paid well. The Eclipse mill is running as steady as possible, considering that there is a short supply of water, which time will cure, and enable them to run night and day, as there is plenty of rock on hand.

As my letter is becoming too long, I will close by stating that portions of this district are fairly covered with quartz veins and placer mines which would afford employment for fully one thousand miners at much better wages than can be had in cities. This will be a good mining district. Heretofore it has been butchered by adventurers, speculators and sharpers. Actual miners are now coming in, promising rich developments in the near future. B.

White River, Kern Co., Aug. 15th.

COAL IN THE BLACK HILLS.—Explorations recently made by competent experts have demonstrated the existence of most valuable deposits of coal in the quarter of the junction of the Redwater with the Spearfish creek, in the Black Hills. Veins have already been opened up from five to six feet in thickness, and the coal, of the lower part of the strata, is so free from sulphur that it has been used for smelting purposes in the home foundries at Deadwood. There is no doubt in the minds of the experts that underlying the strata already discovered, and at no great depth, other coal formations will be found, greater in thickness and of better quality. The requisite means have been secured to make further explorations and to develop this beneficent source of mineral fuel so opportunely found in that quarter.

MECHANICAL PROGRESS.

Paving Streets by Steam.

A steam rammer has lately been invented and patented designed for paving streets, and intended for use in large cities, where the great extent of street surface is composed of blocks and cobble stones, which require to be more firmly imbedded in the earth than can be done by hand.

This machine is thus described: It is operated on the same principle as the trip-hammer, and can be so regulated as to make a stroke of one pound or 1,500 pounds. This enables the operator to produce a level surface on every portion of the street it passes over, while the most expert man-power cannot strike over 200 pounds. Durability and solidity are the important features of paved streets, and while hand-power can only force the stone into the earth three inches, the steam-hammer sends them six inches with ease, thus making the stones compact and solid.

It is claimed that the streets paved with this new invention will last until the stone is worn out. So solid are the streets rendered that the heaviest laden wagon or dray cannot affect the surface.

The present machine weighs six and a half tons, and even that makes no rut or impression on the street which it has rammed. In repaving streets with cobble-stones under the old system, it is necessary to relay them, while with the steam-hammer they can be driven to a level with perfect ease. It requires the services only of an engineer and a man to guide the rammer to work the machine, and it consumes but one-fourth of a ton of coal daily.

HOROGRAPH.—Instead of the electric pen, an instrument is in use in England for supplying the means of producing rapidly and cheaply any desired number of circulars, notes, examination papers or other writings. As its name implies, it may be said to be writing by clock-work, the mechanism and the moving power being all contained in the head of the instrument. The pen itself is a needle receiving a rapid up-and-down motion in a tube held in the finger like an ordinary pencil case. It is instantaneously stopped and started by the action of the thumb. The result of its operation is to perforate the paper with fine holes at the rate of nearly 10,000 per minute, at short intervals. The sheet thus prepared constitutes a stencil, over which the passage of an ink roller will give impression after impression of clear fine writing or printing, to a practically unlimited extent, and at a speed of 300 to 400 copies per hour. From one of these stencils 10,000 impressions and upwards may be printed. The machine is free from all complexity, so simple, indeed, that no personal instruction is needed, the printed directions which accompany it being all that are required for its efficient use. It can be carried in its case in the pocket, while the whole of the printing arrangements which accompany it occupy small room and are perfectly portable. The instrument is similar to the electric pen, without the wires and battery complications.

HEATING SOLDERING IRONS.—A simple apparatus has been devised by Dr. Paquelin, of Paris, for heating soldering irons with a gas blow-pipe flame. A metallic box of the size of a thick book, the inner arrangement of which is not stated, is placed by the workman in a side pocket of his coat. He connects it with two caoutchouc tubes, one of which goes to the soldering tool, the other to a small caoutchouc balloon lying on the ground. By treading on the balloon, air is forced through the box, and therein becomes charged with petroleum vapor. The soldering tool itself is hollow, and into it projects, at the fore end of the handle, a platinum point through which the air, charged with hydrocarbon, is blown into the interior of iron in fine current. In commencing work the platinum point is first brought to a glow in a neighboring spirit lamp; it inflames the gas mixture blown through; thus the iron is quickly heated, and kept hot so long as the blast is maintained. If a short interruption occurs, it is not found necessary to heat the platinum anew at the other flame.—*Ironmonger.*

NEW ELEVATOR.—At the test made upon the large passenger elevator at the Grand Pacific hotel, Chicago, lately, by Colonel A. C. Hillithorpe, for the purpose of demonstrating the absolute safety of his patent air-cushion. The elevator was raised to the fifth floor, 85 feet from the ground, to make a trial trip. In a pail were a dozen eggs, and in another were some delicate wine glasses filled with water; the rope was loosened, and the elevator fell to the ground, stopping without injury to the occupants—men, eggs, and glasses. The device by which this is effected is a box or vat with air cells placed at the bottom of the shaft, and below the first entrance way. The depth of the cushion is regulated by the hight of the shaft. The bottom of the coach of the elevator is converted into a plunger with India rubber valves similar to any plunger for the purpose of pumping air or water. The falling coach carries the air with it, and breaks the concussion, and compels it to descend gently to the bottom, as may be seen from the fact that the water in the glasses was not spilled nor the eggs broken.

AUTOMATIC CLOCK.—Felix Meier, a Bavarian mechanic at Detroit, has built a clock which is said to surpass the famous Strasburg timepiece. It stands in an elaborately carved walnut case, 18 feet high and 7 or 8 broad, and has a dial which represents the entire planetary system, from the signs of the zodiac to the correct positions of the earth toward the sun in the different seasons, and the revolutions of all the planets about the sun at their respective distances and times. Separate dials also give the correct time at New York, London, St. Petersburg, San Francisco, and all the leading cities of the world. The big dial is supported by statuettes of William Cullen Bryant and Prof. Morse, and the case is surmounted by a bronze figure of Columbus. In carved niches at each side of the dial stands a baby, a youth, a middle-aged man, an old man and the skeleton figure of Death. The baby strikes the quarter hour on a tinkling bell; the boy, the half hour on a clear-toned bell; the strong man, the three-quarter hour on a full-toned bell, with a hammer, while the gray beard strikes a weaker bell, and then Death tolls the full hour. When the knell of the hour is gone a lively national air strikes up, and all the Presidents down to Hayes emerge from a door guarded by a colored servant, and file before Washington, who sits under a canopy surmounted by 37 stars at the top of the case. As the Presidents draw up in front of Washington, he rises and waves a copy of the Declaration of Independence. The Presidents salute him and pass across a platform and out of a door opened for them by another colored servant. Meier has spent 10 years and $30,000 on this clock.

A NOVEL AND SWIFT VESSEL.—A steam catamaran is being built at Poughkeepsie, N. Y. It differs from anything in this line ever before designed. In some respects it is similar to an ordinary catamaran, the hull being in effect an ordinary hull split in two, the halves being placed about fifteen feet apart, and the boarded perpendicular sides being exactly parallel to each other. These two half-hulls are joined together by heavy beams. The width of the deck is thirty feet and the length seventy. The hulls of Mr. Merritt's catamaran will be fifty-one feet on the keel, with only seven feet beam and five feet depth, so that while the deck is almost half as wide as it is long, the hulls are very long and narrow, and will displace little water and offer no more resistance than a single narrow hull. In each hull will be placed a twenty-five horse power engine operating two wheels, so that the vessel will have four wheels, two between and two outside of the hulls. The wheels themselves are of peculiar construction, being eight feet in diameter and of the kind known as the "feathering." The paddles are not fixed, but are moveable, and by a simple latching and unlatching process are held at right angles to the water while plunging into it, and while coming out are edgewise. Thus all the power is directly applied to forward propulsions, and none whatever is wasted in lifting or depressing the vessel. It is thought that this novel craft will be able to make thirty miles an hour.

AUTOMATIC SAND-BRAKE FOR RAILWAYS.—The *Engineer* in a recent issue describes the new brake of W. Wiseman, of the Indian government railway department. On the axle of every wheel of the train is placed a cylinder, in which a circular plate keyed to the axle and bearing a number of small blades, revolves whenever the train is in motion. The blade compartment surrounds a cylindrical compartment, which, being filled with sand, is called a sand-box. The upper and the lower portion of this box are in communication with the blade-box by a number of parts, of which the lower can be opened and closed by means both of an electrical mechanism and automatically, while the upper ones, which are smaller, are always open. A plate, keyed to the axle, opens the lower sand ports with every revolution, but the sand thus escaping is so small in quantity that it is immediately swept back by the blades into the sand-box through the upper ports. As soon, however, as the electrical circuit, which also controls this sand valve by means of an electro-magnet, is broken, the sand flows from the box very quickly, and, packing the blade-box, stops the train. The same will occur as soon as the train moves too rapidly or when one or more cars are left behind. It is therefore automatic, and its effect increases with the velocity of the train. Experiments made with a 7-horse power engine were quite successful and promising.

SOME OLD PATENTS.—The New Haven *Palladium* says: A gentleman residing in this city has in his possession *fac similes* of two certificates of patents, both being of interest because of their antiquity. One bears the date of 1715, and the patent to which it certifies was the first ever granted to a resident of the United States. The grantee was Thomas Masters, of Pennsylvania, and the invention referred to is spoken of as "a new invention found out by Sybilla his wife for cleaning and curing the Indian corn growing in the several colonies in America." The certificate includes a rough sketch of the machine patented, and illustrates a very simple manner of accomplishing the work for which it was intended. The other certificate shows a sketch of the first revolving gun ever made, which is very similar in design to the Gatling gun. The invention was patented in 1718, and its purpose was indicated by the inventor as follows:

Defending King George, your country and laws,
Defending yourselves and Protestant cause.

SCIENTIFIC PROGRESS.

Sulphides as Fuel.

Mr. John Hollway has made a new application for rapid oxidation by which sulphides are utilized as fuel. The London *Journal of Arts* contains a long statement from Mr. Hollway, giving an account of his process. The matter is of interest from a utilitarian point of view, but principally from the better effects realized from the combustion of pyritous minerals hitherto regarded as nearly useless in the economy of man.

This process has for its object the utilization of the heat generated by the rapid oxidation of certain mineral substances which have not hitherto been used as sources of heat for smelting operations. The heat thus obtained is employed in the reduction of the furnace charge, which may be composed partly of sulphides and partly of siliceous ores. A current of air is forced through molten sulphides, by which means they are very rapidly oxidized. Great heat is thus developed, rendering the process of smelting a self-supporting operation; therefore no extraneous fuel is required, excepting that employed in raising steam for the blowing engines; where, however, water power is available, steam can be dispensed with, in which case all the carbonaceous fuel necessary for the operation is a little coke to start the furnaces, which stands in the same relative position to the ores as wood does to coal in the lighting of an ordinary fire.

It is well known that pyritous minerals are readily combustible, but the best means of utilizing the heat-producing property of metallic sulphides, is not so apparent as would at first sight appear. Of these sulphides, only iron pyrites is sufficiently combustible at a low temperature to burn in the open air, the mass being raised to the temperature at which the oxidation takes place solely by the union of sulphur and iron with atmospheric oxygen. In Spain there are numerous deposits of poor cupreous pyrites, and the Rio Tinto and Tharsis companies annually treat, at their mines, about 1,000,000 tons for the extraction of copper only, which does not average 2%. The process employed consists essentially in roasting the pyrites in heaps in the open air, dissolving out the copper from the roasted material and precipitating it from the solution by means of iron. These operations extend over several months, any gold or silver contained in the ore is lost, and the iron and sulphur are also wasted. The sulphur passes into the air as an obnoxious and annoying gas, desolating the country for miles around the works.

From the earliest ages, carbon has been considered a necessity in all metallurgical operations. The first reduction of metals by means of carbon forms a connecting link between the age of stone and the commencement of civilized art. It is well know that carbon burns at widely varying temperatures, as, for example, in our bodies, in a common coal fire, or in a furnace. A great deal of thought has been devoted to the subject of economizing carbonaceous fuel, and great advances have been made in this direction; yet the expenditure of coal or coke necessary, say to melt a given quantity of metal, still far exceeds the limit, because only part of the oxygen of the air passing into a furnace acts on the material to be burned, or is not brought in contact with the combustible matter with sufficient rapidity to obtain the necessary temperature for the operation.

In this new process the ores supply their own fuel. The process may be conducted in a Bessemer converter but fixed furnaces, with attached condensers, are more suitable. On melting a small charge of pyrites to start the operation, and feeding the furnaces with cold mineral, maintaining a powerful blast, a tremendous heat is produced by the combustion of part of sulphur and iron, and a variety of products are secured. Beginning with those that fly up the chimney, and are condensed, there are sulphurous acid, sulphur, arsenic, zinc, antimony and lead. Flowing from the furnace is a molten mass of what is called "regulus," containing copper, cobalt, nickel, silver and gold. This settles in the lower part of the receivers, and is covered with a slag composed mainly of silicate of iron. Among the adaptations to which this process is particularly directed is the treatment of auriferous and argentiferous pyrites. It is well known that in practice it is not possible to obtain the whole of the gold from pyrites by amalgamation with quicksilver, because the presence of sulphur and arsenic sickens and flours the mercury, whereas by fusion the whole of the silver and gold present is obtained.

REPRODUCING DRAWINGS.—Many of the difficulties attending the method of blue tracings in Pellet's process the tracing appears in blue lines on white, instead of white on blue. Prepared paper is placed under the tracing, and is exposed to the light. After a sufficient time of exposure the prepared paper is dipped into a bath of yellow prussiate of potassium, which develops the lines of the drawings in blue. It is then washed and the excess of salts of iron is carried off by dipping the drawing into a weak solution of hydrochloric or sulphuric acid.

Ancient Human Skull.

From the diary of Thomas Beal of London, who died in Colorado about one year ago, we give an abstract of the discovery by him of a human skull in a deposit, the age of which he was prevented from discussing by his sudden death. "In passing westward from the Missouri to the Rocky mountains through Nebraska, northern Kansas, Wyoming and Colorado to the upper member of the drift series, the equivalent of the brown clay of Illinois is found to be continuous up to the base of the mountains. Drift gravel is generally found below it or is contained in patches in it. Nearing the mountains the clay is of a darker color and a more sandy texture, and has often pebbles and stones scattered through it. Large boulders are also met with near the mountains, and beds of sub-angular boulders and pebbles, nearly always of crystalline rocks, skirt the flanks of the mountains, run up the sides of the valleys opening into them, and cap isolated hills in front of them to heights of about 8,000 feet above the sea.

"In the neighborhood of Denver the sandy clay covers the whole country, excepting on the steeper slopes, where it is sometimes absent denudation. It is often as much as 30 feet in thickness, and contains here and there boulders of crystalline rocks scattered through it. In some of the sections these are sufficiently numerous to make it a boulder-clay. Much of it is unstratified and with vertical joints.

"Whilst examining the sides of a cutting through this deposit on the Colorado Central railway, near the top of the low watershed between the South Platte and its tributary, Clear creek, I noticed a whitish substance on the face of the cutting. On clipping round it with a knife it proved to be the top of a human skull. It was in perfectly undisturbed loess-like clay, at a depth of three feet nine inches from the surface. At the same horizon at intervals were small angular pieces of miocene wood. No other bones were found, and none of the teeth. Seventy yards distant I found what appears to be a portion of a human rib.

"Isolated bones of other animals than man are not uncommon in the neighborhood of Denver and near the foot-hills in the brown clay and associated drift gravels. Besides those found by myself, Prof. Lakes, of Golden, and Mr. H. C. Towner, of Denver, have collected many specimens. Among these, bones of the common buffalo seem to be most frequently met with."

CONTACT OF MICROMETER SCREW.—Mr. A. S. Kimball, in an essay on magnetic strains in iron, describes a method used by him to detect the contact of micrometer screws, which is of value as it is applicable in very many physical and mechanical experiments. In the case in question the micrometer screw had 60 threads to an inch, and its head was graduated to 300 parts, so that the unit of measurement was the 1-18,000th of an inch. The iron bar, micrometer screw and a telephone were put in the circuit of a weak Lelanche cell. When the screw was turned up to loose contact with the bar, the familiar boiling sound of a too sensitive microphone was heard, which ceased the instant firm contact was made, the change to silence being abrupt and sharply defined. The results, Mr. Kimball says, may be trusted to one-half divisions.

GIVING FLAX THE APPEARANCE OF SILK.—A Parisian has, it is said, succeeded in preparing from silk waste a liquid which will give flax yarn, chemically prepared, a silken coating. The new material has lost its resemblance to flax, and is in fineness, elasticity and gloss a perfect substitute for the more expensive article. The inventor prepared samples on the spot, and succeeded so well that 14 manufacturers, whose names are given, formed a limited company for the purchase of the invention at a cost of 3,000,000 francs. Two days afterwards the value of shares in the new company had risen 30%. Should the process prove a success, the entire silk industry and other textile branches will be revolutionized.

A NEW MAGNETOMETER.—This new instrument is the invention of G. M. Hopkins, and consists of a concaved, horizontal, metallic plate and a chambered vulcanite cap, which hold firmly between them a steel diaphragm. Through the stuffing box of the vulcanite cap passes a glass tube of small caliber. The chamber of the vulcanite cap, which is closed by the diaphragm, is filled with mercury, so that any movement of the diaphragm, upward or downward, causes the mercury in the glass tube to rise and fall, thus indicating the force of the attractive or repulsive force exerted on the diaphragm. An instrument of similar construction serves as an electrometer.

SINGLE STORY MILLS.—It is thought that before long the cotton mills of New England will be built with one story, instead of with five or six, as at present. The advantages claimed are increased safety and convenience and a higher speed for machinery. The report of a New England gingham factory on last winter's use of a one-story building was that it covered about an acre, was built of brick with corner towers at a cost of $23,000 and saved in gas alone a sum equal to the interest on the cost of the building. The looms were driven at 12% higher speed than on the second floor of the old mill, the repairs were fewer, and less imperfect work was turned out.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Aug. 7.		Week Ending Aug. 14		Week Ending Aug. 21		Week Ending Aug. 28	
Alpha	25½	20	24½	22½	25	23	25¾	23⅜
Alta	7⅝	6½	6⅞	6½	7¼	6½	6⅞	6⅛
Andes	1.30	90c	1.30	1	1.15	1	1	90c
Alps	....	....	....	....	....	....	....	....
Argenta	1¼	1.05	1¼	1	1.05	80c	1	90c
Atlantic	....	....	....	....	50c	40c	....	....
Aurora Tunnel	25c	....	....	....	....	....	....	....
Baltimore Con	....	....	....	....	....	....	50c	....
Belcher	4.90	4.10	4.65	4	4¾	3¾	4.85	4½
Belmont	70c	40c	95c	70c	95c	90c	75c	60c
Best & Belcher	19	16½	18½	18	19	18	19¾	18¼
Bullion	6⅞	5⅜	7	6	6⅝	6⅜	7⅜	6
Bechtel	1.40	1½	1.60	1½	1⅜	1½	1.30	1⅜
Belle Isle	4¼	3⅞	3.70	3⅜	4	3.55	4.30	3⅞
Bodie	13⅞	11⅞	11⅞	10	11⅝	10⅞	11	10½
Benton	4.70	3.80	4.15	4	4⅜	3.70	4	3.80
Bulwer	9½	8¾	9¼	9	9	8½	8½	....
Boyle	....	....	....	....	....	....	....	....
Black Hawk	1.55	1.35	1.60	1.30	1.30	1¼	1.10	1
Belvidere	1	85c	1¼	90c	1¼	1	1	75c
Booker	1¼	1.05	1¼	1	1.20	1.15	1.35	1.15
Caledonia	2⅛	2.05	2.30	2.05	2½	2	2	1.70
California	5¼	4.80	5¼	5	5¼	4½	4.80	4.60
Challenge	2⅝	2½	2.60	2⅛	2.60	2¼	2.30	....
Chollar	7⅛	6	7⅛	6¾	7	6	7½	6¼
Confidence	12¼	10¾	12¼	11¼	11¾	11	11½	10
Con Imperial	1.60	1½	1.55	1.30	1.60	1.40	1.55	1.40
Con Virginia	5⅜	4.60	5⅜	5	4⅜	4.55	4.85	4.60
Crown Point	5¼	4.40	4.80	4½	4.70	4¼	4.35	4
Con Washoe	....	....	55c	50c	75c	55c	1.05	75c
Champion	55c	50c	50c	40c	50c	40c	50c	45c
Concordia	....	....	....	....	....	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	....	....
Daney	2½	....	....	....	....	....	....	....
Day	15c	....	30c	....	....	....	25c	....
Eureka Con	15	14½	15	14½	16	14¾	16⅞	16½
Exchequer	6½	5⅛	6⅞	6	6⅝	6⅛	6½	6
Endowment	40c	....	....	....	45c	....	40c	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	3¾	3.55	4	3.90	3.90	2.90	3.80	2.60
Gila	1.40	1.20	1½	1.30	1½	1¼	1.10	50c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	13	12½	14	13	13⅞	13	12⅞	....
Goodshaw	40c	30c	55c	25c	45c	....	45c	40c
Gould & Curry	11¼	8⅞	11⅝	9⅝	12¼	11¼	12½	11½
Hale & Norcross	15¾	11⅝	14½	13⅛	14½	13¼	15¼	13⅞
Hillside	1½	....	1	....	1.40	1	1½	1¼
Highbridge	....	....	....	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	20c	15c	15c	....	15c	....	10c	5c
Independence	3	2.30	2.90	2.35	2.60	2.10	2.20	2
Julia	3.10	2½	5	4½	4.55	4.10	4.35	4.05
Justice	4.10	3.60	3½	3.35	3.65	3.10	3½	3
Jackson	4	3½	4½	4¼	5	4½	5	4⅞
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	1	....
Kentuck	5½	4	5½	4.45	5	4½	4¼	4
Kossuth	25c	20c	25c	....	....	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	1.15	1	1.05	80c	1	55c	60c	50c
Lady Wash	1½	1⅛	1.35	1.15	1.30	1.10	1.20	1.10
Leopard	1.15	1	1.20	1	1	40c	60c	30c
Leviathan	40c	30c	45c	25c	40c	25c	25c	....
Leeds	75c	70c	75c	....	75c	70c	....	....
Lee	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	25c	....
Modoc	1	90c	1	....	1¼	1.15	1.10	1
Manhattan	2¼	2	2	1⅞	3	2	3	2⅞
Martin White	4	3½	4	3	3.70	3	3¼	2½
McClinton	1.10	1	1	70c	1	75c	1	75c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	33⅞	21½	32¼	27	36⅞	32	35	32⅞
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	3	....	3.15	....
North Con Virginia	9½	9	9	....	9⅞	9	8½	....
New York	40c	35c	90c	75c	90c	70c	70c	60c
Northern Belle	4.40	4	4.40	4	4½	4	4	3.95
New Coso	....	....	....	....	....	....	....	....
Navajo	30c	....	35c	25c	30c	....	35c	25c
Occidental	1.05	90c	2	1	1.55	1.30	1.40	65c
Ophir	36½	30½	37	35	38	35	37	35½
Oriental	50c	25c	70c	35c	70c	35c	40c	35c
Overman	10⅞	8¼	9½	9	9⅞	9	9	8¼
Panther	....	....	....	....	....	....	....	....
Phenix	2⅞	....	....	....	....	....	....	....
Phil Sheridan	80c	35c	70c	60c	60c	40c	....	....
Potosi	5⅝	4.05	5⅞	4.60	5⅛	4.70	5½	4¼
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	3⅞	2½	3⅞	3	3⅞	95c	90c	65c
Richer	45c	25c	50c	30c	25c	10c	20c	15c
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	13⅞	10⅞	13¼	12¼	14	12⅞	12½	12⅞
Seg Belcher	....	....	25	23	....	....	14	....
Sierra Nevada	51½	37	45¼	40¼	49½	39¾	42	39½
Silver Hill	1.40	1½	1½	1¼	1⅞	1.60	1.65	1½
Silver King	6½	6	6	5½	....	....	5	4
Silver Prize	20c	....	20c	....	25c	10c	20c	....
Succor	....	....	....	....	....	....	15c	10c
Summit	1.90	1⅞	2	1.65	2	1⅞	1.80	1⅞
Scorpion	3	1.95	2.50	2	2.95	2.40	2⅞	2.30
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	20c	15c	20c	15c	35c	10c	35c	30c
South Standard	20c	....	15c	....	15c	10c	15c	....
Star	55c	50c	50c	40c	45c	40c	....	....
St. Louis	....	....	....	....	....	....	30c	....
Syndicate	6⅞	6	6	5½	6⅞	4½	7	6⅞
Tioga Con	4⅞	3.10	4.05	3.90	3.95	3½	4	3.55
Tiptop	1.10	95c	1.05	95c	95c	....	....	....
Trojan	25c	5c	30c	5c	30c	25c	30c	....
Union Con	57	27½	53	45	67½	47½	57½	50
Utah	20	14⅞	19⅞	13	22½	18½	19½	18¼
Vermont Con	....	....	....	....	....	....	....	....
Ward	2	1	2.05	1.65	2	1½	1.95	1.80
Welle-Fargo	20c	15c	20c	10c	15c	10c	10c	....
Woodville	50c	45c	60c	40c	50c	....	45c	40c
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	19⅞	15⅞	18½	16⅞	17⅞	16⅝	16⅞	15¼

Sales at S. F. Stock Exchange.

Friday A. M., Aug. 22.
180 Alta...6⅞
125 Alpha...23½@24
100 Andes...95c
335 Belcher...4.70@4.60
85 Best & Belcher...18⅛@18½
310 Benton...4@3.95
150 Bullion...6¼@6⅛
350 C Dorado...1.60
170 Confidence...11
530 Con Imperial...1.40
135 Con Virginia...4.65
290 Chollar...6¼
165 California...4.60@4.65
260 Caledonia...1.60@1.70
50 Crown Point...4.35
100 C P Ravine...25c
500 Con Washoe...75c
40 Exchequer...6½
950 Flowery...50@55c
330 Gould & Curry...11⅝@11½
195 Hale & Nor...13⅞@13⅜
55 Julia...4.30
180 Justice...3⅜@3.05
145 Kentuck...4
420 Lady Wash...1.15@1.20
510 Leviathan...25c
420 Lady Bryan...50c
50 Mackey...1.20
50 Morning Star...3.15
265 Mexican...33@32⅞
330 N Bonanza...1.40@1½
100 New York...65c
290 Ophir...35⅞@36
410 Occidental...1.40@1.35
40 Overman...8½
20 Potosi...4½
335 Scorpion...2.30@2½
100 Savage...12⅞
370 Sierra Nevada...39½@40
800 S Utah...5@10c
250 Silver Hill...1.60
10 Utah...19½
1220 Union Con...50@53⅞
130 Ward...1.80@1.85
200 Wells-Fargo...10c
350 Yellow Jacket...16¼

AFTERNOON SESSION.
3030 Argenta...80@85c
50 Adenda...50c
350 Albion...5c
500 Boston...1¼@1.30
50 B Chief...55c
855 Booker...1.15@1.20
150 Belmont...70c
250 Black Hawk...1.05@1.10
200 Bodie...10⅝@10½
765 Belle Isle...3.80@3⅞
450 Bechtel...1¼
200 Champion...45c
50 Caledonia (B H)...3¼
10 C Pacific...6¾@6¾
100 Crœsus...15c
100 Day...25c
110 Dudley...1
50 Defiance...65c
270 Eureka Con...16½@16⅝
25 Goodshaw...40c
955 Grand Prize...2.80@2.60
100 Gila...1.10
50 Hussey...10c
100 Hillside...1½
525 Independence...2@2.10
100 Jackson...5
300 Jupiter...2¼
350 Leopard...60c
190 Martin White...3¼
95 Mammoth...8
270 Mono...8¼
125 Modoc...1.10@1
100 Mt Diablo...5
730 McClintou...75@80c
20 Manhattan...2⅞
300 N Noonday...2.70@2⅞
100 Noonday...3.70
2200 N Belle Is...45c
1100 Oriental...40@35c
760 Paradise...2½@2.45
150 Real Del Monte...2½
1450 Ray'd & Ely...90@70c
100 Richer...20c
50 S Standard...15c
770 S Bodie...30@35c
125 S Bulwer...80@75c
150 Summit...1⅞
145 Syndicate...6½@6⅞
205 Tioga Con...3.55@3.60
35 Tuscarora...10c
300 University...30c
100 Vortex...60@55c
110 Wales...6⅞

Saturday A.M., Aug. 23.
75 Alpha...25
310 Alta...6⅝@6⅞
210 Argenta...90c@1
100 Albion...5c
120 Best & Belcher...18⅞
760 Belcher...4.70@4⅞
735 Bullion...6¼@6⅛
100 Benton...4
190 Bodie...10⅞@10⅝
870 Black Hawk...1.05@1
350 Bechtel...1¼
3410 Belle Isle...4@3.90
1360 Booker...1¼@1.35
75 California...4.65@4.60
40 Chollar...6½@6⅝
275 Crown Point...4.30
290 Con Virginia...4.70@4⅞
2500 Con Imperial...1.55@1½
30 Confidence...11
300 Caledonia...2
150 Challenge...2.30
400 C P Ravine...25c
60 C Pacific...7@6⅞
5 Dudley...1
100 Day...25c
145 Exchequer...6¼@6⅜
110 Endowment...40c
350 Flowery...50c
730 Gould & Curry...11½@11⅝
100 Geo Douglas...40c
155 Grand Prize...2.90@2.80
50 Gila...85c
435 H & Norcross...14¼@14½
480 Hillside...1.45
220 Independence...2.10
250 Julia...4¼@4.30
155 Justice...3@3.05
200 Jupiter...2½
100 L Wash...1.20
1360 L Bryan...50@60c
90 Leviathan...25c
1200 Leopard...55c
910 Mexican...34@33¼
325 Mackey...1¼@1.30
100 Mountain View...2.60@2⅞
200 Modoc...1.10
90 McClinton...75c
195 Mono...8¼@8⅜
1100 M White...3
100 Mt Diablo...4⅞
600 New York...70@65c
300 N Bonanza...1¼@1.35
900 Navajo...35@30c
420 N Belle Is...45@50c
365 Ophir...35⅞@36¼
90 Occidental...1.40
10 Overman...8¼
600 Oriental...40c
50 Orient...20c
295 Potosi...4.60@4.65
200 Plutus...1¾
225 Paradise...2⅛
30 Queen Bee...55c
290 Raymond & E...65@70c
510 Sierra Nevada...40@41½
900 Silver Hill...1.60@1.65
330 Scorpion...2⅛
1350 S Utah...10@5c
455 Savage...13½@13⅞
10 Summit...1⅞
450 Syndicate...6⅞@6⅛
300 S Bulwer...65@60c
50 Trojan...30c
845 Tuscarora...5@10c
325 Tioga Con...3.60
145 Utah...19@19½
820 Union Con...53@52½
60 University...25c
100 Woodville...45c
100 Welle-Fargo...10c
50 Wales...7
260 Yellow Jacket...16@15½

Monday A. M., Aug. 25.
50 Alpha...24
250 Alta...6½@6⅝
350 Andes...90c@1
115 Best & Belcher...18½@18⅞
210 Bullion...6@6⅛
530 Belcher...4.60@4¾
110 Benton...4
600 C Dorado...1.60@1.55
40 Confidence...10¼@10½
360 Con Virginia...4.60@4.65
185 Chollar...6½
385 California...4⅞@4.65
460 C P Ravine...25c
500 Con Washoe...90c
600 Crown Point...4.20
70 Exchequer...6⅛
250 Flowery...50@55c
330 Gould & Curry...11⅜@11⅝
265 Hale & Nor...14@13⅞
35 Julia...4.05
160 Justice...3.05
55 Kentuck...4
250 Lady Wash...1.15
250 Leviathan...25c
335 Mexican...33½
100 Mackey...1.20
430 New York...65@70c
50 Occidental...1.30
275 Ophir...35½@36
100 Potosi...4.85
900 Savage...13½@13¼
25 Silver Hill...1½
40 Succor...10c
100 Sierra Nevada...40⅞
800 S Utah...5@10c
300 Senator...20c
50 Scorpion...2.45
200 Trojan...30c
30 Utah...19@19½
390 Union Con...53@52½
200 Wells-Fargo...10c
170 Ward...1.90@1.95
535 Yellow Jacket...15⅞@15½

AFTERNOON SESSION.
100 Albion...15c
1000 Argenta...90c@1
100 Adenda...50c
50 Belvidere...1
630 Black Hawk...1.10@1
10 Bulwer...8½
220 Bodie...10¼
770 Bechtel...1.30@1¼
350 Boston...1⅜@1.30
1140 Belle Isle...4.30@4¼
810 Booker...1¼
670 Champion...50c
8 Caledonia (BH)...2½
20 C Pacific...6⅞@7
250 Defiance...60c
270 Dudley...1
200 D Standard...60c
595 Eureka Con...16½@16⅞
15 Golden Terra...12⅞
50 Grand Prize...2.85
1550 Gila...70@75c
200 Hussey...10c
100 Hillside...1.40
525 Independence...2.20@2.10
20 Jackson...4⅞
600 Leopard...50@45c
100 McClintou...85@90c
25 Manhattan...2.80
335 Mt Diablo...4⅞
300 May Belle...25c
100 Mono...7⅞
105 M White...3
500 Mammoth...8½@8⅞
100 N Belle Is...50c
350 Navajo...35c
10 Northern Belle...4
1000 Oriental...40c
350 Orient...20c
1140 Paradise...2½@2.60
200 Queen Bee...55c
145 Real del Monte...2½
210 Raymond & Ely...65@75c
50 S Bulwer...60c
100 Silver King...4
300 Syndicate...7@6⅞
20 Summit...1⅞
245 Tuscarora...5@10c
235 Tioga Con...3⅞@4
950 University...25c
60 Wales...6⅞

Tuesday A. M., Aug. 26.
80 Alpha...25@24⅞
350 Alta...6⅞@6⅝
150 Andes...95c
380 Bullion...6⅛
400 Benton...3.90
585 Belcher...4¾@4.85
25 Best & Belcher...18⅞@19
165 California...4⅞@4.70
100 Con Virginia...4.60@4.65
80 Chollar...6½@6⅝
25 Confidence...10¼@10
450 Con Dorado...1.85
150 C P Ravine...25c
300 Caledonia...1.90@2
50 Con Washoe...1
270 Crown Point...4.20
60 Con Imperial...1.45
170 Exchequer...6½@6
40 Flowery...45c
220 Gould & Curry...11⅞
440 H & Norcross...14
185 Justice...3@3.05
85 Julia...4.15@4.20
100 Kentuck...4.10
400 L Bryan...55c
560 Lady Wash...1.15@1.10
250 Mexican...34½@35
100 Mackey...1.15
50 North Con Vir...8½
150 New York...65c
300 N Bonanza...1.35
180 Ophir...36⅞
160 Overman...8⅞@8½
50 Occidental...1.20
20 Potosi...4.55
210 Savage...13½@13⅝
350 S Utah...5c
200 St Louis...30c
300 Silver Hill...1.55
225 Scorpion...2½@2.40
200 Succor...15c
55 Sierra Nevada...41½@42
55 Utah...19@18⅞
475 Union Con...56½@57½
150 Ward...1.85@1.80
150 Woodville...45c
100 Yellow Jacket...15⅞@15½

AFTERNOON SESSION.
910 Argenta...90c
800 B Chief...50c
200 Boston...1.30
500 Black Hawk...1.05@1
300 Booker...1¼@1.20
350 Belvidore...90c@1
150 Belmont...60c
65 Bodie...11
285 Bechtel...1.20@1¼
565 Belle Isle...4.15@4¼
1010 Champion...50@45c
300 Crœsus...15c
25 C Pacific...7@6⅞
200 Caledonia (B H)...2⅛
40 Dudley...1.10
50 Day...25c
125 Eureka Con...16½@16⅞
75 Giant & O A...6
60 Goodshaw...45c
200 Grand Prize...3.80
1590 Gila...50@60c
300 Husey...5c
100 Hillside...1¼
300 Independence...2.15
5 Jackson...5
170 Jupiter...2¼@2.10
10 K K Con...1
200 Leopard...40@35c
50 Mammoth...8⅛
100 Martin White...2⅞
105 Mono...7⅞@7⅞
205 Mt Diablo...4⅞@4½
235 McClinton...90c@1
1900 N Belle Is...45@50c
100 Navajo...30c
100 Orient...20c
550 Oriental...40c
880 Paradise...2.60
175 Queen Bee...50c
55 Real del Monte...2½
200 Raymond & Ely...70c
10 Silver King...5
115 S Bulwer...60@55c
100 S Bodie...35c
70 Syndicate...7@6⅞
20 Summit...1⅞
200 Silver Prize...20c
165 Tuscarora...5c
155 Tioga...3.80@3.70
250 University...25@30c
100 Vortex...60c
40 Wales...6⅞

Wed'sday A.M., Aug. 27.
350 Alta...6½@6⅝
95 Andes...95@90c
520 Bullion...6½@6⅞
265 Belcher...4.70@4.65
90 Best & Belcher...18⅞
270 Benton...3.80@3.85
275 California...4.70
100 Confidence...10⅞
10 Caledonia...1.85
250 Con Imperial...1.45@1½
260 Crown Point...4
95 Con Virginia...4.70
250 Con Dorado...1.60
60 Con Washoe...1.05
630 Chollar...6⅞@6⅝
100 Exchequer...6⅞
300 Flowery...50c
290 Gould & Curry...11⅞@11⅝
75 Geo Douglas...40c
480 Hale & Nor...14¼@14½
395 Julia...4.15@4.10
470 Justice...3
100 Kentuck...4
340 Lady Bryan...55@60c
250 Lady Wash...1.15
425 Mexican...34@34½
300 N Bonanza...1.30@1.35
10 North Con Vir...8½
400 New York...60@70c
105 Ophir...36½@36
40 Overman...8¼
250 Potosi...4.65
300 Plutus...1.90
350 Succor...15c
40 Sierra Nevada...41½@41¼
100 S Utah...5c
760 Savage...13⅞@14¼
180 Scorpion...2½
170 Utah...18½@18⅞
755 Union Con...55@57½
370 Woodville...45@40c
300 Welle Fargo...10c
120 Yellow Jacket...15½

AFTERNOON SESSION.
380 Addenda...50@45c
100 Argenta...80c
100 Belmont...75c
480 Belle Isle...4.20@4½
500 B Chief...55c
200 Booker...1¼@1.20
310 Boston...1.35@1.30
20 Bulwer...8½
60 Bodie...10⅝
180 Bechtel...1.20
115 Black Hawk...1
5150 Big Prize...25@30c
250 Belvidere...75c
1400 Champion...50@45c
20 Caledonia (B H)...2½
405 C Pacific...7
230 Dudley...1.15@1⅛
950 Defiance...60@50c
140 Eureka Con...16⅞
100 Fourth of July...25c
770 Gila...50@55c
50 Golden Terra...12⅞
180 Hillside...1.30
800 Hussey...5c
370 Independence...2.20
200 K K Con...1
1520 Leopard...40@30c
925 Mono...7¼
100 Manhattan...3@2.85
300 Martin White...2⅞@2½
25 Mt Diablo...4⅞@4.65
800 N Belle Is...45c
10 Northern Belle...3.95
20 Navajo...25c
325 Noonday...3⅞
100 Orient...20c
525 Oriental...40c
1075 Paradise...2⅞@2.70
200 Queen Bee...50c
100 Richer...15c
50 S Bodie...30c
200 Silver Prize...20c
160 Syndicate...6⅞@6⅞
655 S Bulwer...60@55c
300 Summit...1⅞@1.80
500 Tioga Con...3⅞@3.60
100 Tuscarora...5c
50 Wales...6⅞

MINING SHAREHOLDERS' DIRECTORY.

Compited every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Con M Co	Nevada	10	1 00	Aug 7	Sept 11	Oct 1	Wm Willie	309 Montgomery st
Argonaut M & M Co	California	1	05	Aug 11	Sept 15	Oct 6	J L Fields	240 Montgomery st
Belcher S M Co	Nevada	19	1 00	July 21	Aug 26	Sept 16	Jno Crockett	203 Bush st
Belmont M Co	Nevada	21	30	July 1	Aug 7	Sept 2	J W Pew	310 Pine st
Belvidere M Co	California	4	25	July 9	Aug 11	Sept 6	C V Hubbard	203 Bush st
Brilliant M Co	Nevada	4	10	July 18	Aug 18	Sept 3	H S Stone	419 California st
Bullion M Co	Nevada	10	1 60	July 9	Aug 13	Sept 3	J Gruss	418 California st
Bullion M Co	Nevada	11	50	Aug 12	Sept 16	Oct 7	J M Brazell	418 California st
Caledonia S M Co	Nevada	28	50	Aug 21	Sept 26	Oct 17	R Wegener	414 California st
Champion M Co	Nevada		05	July 26	Aug 31	Sep 30	G C Hurlbut	525 Commercial st
Commonwealth Con M Co	Nevada	1	25	June 27	July 11	Aug 30	C A Moree	217 Sansome st
Dudley M Co	California	5	50	Aug 14	Sept 17	Oct 13	E C Masten	22 Nevada Block
Eagle S M Co	Nevada	14	10	Aug 4	Sept 10	Sept 30	J E Byrne	533 Kearney st
Exchequer M Co	Nevada	14	1 50	July 9	Aug 15	Sept 5	J Grues	418 California st
Flowery M Co	Nevada	2	25	Aug 6	Sept 10	Sept 30	W W Stetson	309 Montgomery st
Gold Deposit G & S M Co	California	1	25	July 25	Aug 28	Sept 16	J M Buffington	209 California st
Goodshaw M Co	California	4	25	July 9	Aug 23	Sept 30	V Fernbach	327 Pine st
Gould & Curry S M Co	Nevada	36	1 00	July 10	Aug 14	Sept 3	Alfred K Durbrow	309 Montg'y st
Julia Con M Co	Nevada	9	1 25	July 8	Aug 13	Sept 4	H A Charlee	419 California st
Justice M Co	Nevada	—	1 00	———	Sept 11	Sept 30	R E Kelley	419 California st
Jupiter M Co	California	4	25	July 5	Aug 11	Sept 4	E C Masten	22 Nevada Block
K K Con M Co	Nevada	—	1 00	Aug 1	Sept 3	Oct 1	B B Minor	309 Montgomery st
Leopard M Co	Nevada	12	50	Aug 23	Sept 26	Oct 17	Jno E Dixon	20 S F Stock Ex.
Leviathan M Co	Nevada	9	.25	Aug 6	Sept 9	Sept 30	F E Luty	330 Pine st
Manhattan S M Co	Nevada	3	1 00	July 16	Aug 21	Sept 12	Jno Crockett	203 Bush st
McCrackin Con M Co	Arizona	3	25	July 29	Aug 29	Sept 17	H Aug Whiting	211 Sansome st
Mexican G & S M Co	Nevada	7	2 00	July 11	Aug 14	Sept 4	C L McCoy	203 Bush st
North Bonanza M Co	Nevada	3	25	Aug 13	Sept 17	Oct 7	W W Stetson	309 Montgomery st
New York M Co	Nevada	19	40	July 8	Aug 9	Aug 29	D L Thomas	203 Bush st
Original Keystone S M Co	Nevada	2	25	July 28	Sept 1	Sept 28	F E Luty	330 Pine st
Real Del Monte M Co	Nevada	7	1 00	June 10	July 19	Aug 23	C V D Hubbard	203 Bush st
Savage M Co	Nevada	38	1 00	July 8	Aug 11	Aug 30	E B Holmes	309 Montgomery st
Silver Hill M Co	Nevada	7	50	July 10	Aug 14	Sept 4	W E Dean	203 Bush st
South Bodie G M Co	California	1	25	July 18	Aug 25	Sept 17	H Deas	309 Montgomery st
South Bulwer	California	4	15	July 16	Aug 20	Sept 12	Wm Stuart	320 Sansome st
Tellurium G & S M Co	California	19	10	Aug 1	Sept 1	Sept 24	J M Litchfield	415 Montgomery st
Trojan M Co	Nevada	11	25	July 14	Aug 18	Sept 8	David Wilder	328 Montgomery st
Tuscarora M & M Co	Nevada	4	10	Aug 2	Sept 6	Sept 30	M E Sperling	309 California st
University G M Co	California	3	20	Aug 21	Sept 24	Oct 15	W L Oliver	328 Montgomery st
Union Con S M Co	Nevada	14	2 00	July 31	Sept 4	Sept 23	J M Buffington	309 California st
William Penn	Nevada	5	05	July 12	Aug 20	Sept 15	O J Humphrey	328 Montgomery st
Yellow Jacket S M Co	Nevada	33	1 00	Aug 4	Sept 8	Oct 8	Mercer Otey	Gold Hill, Nevada

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Crœsus G & S M Co	California	2	10	Aug 22	Sept 23	Oct 11	E Huestie	328 Montgomery st
Curtie Con M Co	Nevada	1	10	July 11	Aug 11	Aug 30	H S Stone	419 California st
Dudley M Co	California	5	60	Aug 14	Sept 17	Oct 13	E. C. Masten	309 Montgomery st
Harrington M Co	California	1	20	Aug 11	Sept 18	Oct 8	W W Bausman	426 California st
Hussey Con G & S M Co	Nevada	9	15	Aug 25	Sept 30	Oct 21	Jno E Dixon	20 S. F. Stock Ex.
North Scorpion M Co	Nevada	1	10	Aug 11	Sept 20	Oct 10	T B Ludlum	318 Pine st
Original Keystone S M Co	Nevada	2	25	July 28	Sept 1	Sept 28	F E Luty	330 Pine
Occidental M Co	Nevada	5	50	Aug 11	Sept 15	Oct 6	A K Purbrow	309 Montgomery st
Oro M Co	California	2	05	———	Aug 4	Aug 23	Wm Stuart	320 Sansome st
Paradise Valley M Co	California	—	25	———	Aug 18	Sept 8	———	13 Safe Deposit Building
Queen Bee M Co	California	4	10	July 10	Aug 30	Sept 2	T A White	113 Leidesdorff st
San Pedro G & S M Co	California	2	05	July 29	Aug 29	Sept 15	T A White	113 Leidesdorff st
Sherwood Con M Co	Nevada	1	25	July 12	Aug 12	Aug 30	H S Stone	419 California st
Swansea M Co	California	1	10	June 14	Aug 4	Aug 25	F N Delaney	315 California st
Richer M Co	California	3	25	July 13	Sept 3	Sept 23	W H Lent	309 Montgomery st
Wide Awake M & P Co	Arizona	7	02	June 23	Aug 1	Sept 1	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Addenda G & S M Co	California	T H Dixon	238 Montgomery st	Special	Sept 4
Addenda G & S M Co	California	T H Dixon	238 Montgomery st	Annual	Sept 4
Bodie Hydraulic M & W Co	California	E C Masten	22 Nevada Block	Annual	Sept 9
Crown Pt Ravine G & S M Co	———	J M Buffington	309 California st	Annual	Sept 1
Dudley M Co	California	E C Masten	22 Nevada Block	Annual	Sept 8
Golden Gate M Co	———	Otto Metche	328 Montgomery st	Annual	Sept 1
Grand Prize M Co	———	John E Dixon	S. F. Stock Ex.	Annual	Sept 16
Headlight M Co	———	A W Roee	302 Montgomery st	Annual	Sept 3
Jupiter M Co	California	E C Masten	22 Nevada Block	Annual	Sept 15
Mammoth Grove M Co	———	Directors	328 Montgomery st	Stockholders	Sept 9
Mono G M Co	California	Wm H Lent	62 Nevada Block	Annual	Sept 4
Northern Belle M & M Co	———	Wm Willis	309 Montgomery st	Annual	Sept 8
Queen Bee M Co	California	Thos A White	113 Liedesdorff st	Annual	Sept 1
South Standard M Co	California	C A Sankey	331 Montgomery st	Annual	Sept 11
Tuscarora M & M Co	———	M E Sperling	309 California st	Annual	Sept 10

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Belle Isle M Co	Nevada	John E Dixon	Stock Exchange	50	Aug 5
Bodie Con M Co	California	W H Lent	Nevada Block	1 00	Aug 1
California M Co	Nevada	C P Gordon	23 Nevada Block	50	Aug 17
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	60	Aug 16
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	1 00	July 21
Independence M Co	Nevada	John E Dixon	Stock Exchange	25	Aug 21
Indian Queen M & M Co	———	A K Durbrow	69 Nevada Block	20	Aug 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	July 26
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	30	July 28
Montezuma M & M Co	———	J T McGeoghegan	318 Pine st	25	Aug 12
Standard Con M Co	California	Wm Willis	309 Montgomery st	50	Aug 12

SALES OF LAST WEEK AND THIS COMPARED

Thursday A.M., Aug. 21.
240 Alta...6⅝@6½
50 Alpha...23½@23½
320 Andes...1
210 Best & Belcher...18½
400 Belcher...4⅞
280 Bullion...6½@6½
330 Benton...3.70@4
240 Con Virginia...4.60
260 Chollar...6½
325 California...4.60
135 Crown Point...4⅞@4.30
80 Confidence...11
650 Con Imperial...1.40
130 Caledonia...2@2.05
80 Challenge...2.40@2¼
150 C P Ravine...75c
300 Con Washoe...70c
350 C Dorado...1½@1.40
290 Exchequer...6¼@6⅞
995 Flowery...50@55c
415 Gould & Curry...11¼@11⅞
100 Geo Douglas...40c
295 Hale & Nor...13¼@13½
330 Justice...3¼@3.10
425 Julia...4.10@4.30
1000 L Bryan...55@65c
275 Lady Wash...1.15@1.10
355 Leviathan...25c
1075 Mexican...32½@32
580 Mackey...1.30@1.20
50 Morning Star...3
550 New York...75@70c
115 N Con Vir...9
165 Ophir...35½@35
90 Overman...9½@9
240 Occidental...1.35@1.40
200 Potosi...4⅞@4.70
210 Savage...12⅞@12⅝
345 Sierra Nevada...39⅜@39½
120 Silver Hill...1.70@1.65
570 Scorpion...2.40
1450 S Utah...5c
130 Utah...18½@18⅞
535 Union Con...48@47½
210 Ward...1⅞
550 Woodville...50c
400 Wells-Fargo...10c
200 Yellow Jacket...16½@16⅞

AFTERNOON SESSION.
450 Addenda...40@50c
150 Albiou...5c
650 Argenta...80@90c
650 Boston...1¼
40 Belvidere...1
475 Black Hawk...1¼
165 Booker...1.15@1.10
600 B Chief...60c
10 Bulwer...8½
40 Bodie...10⅞
770 Belle Isle...3.70
200 Bechtel...1.30@1¼
300 Belmont...70@85c
250 C Pacific...7@5
800 Champion...50@45c
100 Day...30c
255 Dudley...1
100 Endowment...40c
60 Eureka Con...16⅞@16
50 Golden Terra...13
100 Goodshaw...40c
550 Grand Prize...2.90@2⅞
510 Gila...1.20@1.15
450 Hillside...1½
14·0 Independence...2
75 Jackson...5½
160 Jupiter...2¼
3160 Leopard...55@60c
50 McClinton...75c
660 Martin White...3½@3¼
80 Mammoth...7⅞
750 Mono...8½@8
220 Manhattan...1⅞@1.65
20 Mt Diablo...5
55 Noonday...3⅞
1000 N Belle Is...45c
170 N Noonday...2.80@2⅞
300 Orient...20c
1800 Oriental...25@35c
500 Paradise...2.45
250 Queen Bee...50@55c
300 Richer...20c
960 Raymond & Ely...95@90c
200 S Bulwer...75c
350 Syndicate...5⅞
200 Silver Prize...20c
50 Star...40c
200 S Bodie...35c
150 Summit...1.70@1
445 Tioga Con...3.60@3
50 University...30

Thursd'y A. M., Aug. 28.
275 Andes...1@90c
310 Alta...6⅝
45 Alpha...25¼
185 B & Belcher...19@19½
260 Belcher...4⅞@4.70
970 Bullion...7¼@7⅞
500 Baltimore Con...50c
230 Benton...3.95@3.90
300 Caledonia...2@1.95
330 California...4.80
460 Con Virginia...4.80@4.85
550 Chollar...7@7¼
1875 Con Imperial...1.55@1½
450 Crown Point...4@4.05
100 Confidence...11¼@11
683 C P Ravine...25@20c
300 Con Dorado...1.70
555 Exchequer...6½
650 Flowery...55c
220 Gould & Curry...12½@12¼
100 Geo Douglas...40c
510 Hale & Nor...15@15½
305 Justice...3
345 Julia...4.35@4.30
85 Kentuck...4¼
570 Lady Bryan...60@55c
250 Lady Wash...1.10@1.20
455 Mexican...34½@34¼
400 Mackey...1@1.05
100 Mt View...2.85@2⅞
950 New York...65@60c
280 N Bonanza...1.40
535 Ophir...37@36⅞
15 Overman...8½@9
10 Occidental...65c
990 Potosi...5½
955 Savage...15¼@14⅞
185 Scorpion...2½@2⅞
150 Sierra Nevada...42
100 Silver Hill...1.60
15 Seg Belcher...14
200 Succor...10c
550 S Utah...10@5c
165 Utah...19@18¼
395 Union...57½@57
50 Woodville...40c
240 Ward...1.90@1.85
275 Yellow Jacket...16⅞

AFTERNOON SESSION.
200 Albion...15c
1290 Addenda...50c
1130 Argenta...80@75c
500 B Chief...55c
100 Black Hawk...1
430 Booker...1¼@1.20
100 Boston...1.35
30 Bulwer...8⅞
1600 Big Prize...30c
100 Bodie...10⅞@11
635 Bechtel...1¼
1170 Belle Isle...4¼@4.30
45 Belmont...75c
250 Belvidere...80c
180 Champion...45c
380 Con Pacific...7
50 Dudley...1.05
50 D Standard...40c
600 Endowment...50c
255 Eureka Con...16⅞
10 Giant & O A...5½
45 Grand Prize...3¼
250 Gila...55c
1080 Hussey...5c
105 Hillside...1½@1.40
500 Independence...2.15
80 Jupiter...2.10
170 K K Con...1
300 Leopard...30c
100 Leede...70c
645 M White...2.35@2.30
155 McClinton...85c@1
100 Mammoth...8⅞
360 Mono...7¼@7½
200 Manhattan...2.85@2.95
100 Northern Belle...3½@3⅞
395 Noonday...3⅞
240 Navajo...25c
920 N Belle Is...45@50c
600 Oriental...40c
70 Paradise...2.95
200 Queen Bee...60c
300 Raymond & E...70@65c
100 Real del Monte...2
200 Star...40c
750 S Bulwer...60@55c
30 Summit...1.70
430 Tioga Con...3.60@3.65
400 Tuscarora...5c
250 Tiptop...85@90c
50 University...25c
50 Vortex...65c
75 Walce...7¼

Pacific Board—Latest Sales.

Wed'sday A.M., Aug. 27.
40 Andes...90c
30 Alta...6⅞
20 Best & Belcher...18⅞
70 Bullion...6½@6⅞
170 Benton...3.85@3.90
70 Chollar...6½
160 Crown Point...4½@4.05
5 California...4.70
60 Con Virginia...4.70
10 Con Imperial...1.45
120 Exchequer...6½@6½
60 Gould & Curry...11⅞@12
70 Hale & Nor...14¼
60 Julia...4.20
70 Justice...3
50 Mexican...34@34⅞
200 New York...70@65c
100 Ophir Con...8
100 Ophir...36⅞
50 Overman...8½
100 Silver Hill...1.60@1.55
195 Savage...13⅞@14⅞
20 S Nevada...41⅞@41½
20 Utah...18⅞
40 Union...57
20 Yellow Jacket...15⅞

AFTERNOON SESSION.
30 Alpha...25¼@25
50 Argenta...80c
40 Alta...6¼
10 Bullion...7⅛
10 Best & Belcher...19¼
120 Belcher...4.65
100 Chollar...7½
700 Con Imperial...1½
100 C P Ravine...30c
80 Crown Point...4.05
5 California...4.65
100 Con Virginia...4⅞
80 Exchequer...7
500 Flowery...45c
50 Gould & Curry...12⅞
10 Hale & Nor...15⅞
90 Justice...3@3.05
330 Lady Wash...1.20
10 Mexican...34½
350 Mono...7⅞@7½
400 N Standard...2.35
10 N Con Virginia...8½
120 Potosi...5@5½
60 Savage...15½@15
900 S Utah...4c
75 Uncle Sam...3½@3⅞
50 Ward...1.90
140 Yellow Jacket...16

California Board—Latest Sales.

Wed'sday A.M., Aug. 27.			Afternoon Session		
30	Alpha	2¼@2¼	30	Alta	6¼@6¼
20	Alta	6¼@6¼	30	Belcher	4.70
1600	Atlas	2c	20	Best & Belcher	18¾
300	Ætna (A)	12½c	60	Bullion	6¾@7¾
20	Best & Belcher	18¾@18½	10	California	4¼
130	Bullion	6¾@6½	20	Con Virginia	4.70
30	California	4.70@4½	10	Crown Point	4
30	Con Virginia	4½	30	Chollar	6¾
40	Crown Point	4½	25	Challenge	2¼
200	Con Imperial	1½	130	Caledonia	1 85
130	Caledonia	1.90	100	Crœsus	12c
150	Con Washoe	1	100	Concordia	10c
250	Dayton	10c	500	Coso Con	5c
50	Exchequer	6½@6½	100	Central	8c
40	Gould & Curry	11½@11	30	Exchequer	6½
20	Hale & Nor	14½@14½	50	Enterprise	1½
100	Julia	4@4.10	200	Golden Chariot	7c
110	Justice	3@3.05	40	Gould & Curry	12@12½
100	Kossuth	17c	40	Hale & Nor	15½
150	Lady Bryan	55c	120	Julia	4.15@4¼
30	Mexican	34@33¾	20	Justice	3
100	Mint	7c	100	K K Con	50c
200	North Carson	1c	30	Mexican	34¼
30	Ophir	36¾@36½	40	New York	65c
30	Sierra Nevada	41@41½	100	Newark	12c
150	Silver Hill	1.55	10	Ophir	36½
20	Savage	13¾	10	Potosi	4 65
100	Trojan	27c	30	Savage	14¾@15½
40	Union Con	55	20	Sierra Nevada	41½
100	Ward	1½	900	S Utah	4@2c
100	Wm Penn	10c	20	Union Con	57
20	Yellow Jacket	15¾@15½	20	Yellow Jacket	15¾@15¾

The Mining Share Market.

Although the volume of business has not been great, owing perhaps to the political excitement attendant upon the near approach of election day, prices, however, have been well sustained. The decrease of the flood in the Comstock obtained a response from the shares of those mines, and somewhat higher prices are prevailing. All things considered, there appears to be some prospects of a revival of business after election.

Emigration of Miners from England.

We notice complaints in the English papers concerning the emigration of skilled laborers, resulting from the protracted depression in trade. They state that the mining population, especially, are turning their eyes towards "fresh fields and pastures new." Complaint is not made of the great numbers emigrating, but in the misfortune that in these cases the best and most reliable workmen hive off first, so that if the exodus extends greatly, their loss will be felt when the good times expected arrive. Some are going to New Zealand, with free passage, and others are coming here.

On this coast the mining population is already large enough for the developments which are progressing. If we become overcrowded with miners, wages will naturally be lowered, and trouble among the men will ensue. We have not work enough at present here for our own skilled miners as it is, and any fresh influx is to be regretted.

Still if these men come with money enough to go to work on their own hook and develop new or partly opened mines it would all be very well; but they do not. They come expecting employment at daily wages, and crowd out our own men. These colliers are good miners when working under specific instructions, but they are not at all familiar with gold or silver mining, as Pacific coast miners are, so they don't try and do much in prospecting or opening mines.

Altogether we hope that any immigration of this sort will just at present cease. Our miners have hard enough times as it is to get steady work, and any further invading will bring harder times among them.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Bodie Con., Aug. 26th, $20,700; Northern Belle, Aug. 23d, $4,679.83; Christy Aug. 25th, $7,004; Leopard, Aug. 26th, $4,500; Grand Prize, Aug. 25th, $7,000; Independence, Aug. 25th, $6,200; Belle Isle, Aug. 25th; $23,000; Hillside, Aug. 24th, $4,400; Northern Belle, Aug. 20th, $2,974.78; Con. Virginia, Aug. 20th, $48,886.32; Martin White, Aug. 20th, $5,225.60; Alexander, Aug. 22d, $8,350.31; Northern Belle, Aug. 18th, $2,807.91; Hillside, Aug. 21st, $4,350.

Big Debts.—The debt of the United States, less cash in the Treasury, amounts to $2,027,100,265. Germany appears to have increased her small debt of late. The following will show the indebtedness of three nations at the latest returns, given in pounds sterling for convenience of comparison: Great Britain, £777,781,596; France, £967,584,280; Germany, general debt, £2,544,083; Germany, railroad debt, £13,862,656. The consolidated annuities of England, known as "Consols," pay 3% per annum.

Increased Trade.—American trade with Austria has increased enormously since the Vienna exhibition, when the people got their eyes opened to the superiority of American inventions, farm implements, tools, etc. Hundreds of thousands of sewing machines have been sold in that country, and farmers who have the means are rapidly supplying themselves with labor-saving implements of American manufacture.

The Russian and English commissioners are having trouble about the Russo-Turkish frontier.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

Volcano District Items.—*Ledger*, Aug. 23: A remarkably rich body of quartz is being operated upon by Brown & Co. on Pioneer creek. A clean-up from this rock, lately made at Mace's mill, yielded an average of $70 per ton. Q. Mason crushed by hand mortar 300 pounds of rock from his recently-discovered lead, a few miles from Volcano, and obtained the handsome result of $125. He has a shaft sunk 20 ft, and the ledge shows from 8 to 10 inches in width. At the Downs mine sinking operations are progressing. The shaft is already down about 30 ft below the levels, and the ore body shows richer than ever at the bottom. A thorough clean-up is being made at the Grass Valley gravel claim. At the Golden Gate the task of pumping out water from the shaft has been going on for a month past. The water is now all out, and a ledge of good-looking quartz appears at the bottom of the shaft. Sinking is the order of the day on the Confidence mine.

MONO.

Maryland Con.—*News*, Aug. 24: The new shaft has been straightened and sunk to a depth of 85 ft, and to-day shifts were put on at the lower level of the old incline, to crosscut and raise from a point vertical with the new shaft. The new machinery arrived at Carson yesterday, and the Chief Engineer, Mr. Rollins, who has the same in charge, will forward it without delay to the mine. The foundation for the new building is all laid, and the gallows frame ready for raising.

Vortex.—The winze from the north drift on the 250 level has reached a depth of 52 ft, and is still being sunk with all possible speed. It is the intention to connect with the west crosscut now being run from the Osceola, which will be reached at a depth of 90 ft. The ledge in the incline is still looking well and is two ft wide, of good ore. The company will commence work within a few days in the lower tunnel of the Syndicate, for the purpose of cutting the ledge at a greater depth.

Blackhawk.—Main shaft is now down 328 ft, and still sinking. Winze on 320 level, on Warren vein, is down 140 ft, in a varied formation which looks well. The east drift is now in 100 ft from the shaft, and looks remarkably well.

South Noonday.—Still drifting north on the ledge, which is looking remarkably favorable for the near presence of an ore body. Will continue to drift until the mine is thoroughly opened and ready for more extensive work and exploration.

South Belvidere.—Now engaged in crosscutting east on the 150 level; making good progress. Will cut the ledge a distance of 60 ft from the shaft. Everything looking exceedingly encouraging about the mine.

University.—Shaft down 82 ft, in a formation of porphyry and clay, mixed with quartz, which all assays well. The boiler has arrived and the other machinery will soon follow, when all will be put in position.

South Bulwer.—Still drifting and sinking on the 350 level on the ledge. In the face of the drift the ledge is looking well and is three ft wide of good milling ore. Winze No. 2 has attained a depth of 62 ft, and the ledge looks well in the bottom, being two and one-half ft wide of good ore. Still driving the west crosscut on the 420 level, and have made about nine ft during the week past. Formation encountered very favorable, showing small strata of good-looking quartz.

South Bodie.—*Chronicle*, Aug. 23: The company's ground is on Silver hill, Bodie district, south of the Mono mining company's ground, and north of the north Noonday, and covers an area of 600 ft by 1,500 ft. The shaft is situated at a point on the lode line 500 ft south of the northern boundary. Work was commenced on the 25th of August, 1878, by sinking and retimbering the old Hancock shaft 40 ft deep, and crosscut 75 ft east from the bottom. The crosscut was run in a formation of decomposed porphyry, clay and quartz, which had the appearance of a good, strong vein, the ore of which gave good results, both in gold and silver. The main double compartment shaft has been sunk to the depth of 520 ft, and a crosscut run east 507 ft. The face of the drift is at present in a hard bar of country rock, the footwall of regular porphyry. When this has been passed through it is expected to intersect the veins passing through Silver hill, from the Mono to the Noonday.

Dunderberg.—Bodie *News*, Aug. 22: This old mine is situated 18 miles west of Bodie on the east slope of Castle peak, the ledge has massive croppings, and is opened by a cross tunnel 600 ft in length, cutting the vein 200 ft deep. Drifts have been run 300 ft on the vein, which is from 2 to 5 ft wide, exposing fine ore everywhere. The character of the ore and of the country rock is different from that of Bodie, and likewise from the great mines of the western slope. Metallurgical difficulties, which may now be easily overcome, have retarded the development of this valuable property.

NEVADA.

Items.—*Foothill Tidings*, Aug. 23: About 75 men are employed drifting in the various claims at Lowell Hill, and about $5,000 paid for labor monthly. A fine ledge of gold-bearing quartz has been struck in the Surprise Con. mine, near Allison ranch. The new machinery of the Iron Clad quartz mine, near Rough and Ready, is about starting up steam. A rich strike in quartz is rumored to have been made in the neighborhood of Chapman's ranch, above Nevada City. A clean-up of tribute rock, amounting to $1,100, was made from Alaska rock on Wednesday. The tributers realized $5 per day to the man. There have been filed with the Secretary of State articles of incorporation of the Original Empire mill and mining company, to mine in Nevada county. Principal place of business, San Francisco. Capital stock, $5,000,000, divided into 50,000 shares of $100 each. Directors—Robt. Sherwood, J. B. Fargo, Delos Lake, Cameron Alexander and W. B. Brown, all of San Francisco.

Rocky Bar Mine.—*Transcript*, Aug. 21: The ledge in the stopes at the Chavanne shaft is of good size, and produces an excellent quality of rock. The same may be said of the ledge in the new shaft, from which the largest part of the rock from the mine is taken. The quartz yields quite evenly, always leaving a fair margin of profit to the company.

Deer Creek.—A number of veteran miners have since last winter commenced prospecting for quartz along the banks of Deer creek east of Nevada City. Two or three of them are making considerable money, and others are developing ledges just found that promise to pay uncommonly well.

Gold Tunnel.—The newly-developed mine in the old Gold Tunnel claim improves in size and richness. The new strike appears to be another vein in the series that comprise what is believed to be a true fissure.

Washington Mine.—Grass Valley *Union*, Aug. 26: The machinery and shaft are completed, and lateral drifts are about to be run. A large and well-defined ledge has been uncovered in the north drift.

Oriental Mine.—*Transcript*, Aug. 23: Twelve shaft men and an underground foreman were sent up to the Oriental mine yesterday morning. Thirty more will be put to work next week. The main shaft, which is now 470 ft deep, will be sunk still further, and the east and west drifts on the 450 level will be pushed ahead rapidly.

PLUMAS.

"National Mine."—*National*, Aug. 23: The mill of this mine is to be enlarged to 60 stamps. Recent developments has shown plenty of quartz in sight to feed double that number.

SIERRA.

Items.—*Messenger*, Aug. 23: The Black Jack quartz claim, at Jim Crow canyon, 8 miles east of Forest City, is being prospected with a view to put up a mill. The Black Jack ledge is between 2½ and 3 ft thick, and the rock taken from it while prospecting recently is said to be rich. The tunnel in the Savage mine is being put in at the rate of about 3 ft in 24 hours, through rock almost as hard as cast iron.

NEVADA.

WASHOE DISTRICT.

North Bonanza and Flowery.—Gold Hill *News*, Aug. 27: The drift north on the 300 level, and just inside the ledge, is moving regularly forward and disclosing some fine-looking quartz giving fair assays. From a point in this drift 350 ft north of the shaft a crosscut has been started west, which is moving slowly forward and showing some good ore. Another crosscut was started last evening from a point in this drift 75 ft north of that mentioned above. The crosscut on this level in Flowery ground has been temporarily delayed by putting in the turn-tables for the two lateral drifts running north and south from it. On the 400 level the lateral drift north is being swung around into the ledge for a crosscut, but has not yet reached the vein. The flow of water struck last week in the bottom of the shaft is still strong and prevents sinking. It is kept down, however, by the pumps and a little help from the giraffe.

Con. Virginia.—The north drift on the 1050 level is making four ft per day through favorable-looking vein matter carrying bunches of ore; total length, 112 ft. The crosscut east, 2150 level, is averaging three ft per day through vein material containing streaks of quartz; total length, 152 ft.

Lady Bryan.—The north and south drifts on the 750 level continue in favorable vein matter, and preparations to raise the incline from this level to the 600 level are now completed. The west drift from the south drift on the 600 level is in a soft vein formation carrying low-grade quartz and seams of fair grade. The north drift on this level continues in quartz of low grade. The east crosscut from this drift is in quartz and porphyry carrying some metal and looking well.

Mt. Hood & Vancouver.—The drift on the 1400 level is now in 460 ft, the face in good working ground. The ventilation in the drift has been greatly improved by placing in it a partition, allowing the fresh air to go in on one side and out on the other.

Ophir.—The station set at the 2400 level of the incline has been put in place and the incline continued six ft below it. When depth sufficient for a sump has been attained, the station will be opened and crosscuts run into the ledge. The material is promising. The north drift, 2300 level, is averaging four ft per day; total length, 189 ft. The face is still in vein matter carrying streaks of clay and some water. Two ft per day are being added to the depth of the joint Mexican winze from the 2100 level; total depth, 70 ft. The porphyry encountered contains considerable water, which hinders the work. The west crosscut from the north drift has been discontinued in order to push the drift itself along to explore the Hardy vein in that direction. The joint Mexican crosscut, 2000 level, is averaging three ft per day, and is now in 72 ft, and in porphyry. The main north drift has been enlarged and retimbered and made a thoroughfare for the mine. The ore breasts yield as usual and preserve their usual appearance.

Justice.—The lateral drifts along the west ore chamber and running both north and south are in exceedingly promising ground containing spots of nice ore. The drift south on the 1650 level from the Alta is making good progress through favorable-looking ground.

Sutro Tunnel.—The north lateral drift is being pushed ahead rapidly, and better progress is being made in that running south. A prospecting drift has been started in a vein of ledge matter cut through at a point 12,000 ft from the entrance and some fair assays have been obtained. The drift is supposed to be the Occidental ledge.

Golden Standard.—Encouraging prospects are still being met with in the Standard tunnel, the face showing quartz bowlders of a very promising character; 90 ft yet remaining to be made to connect with the Homestead shaft.

Caledonia.—The winze from the 1600 level is nearing the 1900 level; total depth, 290 ft. The bottom is in bird's-eye porphyry, containing some water. The Forman shaft has passed the 800 level and is being continued on down. The flow of water into the shaft continues strong and the rock hard.

Yellow Jacket.—Work in the mine is confined to sinking the incline winze from the 2500 level to the 2700. The winze is now down 245 ft on the slope below the former level, and making good progress. The work of sinking a sump for the shaft below the 2700 level has been commenced.

Gould & Curry.—The joint east crosscut, 1700 level, is averaging four ft per day; total length, 1,160 ft. The joint shaft has, during the past week, passed the 700 level.

Alta.—The rock encountered of late has been a harder formation of quartzite, carrying considerable water, the flow amounting to 140,000 gallons per day, which is, however, readily handled. A drift has been started from the bottom of the shaft on the 1550 level and is being pushed west toward the ledge. It will have something like 200 ft to run to get to the vein. The raise in the ore body from the 1550 toward the 1450 is continued.

California.—After having been driven 580 ft west from the shaft, the joint crosscut on the 850 level has been discontinued and a drift commenced north from a point 53 ft from the face; total length of this drift, 15 ft. On the 2150 level the north drift leading to the Ophir is still being cut down. The work of dismantling the C. & C. shaft of pump rods down from the surface is going on, preparatory to replacing them with new 14 by 14 sticks to drive the double column of 12-inch plungers below. The work of changing the system will take about a week yet.

Savage.—The water stood this morning between 125 and 130 ft on the slope below the 2100 level. The work of enlarging and retimbering the south winze is making good progress; total depth, 76 ft. Bulkheading the crosscut from the station, 2100 level, 200 and odd ft east, in hard blasting ground, and making a reservoir, so that the water can be pumped from the 2200 station up to that tank and thence to the 2000. This will be done with No. 8 or 9 donkeys, and thus the force brought to bear on the water will be doubled.

Union Con.—The joint Mexican crosscut west, 2000 level, is in a soft vein formation, carrying clay and quartz in streaks; total length, 60 ft. The joint Mexican winze is down 30 ft in porphyry carrying considerable water.

Mexican.—The joint Ophir winze from the 2100 level is down 70 ft and in porphyry carrying considerable water, which interferes with the sinking. The joint Ophir crosscut, 2000 level, is in vein porphyry, its face 72 ft from the lateral drift. The joint Union crosscut is averaging four ft per day; total length, 60 ft, the face in a soft vein formation carrying clay and quartz in streaks. The joint Union winze is down 30 ft, the bottom in porphyry carrying considerable water.

ARGENTA DISTRICT.

Items.—Tybo *Sun*, Aug. 23: A valuable discovery of ore in the Oliver Twist mine has been made. The Sedan is down 60 ft, with a good ledge in the bottom of the shaft.

BELMONT DISTRICT.

Items.—*Courier*, Aug. 23: Raise from 200 south level was advanced 16 ft through a small streak of high-grade ore. The stope south of raise is looking fine and yielding two tons of $100-ore per day. Raise No. 4 was advanced 36 ft during the past week through a vein of quartz two ft thick showing little bunches of nice ore. A drift south from No. 3 raise under the ore body has been started and advanced 18 ft. Work has been resumed in the south drift of the Gila. The vein still holds its width (about four and one-half ft), all of which is good ore, and a part of it very rich. The stopes are all looking well and turning out a large quantity of ore, which is being hauled to the mill at the rate of about nine and one-half tons per day.

BRISTOL DISTRICT.

Hillside Mine.—Tybo *Sun*, Aug. 23: The discovery of a very large body of high-grade lead and silver ore has been made in the west drift on the 400 level.

CENTRAL DISTRICT.

Surprise Mine.—*Silver State*, Aug. 22: The mine is opened by shaft to a depth of 100 ft, and there is said to be considerable good ore in sight.

CHIMNEY CREEK DISTRICT.

Item.—Winnemucca *Silver State*, Aug. 25: Reports reach town of several very rich strikes having been made recently in Chimney Creek district. The Henry Clay, a new discovery in that district, owned by Messrs. S. B. Palmer, Hsb. Luther, and others, is said to be a rich claim. This district is situated between two high mountains, with wood, water and grass in abundance, easy of access, making it one of the most attractive and convenient in the county.

COMO DISTRICT.

Items.—Reno *Gazette*, Aug. 16: The Como mines are reported as looking well. There are about 50 miners there now. The Eureka had 50 tons of rock crushed at Dayton, which went $17.75 per ton. The ore carries both gold and silver, and is free milling.

ESMERALDA DISTRICT.

Del Monte.—Esmeralda *Herald*, Aug. 23: Work is still progressing at and around the mine. The immense gallows-frame was placed in position yesterday. The turn in the drain tunnel was completed on Thursday and now only 25 ft remain to be run before connection is made with the main shaft. The work of getting the big spur wheel into place has been slow, but is finally accomplished.

EUREKA DISTRICT.

Items.—*Sentinel*, Aug. 22: In the shaft of the Wales Con. there is some very good ore. The general appearance of all the mines in this district is improving.

FLOWERY DISTRICT.

Brophy Mine.—Gold Hill *News*, Aug. 23: At the Brophy mine, Flowery district, the tunnel, at its face, is cutting ground from the seams in which issue strong currents of foul air and gases. These gases are not only foul-smelling, but also quite pungent. Streaks of quartz and pay ore are also coming in, and from all these indications it is thought that the main ore body cannot be far away.

PARADISE DISTRICT.

Items.—*Reporter*, Aug. 23: Preparations for the laying of a railroad track are being made in the lower tunnel of the Big Prize. The Big Nick mine is looking well, and yielding some good ore. At the Paradise company's mine a number of carpenters and graders are at work putting up a new ore house below their lower tunnel, through which all the ore will pass in the future. The ore now in the face of the drifts, shafts, etc., is as good, if not better than any yet extracted from this mine. Foreman Boyle now has 50 men at work in and around the mine, and expects to be able to break out 40 tons of ore per day, if required.

PIOCHE DISTRICT.

Mayflower Mine.—Pioche *Record*, Aug. 23: A new and important development has been made in this mine. In sinking the winze below the 130 level, at a depth of 70 ft from this level, soft ore was encountered, assaying $135 per ton. The extent of this body of ore is at present unknown. At this point the ore body is the full width of the winze—about four ft—and from all appearances much wider.

SIERRA DISTRICT.

Items.—*Silver State*, Aug. 23: Several old mining claims in this district are about to be reworked. They are the Lang Syne at Dun Glen, the old Anderson at Unionville, and the Eagle at Spring Valley. The Lang Syne is yielding pay ore. In the Lucky Dog a large ledge carrying rich ore has been developed at a trifling expense.

ARIZONA.

Items.—Phœnix *Herald*, Aug. 20: Parties have struck a lead of decomposed rock which carries a large amount of free gold, and if it holds out their fondest hopes will be realized. A specimen that weighed an ounce and a quarter yielded 75 cents in gold. The Chamberlain mine, two miles east of Globe City, is developing finely and bids fair to be one of the best mines of the district. The 60 level is still in ore which assays from $40 into the thousands, and all is free-milling ore. The crosscut on same level shows ore nine ft wide. There is now on the dump 100 tons of milling ore. Work is steadily going on in Richmond basin. Every claim being worked shows rich ore. Native silver is extracted from the west shaft of the La Plata. Bilderback's claim, the Great Western, is producing fine chloride ore; their ledge is two ft and gradually increasing in width. Joe Brewster is striking chloride and sulphuret ore in the Last Chance, a claim he has lately opened. It runs up to the south line of the Mack Morris claim on the west end. The ores from the Davis mine, belonging to the Prescott mining company, have been found rich enough to ship to England for reduction, and the returns were so satisfactory to the owners that, after deducting the heavy expenses on the ore, for mining, transportation and milling, they had a large surplus of money on hand. The "E F" and Eastern Slope mines produce gold and yield largely. The Golden Chariot mine, Groom creek, is being opened by shafts, the deepest of which is now down about 40 ft. The ore at this depth is very rich in free gold. The Manhattan mine, Hassayampa district, is yielding rich gold rock. A shaft is being sunk on the west extension of the Richmond with a good prospect of striking rich ore.

Globe District.—*Silver Belt*, Aug. 22: The Gould & Curry mine, a recent location south of Pinal mountains, shows a two-ft vein, assaying $51 in gold and $3 in silver. In the Pioneer mines drifting from the shaft each way at a depth of 47 ft. The breasts are full of ore and is being mined with a view of having it reduced at the Isabella mill.

COLORADO.

Items.—*Prospector*, Aug. 15: The Diamond drill, at work on the Denver lode, at Silver Cliff, Custer county, yesterday struck four ft of native copper, the mineral seeming to be in nuggets. In the "Favorite" lode they have struck a large body of sand carbonates, as rich as they can be. In shaft No. 2 of the Lone Star mine, in the carbonate belt, a bed of carbonates of unknown depth and width, carrying from 50 to 200 ounces silver, was uncovered at 60 ft from surface, and the mineral is so easily worked that the output with one shift of men ranges from 8 to 10 tons daily. In the Little Nell the owners have found a deposit of carbonates 22 ft down, that mill 27½ ounces silver and run well in lead. The Bessie, Katy Didn't and Favorite have an apparently inexhaustible bed of carbonates that look well. In the Golden Gate the shaft is down 55 ft in the Gov. Pitkin lode, one mile north of Blue mountains. A shaft has been sunk to the depth of 25 ft, following a three-ft vein of quartz which, at the depth of 10 ft, showed 10 ounces silver and 21% copper, with a few dollars in gold. The Britannic tunnel, in Clear Creek county, is driven into the southern slope of Revenue mountain a distance of 1,025 ft. Fourteen lodes are intersected thus far, the majority of which are profitable fissure veins of gray and yellow copper ores with galena containing silver. The Little Olly Clinton and Eagle Bird, locations of Eagle River mines, show a bed of mineral-bearing material from 12 to 15 ft in thickness. An incline has been run upon these lodes some 25 ft, and from the breasts shafts have been sunk, giving the thickness of the deposits as above stated, and as yet no lime-bed rock has been reached. A rich strike of ruby silver has been made in one claim on this main contact from which assays were made in this city giving 1,743 ounces and 2,466 ounces to the ton.

Items.—*Fairplay Flume*, Aug. 14: Big Sacramento is coming to the front as a carbonate producer. The Tennessee lode is said to show a fine body of mineral of that character.

[Continued on Page 140.]

Magnetic Strains in Iron.

A. S. Kimball, Professor of Physics in the Worcester Free Institute of Industrial Science, gives an interesting paper to the August number of the *American Journal of Science*, the object of which is to describe certain experiments made by inducing a magnetic state in bars of soft iron subjected to varying degrees of mechanical stress. As the result, we always have changes either in the form or dimensions of the bar, similar to those produced by the mechanical stress previously applied, and therefore the term "magnetic strain" does not seem inappropriate. Some of the phenomena hereafter to be described have been observed by earlier investigators. These experiments have not been repeated with the expectation of detecting errors in their work, nor of attaining a higher degree of accuracy, but rather, to afford that valuable check which the reproduction of well settled phenomena, with a new disposition of apparatus, affords, both upon the accuracy of the instrument and the skill of the operator.

Effect of Magnetization upon the Tenacity of Iron.—The pieces of iron tested were pulled asunder by a Fairbanks testing machine of 53,000 pounds capacity. The machine consists: 1. Of a large platform scale; 2. of a powerful screw-straining apparatus, driven by a belt from a shaft having eight changes of speed (the motive power is a Corliss engine which runs with great regularity); 3. an automatic weighing attachment to the beam, by which it is kept constantly poised as the stress is applied to the test piece.

The delicacy of this adjustment was such, that when the testing proceeded at a suitable rate, the deflection of the beam from the zero point did not indicate a stress on the test piece differing more than two pounds from that shown by the position of the poise on the beam. The scale was "sensitive" to the addition of one ounce when the platform was loaded with 4,000 pounds; and on the removal of the small weight, the beam promptly returned to its normal position. The course of experiment was as follows: Several pieces of the same kind of iron, made as nearly as possible uniform in size, were broken in the machine. The alternate ones, in the order in which they were cut from the bar, were magnetized to saturation by a helix, through which a constant current was passing during the experiment. The heating effects of the helix were slight, and probably without influence. The tabulated results were then compared, and from them the following conclusion was reached: A soft iron bar has its tenacity increased about nine-tenths of one per cent. by magnetizing it to saturation.

Another series of experiments upon telegraph wire gave 8.9 pounds difference between the means. Seventeen pieces of wire were broken. A series of 10 wires, one-quarter of an inch in diameter, gave an average of unmagnetized pieces, 4,532 pounds; of magnetized specimens, 4,572 pounds; difference, 40 pounds.

Some hundreds of pieces were broken with the same results. A magnetized piece always proving stronger than the unmagnetized pieces taken from the coil or bar on either side of it. A few apparent exceptions to this rule showed flaws in the tested pieces on close examination. The average increase of strength in these experiments is very near nine-tenths of one per cent. In every case the strength of the unmagnetized pieces was much more uniform than that of the magnetized. In the "Philosophical Transactions of the Royal Society," 1874, page 571, Sir William Thomson predicts this result as a deduction from Mr. Gore's experiments on electro-torsion.

Effect of Magnetization upon the Flexure of a Soft Iron Bar.—Joule's experiments upon the changes in dimensions of an iron bar when magnetized, formed the starting point for this part of the experimental examination in question. He has shown: 1. That if an iron rod be compressed longitudinally, it will be slightly elongated upon being made a magnet by a surrounding helix. 2. That the amount of compression does not affect the magnetic extension so long as the magnetizing force remains the same. 3. That the same phenomena, in kind and amount, occur in a bar which is neither compressed nor stretched. 4. If the bar be subjected to tension, the elongation, on making it a temporary magnet, is diminished, and as the tensile stress increases, the magnetic elongation diminishes through zero and becomes a shortening. 5. Prof. Mayer has shown that, in the case of an unstrained bar, the first passage of the current elongates the bar more than any subsequent passage of the same current, and that the second, third, and all subsequent elongations of the bar by a constant magnetizing force, are equal to each other; also that the shortening of the bar upon breaking the current is constant and equal to the second elongation. These facts, taken in connection with the common theory of flexure, fairly indicate one or two phenomena which will be found to attend the induction of a temporary magnetic state in a bar strained transversely. We see, from what has been said, that the neutral axis, and all the fibers on the concave side of the bar which have been shortened by compression, will be elongated by the action of the magnetizing force, while the fibers of the bar on the convex side, which have been subjected to tensional strain, will either be elongated by a less amount or will be shortened. As the result of this action we may be tolerably sure that the bar will be straightened. It is much safer, however, in this case, to proceed with our investigation experimentally, since neither the theory of magnetic action in iron, nor that of transverse elasticity, can be said to have been fully developed.

The apparatus used in this part of the investigation was simple. A very rigid iron casting, with supports for a micrometer screw, and the ends of the iron rod to be examined upon its upper side, was placed upon the platform of a Fairbanks scale. The iron rod, carefully freed from magnetism and enclosed in its helix, was adjusted upon its supports so that the point of the micrometer screw was just below its middle. The helix was made in two parts for convenience in loading the bar. The middle of the bar supported one corner of a triangular platform, whose sides were four, eight and nine feet. The other corners of this platform were supported upon points. This disposition of apparatus proved very satisfactory. The load upon the bar was easily and accurately determined by the scales, while the stability of the triangular platform permitted the addition or removal of weight without seriously disturbing the adjustment of the bar. The micrometer screw had 60 threads to the inch, and its head was graduated to 300 parts. The unit of measurement is therefore 1-18000 of an inch. At first, contacts of the screw with the bar was determined by an electric bell, but the probable error of setting the screw being greater than one division of the screw head, a more exact method was sought. The following device was finally hit upon, which gave results which may be trusted to one-half divisions. The iron bar, micrometer screw, and a telephone were put in the circuit of a very weak Leclanche cell. When the screw was turned up to loose contact with the bar, the familiar boiling sound of a too sensitive microphone was heard, which ceased the instant firm contact was made. The change from the loud boiling sound to silence was abrupt and sharply defined. In the writer's experience this is by far the most reliable method of determining the contact of a screw.

Agricultural Machinery at the Mechanics' Fair.

The exhibit of agricultural machinery at this year's Mechanics' fair is in some respects better than it has been for several years. It is true that we miss some of those who have been prominent exhibitors at former fairs, and whose goods we would like to have seen this year, but there was increased effort on the part of others, and the space is all occupied. We are disposed to call this year's display better than usual, because the machines are not shown as "lay figures," but are rattling, rolling, thrumming and roaring away, performing mimic duties with all the precision and fullness with which they do actual work in the field, the grain barn or the warehouse. This, of course, gives life and interest to the agricultural department; it makes a noise in the fair world, and people stop to look at it.

This change in the character of the exhibit is due to the enterprise of Marcus C. Hawley & Co., for they have in their space one of H. W. Rice's strawburning engines which, taking its steam from the main boiler, turns all the machines shown by the firm. This engine of Mr. Rice's is a piece of agricultural mechanism to be proud of. It embodies all his latest improvements, and it is finished in a style which justifies us in saying that it is the handsomest agricultural engine we ever saw. The boiler is neatly lagged with colored woods, the iron work tastefully painted and adorned; the brass well polished, and the machine in every way a model of good workmanship. We have spoken mainly of the finish, because the efficiency of the engine for the uses contemplated has been frequently remarked. The engine was belted directly to a large Gold Medal separator, which was running very smoothly. By means of counter shafts the engine was turning the geared parts of a large header, a barley feed grinder, and a power cornsheller of Adams' self-feeding pattern. M. C. Hawley & Co.'s exhibit also included a champion fanning mill, Buckeye mowers, and a large assortment of plows. There was also within the enclosure handsome specimens of R. I. Knapp's side-hill plow, made at Half-Moon Bay, San Mateo county, and of which we had good accounts last fall from those who had used it. It is certainly worth the examination of hillside farmers. It is also well adapted for use as a reversible plow on flat land.

Another firm making a varied and excellent display of agricultural implements is Frank Bros., of this city. Their exhibit is well arranged, and includes many standard and new devices. The most striking feature of the display is a Walter A. Wood's self-binding reaper in full rig, which all those who do not have opportunity to see it in the field should certainly examine with care. This is one of the latest triumphs in harvesting machinery, and is already one of the most famous. Frank Bros. have also a full line of plows, including the Browne gang, and the Browne sulky, and single plows handsomely made and adapted to different requirements. They also show the McSherry grain drill, the La Belle wagon, a hand cider mill, feed cutter, etc. We noticed also the Defiance cultivator, evidently a powerful implement and adjustable to a variety of cultures. The exhibit in general is a very creditable one.

David N. Hawley, another of our well-known implement dealers, makes a display of several popular implements, including the Newton wagon, Meyers' excelsior gang plow, meadow king mower, Archimedean lawn mower, etc. He gives considerable space to an exhibit of scales adapted to all uses, beautifully finished, and so far as we could test them, very accurately adjusted.

A novel device, which will attract much attention, is the fruit picker of L. H. Titus, of San Gabriel, Los Angeles county. It consists of a ladder mounted upon a light truck, and beside it is a large circular hopper of canvas, into which the fruit falls, and rolls into a basket below. It seems well calculated to aid in quick work, and to preserve the fruit from injury.

Another California made implement is Dalton's gang plow, made at the Pacheco foundry, in Contra Costa county. It is well finished, and seems to be well designed for effective work. Many of our local shops are doing good work in plowmaking, and the Pacheco foundry is evidently one of them.

The windmill features of the fair are maintained by the Iron Turbine wind engine, introduced to this State this summer by D. E. Goldsmith, of 419 Sansome street. It has already commended itself to many of our wind-power users, both for its mechanical principles and material employed in its construction, and bids fair to become a popular machine.

There is a good show made of harrows of California manufacture. Gas-pipe harrows, folding and otherwise, are shown in good variety, but without the exhibitor's name attached. Another California harrow is named the "Farmer's Friend" or "Channel Iron Harrow," patented by N. Beauregard, and shown by the agents of J. Smith and R. Hoppe, of 318 Pine St., S. F. It is made in three independent sections, with 24 steel teeth to each section. Thus it adapts itself to inequalities in the surface. The leading points of the harrow are the style of the tooth and its manner of fastening to the bar. As the tooth is grooved or channeled on two sides, it is lighter than the solid tooth and yet strong, and by its shape it keeps itself sharp. Each tooth is held to the bar by an iron strap tightened by threads and nuts. Thus it cannot work loose, but can be loosened and lowered easily when the point wears up. These features are novel, and seem worthy of examination.

Messrs. Hendry & Lennon show an object of peculiar interest in the shape of the first iron casting ever made in this State. It was made in 1850 to replace a broken part on one of the argonautic ships, and if it be viewed in connection with some of the massive casting now turned out from our foundries, one can get a good idea of the progress made in iron founding during the short industrial life of our State. Messrs. Hendry & Lennon also make a show of iron wheelbarrows which is interesting.

Adjoining the agricultural implement department, Mr. James, of Visalia, shows some of the mechanical appliances of his one-track railway, which is now attracting much attention among those who are considering the construction of cheap railways. He seems to secure a very effective and simple application of power to the work of propulsion, and we trust the value of his devices will soon be demonstrated by the construction of a working one-track line.

Norvegium.—A new metal of the above name has been discovered in the nickel ores of the island Otero, near Krage, in Norway, by Tellef Dahll. The ore is calcined to remove sulphur and arsenic; it is then dissolved in acids and sulphureted hydrogen used as a precipitant. The precipitate, free from nickel, is washed and calcined. It is redissolved in *aqua regia* and precipitated by caustic potassa, avoiding an excess, in which the oxide of norvegium is soluble. The precipitation is not complete, a portion of the new metal remaining in solution. The precipitate, a hydrated oxide, is emerald green. It may be very readily reduced by fusing with charcoal in a crucible or by a current of hydrogen. The metal is white, to a certain degree malleable, as hard as copper and fusible at a dull red heat. Its specific gravity is 9.44. It is soluble with some difficulty in hydrochloric acid, and readily in nitric acid, the solution being blue, but changing to green when diluted with water. Assuming the oxide to be NgO, the equivalent of norvegium is 145.95. Its salts are precipitated by caustic potassa, by ammonia and carbonate of soda, the precipitate being green and giving blue solutions. Sulphureted hydrogen gives, even in very acid solutions, a brown precipitate insoluble in sulphide of ammonium. Before the blowpipe, in an oxidizing flame, borax gives a green glass which becomes blue on cooling.

New Electric Current Regulator.—M. Hospitalier, a French engineer, has invented a new apparatus, which is composed of a resistance bobbin, formed of insulated wire wound on in a single layer, and having each turn stripped of its insulating covering for about 0.4 of an inch at the same spot; a curved lever, controlled by an electro-magnet at one end and by an adjustable spring on the other. This lever moves forward or backward on the bare portion of the bobbin if the current weakens or strengthens, until the resistance is adjusted by the decreased or increased number of turns in the circuit, and equilibrium is produced. The value of an apparatus of this kind for regulating the motion of dynamo-electric machines is great, as much of their utility depends upon steadiness of motion.

The Mineralogical Resources of New Zealand.

In the way of mineral wealth New Zealand is particularly rich, and promises ere many years have passed to compete in the markets of the world with her coal, steel and iron. The mining world was lately not a little startled by a statement that was circulated through the papers to the effect that the New Zealand government had asked for tenders for the supply of 100,000 tons of steel rails to be manufactured in New Zealand of colonial ores. There are vast resources of coal and iron in that country, and the only difficulty encountered in producing for such an order is the want of skilled labor. Dr. Hector, the Government geologist, reporting on these resources, says:—"Extensive deposits of ironstone are to be found in various parts of the colony, and especially would I notice one which I visited at Para Para, near Collingwood, Province of Nelson. I was surprised to find such a large amount of ironstone lying in such huge blocks upon the surface of the ground as I saw in that district. The out-crop of this deposit has already been traced over an area of from two to four square miles. The estimate I formed was that over 15,000,000 of tons of ore were visible upon the surface, without delving into the bowels of the earth at all. Practically, this area appears to be almost inexhaustible. From the analysis and smeltings which have been made both at Melbourne and Dunedin, this ore has been found to yield upon the average 50% of pure hæmatite iron." This Para Para ironstone field is only one of many such districts that remain to be opened out in New Zealand, and in close proximity to it are valuable coal seams, and also an unlimited supply of limestone, so that there appears to be every requisite for the manufacture of iron and steel. Before leaving the subject of iron, we may just briefly refer to another source of supply of the raw material, and, although it is not yet a commercial success, there appears to be every probability of that problem being solved at no very distant date. This is the huge deposits to be found on the seashores in certain districts closely amalgamated with the sand. The sea apparently sweeps over rich veins of ironstone, for each receding tide leaves behind it a large contribution to the already monster hillocks of sand and iron that have been piled up on the foreshores for ages past. The high specific gravity of this combination is strongly apparent when a handful is lifted and allowed to filter through the fingers, and an analysis has shown that the combination contains no less than 70% of metal. The smelting of this ore has not, however, been as yet a commercial success, but with such valuable deposits lying on the surface of the earth all over the district ready to the hand, little surprise need be experienced at the fact that very little has been done in the way of experiments in order to solve that problem and to give those seashore deposits a rich commercial value. As it is, the experiments that have been made have discovered that metal produced from this source is most excellent for the manufacture of edged tools and all kinds of whitework.

As to the coal deposits, there are seams from two feet up to no less than 54 feet in thickness, of coal of the best quality, and which can be used for all the purposes of manufacturing, steam, gas, and domestic uses, whilst the area appears to promise almost unlimited quantities. Thus, the Waingerri coal field is estimated at 16 square miles, whilst the Haitangota is estimated to contain 100,000,000 tons, and numbers of fields equally as extensive as these have not been opened out yet. Dr. Hector, reporting to the Government, says the Green Island coal field extends over 40 square miles, and is connected with one of the main lines of railway by a short tramway. It is worked on the room and rance system, the seams being from 16 to 19½ feet in thickness, and the coal a brown sort very useful for manufacturing purposes. He also states that the Small Buller coal field contains upwards of 100,000,000 tons, and the seam in this mine is 18 feet thick, of splendid coal, adapted either for manufacturing, steam, or domestic purposes. This Small Buller mine has been opened about four or five years, but has not been much worked yet on account of the scarcity of labor, and also the high rate of wages paid in the district. Coal also extends over a very wide area in Auckland province, and a report recently made concludes as follows: "Coal appears to have been scattered pretty plentifully throughout the colony, as I have met with it in Otago, Canterbury, Nelson, Westland, Auckland, and other parts of the colony. Besides these, the mineral products of New Zealand are gold, silver, copper, lead, mercury, plumbago and sulphur, the latter being found in very large quantities. As an experiment, some 50 capable workmen have just been selected in the mining districts of the mother country, and are about to be conveyed to the colony by the New Zealand government. A good supply of labor would undoubtedly secure the opening up of many of the rich coal and iron districts of the country, and with the Australian ports within five days' sail of New Zealand, and San Francisco, and the Indian, the Chinese and Japanese ports also within easy reach, there appears to be not the slightest doubt that a good market can be found for the produce.—*Colliery Guardian.*

The Engineer.

A Railroad Across Sahara.

To carry out the proposition of M. De Freycinet, the French Minster of Public Works, a commission of experts has been appointed to study and report upon the practicability of building a railroad through Sahara, between Algeria and Soudan.

Considering simply the length of road required, this project is at once seen to be prodigious in scope. Algeria's system of railway runs westerly from the capital through the northern part of the province in a direction generally parallel with the Mediterranean coast; it sends out no branch south of the Jebel-Tedla or Atlas mountain chain, so that the new route would practically require construction over nearly the whole distance between Algiers and Timbuctoo, which latter city is at the northern frontier of Soudan, on a tributary of the Jaliba or Niger. This distance, as the bird flies, is fully 14,000 miles. But it is also desired to connect Algeria by rail with the French colonial possessions at Senegal, on the Atlantic coast. Now, from Timbucton southwesterly to Senegal, in an air line, is upwards of 1,000 miles. The total shortest distance, therefore, would be about 2,500 miles. And since, after reaching Timbuctoo, it is almost certain that the railroad would either wind upward through the valley of the Niger, which is fertile, and has considerable population, or else would move southeasterly down that river before turning and striking off westerly to Senegal, it is clear enough that the road would be over 3,000 miles long. The estimated cost is about $100,000,000.

Improvement of the Harbor of Honfleur. The harbor of Honfleur consists of an outer harbor, or tide-harbor, having an area of close upon 10 acres, and of three tidal basins. The west basin has a surface of 107,640 feet, a length of 426 feet, with an average width of 256 feet. The quays, which are built of stone, have a united length of 4,986 feet. The entrance to this basin is 125 feet wide. The middle basin is hexagonal in shape, with an area of 43,020 feet; the surrounding quays measuring 1,312 feet in length. The entrance to this basin is nearly 40 feet wide. The east basin has a rectangular form, 975 feet by 234; its quays are 3,015 feet in length, and its entrance is 54 feet wide. The trade of the harbor of Honfleur, which is continually increasing, consists chiefly of the importation of timber from the north, pig-iron and coal, and of the exportation of agricultural produce for use in England. Now, including the quays of the outer harbor, Honfleur possesses only 7,218 feet of quays which vessels can come alongside of, and 38,063 square feet of wharfage available for the loading and unloading of merchandise. It is proposed to remedy this insufficiency of the existing arrangements by the construction of a fourth basin. The new basin will have a length of 1,312 feet, and its least width will be 196 feet. Its bottom will be on a level with that of the entrance to the east basin, with which it will communicate by means of an entrance having the same depth, and a width of 42 feet. The new basin will be effectually protected from the influence of silting up, by surrounding it with a dam raised from 7 inches to several feet above the level of the highest tides, and having a width at the top of 16 ft. This dam which will be connected by slopes to the adjoining ground, will facilitate the hauling alongside of vessels; its inner core will be constructed of earth dug from the excavation of the basin. The cost of the works is estimated at $100,000. One result of the construction of this new tidal basin would, it is anticipated, by providing sufficient wharfage in the harbor, lead to a considerable increase in the importation of timber from the north into the port of Honfleur.

Another Railway Bridge for Niagara River.—In 1849 the Lewiston Suspension Bridge Company and the Queenston Suspension Bridge Company were organized, the first on this side and the second on the Canada side of the Niagara river. They built a highway suspension bridge at Lewiston, and maintained it for some time. It blew over one day and was never repaired. The ruins of the structure still remain in the form of masonry on each side of the river, and one cable still suspended. The Oswego *Palladium* says that the Rome, Watertown and Ogdensburg and the Great Western (Canada) railway companies have bought the stock of the old companies above named and formed a company with $1,000,000 capital to build a bridge at Lewiston. The work will be begun immediately. The bridge will be one of the finest of the kind in the world. The river at the point to be crossed is 600 feet wide. The bridge will be a steel truss structure of one span, and will be a railroad and highway bridge. The object of the parties in interest is to accommodate the local trade of the Rome, Watertown and Ogdensburg road and that of northern New England and the West.

A commission of French manufacturers and engineers has been named by the Societe de l'Industrie Minerale, with the object of thoroughly studying and comparing the different processes for dephosphorizing iron, and of reporting on their respective merits and costs.

Useful Information.

Chemical Tests.

We here give a list of the substances used for chemical tests, called "reagents," most commonly used for ordinary purposes, and add to each a few lines in regard to their use.

1. *Distilled Water* (formula, H O).—In most cases pure rain water may be substituted. It is chiefly used for dissolving such solids as are soluble in water, in order to prepare them for the test.

2. *Ether* (formula, $C_4 H_5 O$).—Chiefly used for extracting fatty ingredients from a given compound. It is also used to detect and isolate bromine.

3. *Alcohol* (formula, $C_4 H_6 O_2$).—Used as a solvent for extracting certain substances not soluble in water. It will also precipitate substances which have been dissolved in water and are not soluble in alcohol.

Sulphuric Acid (formula, SO_3 HO).—Used as a solvent for many metallic substances, forming with them sulphates. Also a special test for barium, strontium and lead compounds, producing in these solutions a white precipitate.

5. *Nitric Acid* (formula, NO_5 HO).—A more general solvent for metals, except the noble ones, among which it only dissolves silver. It is also a powerful oxidizing agent.

6. *Hydrochloric Acid* (formula, HCl).—Also a solvent for many metals, and a special test for solutions of silver mercury, and lead, with which it produces a white precipitate. Its vapor forms a white chloride with ammoniacal gas.

7. *Nitro-Hydrochloric Acid (Aqua Regia.)*—The only acid that will dissolve gold and platinum, and decompose certain metallic sulphides.

8. *Oxalic Acid* (formula, $C_2 O_3$ HO).—Its solution a special test for lime. It produces a precipitate or at least milkiness in solutions of lime compounds.

9. *Tartaric Acid* (formula, $C_8 H_4 O_{10}$).—A special test for potash. It produces in potash solutions a crystalline formation of cream of tartar, and is used to prevent the precipitation of certain metallic oxides by alkalies.

10. *Baryta, Caustic, Nitrate, Acetic and Chloride.*—Special tests for sulphuric acid or sulphates, producing a white precipitate in their solutions. The caustic baryta produces a white precipitate in magnesia solutions.

11. *Potassa, Caustic* (K O) is used as a solvent of some and as a precipitant of other solutions; separates some oxides from others, and drives free ammonia out of all its salts, so that it can be detected by the smell.

12. *Carbonate of Potash* (KO, CO_2) is used as a precipitant, and for the decomposition of many insoluble salts, especially organic with metallic bases.

13. *Sulphate of Potash* (KO, SO_3) is used to precipitate baryta and strontia, if the use of free sulphuric acid is objectionable.

14. *Cyanide of Potassium* (KCy) is used to separate cobalt from nickel, and to reduce arsenic by heat, but mostly used as a flux for the blow-pipe.

15. *Phosphate of Soda* (2NaO, PO_5) is a test for alkaline earths in general, especially magnesia.

16. *Phosphate of Soda and Ammonia* (NaO, NH_4 O, PO_5, HO).—It is the most important blow-pipe reagent, as it fuses almost every chemical compound, hence its name of "microcosmic salt."

A Novel Gas Generator.—A novel arrangement for the manufacture of illuminating gas from gasoline is thus described: The reservoir for the gasoline is placed at a considerable elevation above the stationary burners on the walls. The gas, which is generated by simple evaporation, being heavier or having greater specific gravity than the atmosphere, is driven down by the latter through the orifice at the base of the reservoir, into the gas pipes, and conducted to the point where it is required for illumination. The gas may, it is said, be made at a cost not exceeding one-half the cost of coal gas. While the invention has some merit, it also has some drawbacks which cannot be easily overcome. In order to insure its successful operation it must be located in a warm room, else evaporation will not go on rapid enough to supply the gas needed to support combustion.

Bismuth Crystals.—Crystals from bismuth may be obtained by melting two to four pounds of the metal in a hemispherical iron ladle, allowing it to cool slowly until a crust is formed on the surface, then breaking this with a wire and pouring out quickly the still fluid metal from within. This yields, if not always large crystals, at least faces, from which project the corners of numberless cubes. Fine large crystals, with beautiful stair-like arrangement, can be obtained only by making the bismuth chemically pure, which is a tedious operation.

Best Silkworm to Rear.—Dr. Wallace, an authority on silkworm culture, said at a recent meeting of the London Entomological Society, that he had experimented with nearly every kind of silkworm which had been introduced into Europe, and that he had come to the conclusion that the only one which would pay to cultivate in England, was the *Bombyx mori*. He claims that the product of *Bombyx mori* is a superior article to any other.

Gelatine.—Gelatine, it is said, has a peculiar action on gum; if gum be added to gelatine, and the mixture sensitized with ammoniacal potassium bichromate, the behavior of the latter substance is very little altered by the addition of the former. Its solubility in hot water is somewhat increased, and to obtain the same degree of insolubility for the image as with pure gelatine the exposure must be longer. But if the mixture be acidulated with acetic acid, the film after exposure and desiccation is less soluble than one consisting of chromated gelatine only with acetic acid. Gum, therefore, renders an acid solution of gelatine less soluble, and the reason for this is believed to be that glutine and arabic acid form a compound solid only with difficulty. Borax thickens a gelatine solution, and the alkaline reaction of the same substance tends to render the chromated gelatine more insoluble. Calcium nitrate gives to gum an enormous power of adhesiveness.

Railroad Earnings.—The gross earnings of all the railroads of the country for the last year were $490,103,361, against $472,909,272 for the preceding year. What is remarkable in looking over the figures which make up these totals is the large part contributed by the Western roads. On this point *Poor's Manual* (advance sheets) says: "The gross earnings of the railroads of the Western States were $209,852,275, against $193,204,516 for 1877; net earnings, $77,958,220, against $66,085,253 for 1877. The dividends paid amounted to $19,341,222, against $14,556,462 for 1877. The earnings from freight, mails, etc., were $160,856,795, and from passengers, $49,995,480.

Photographic Patterns.—One of the silk manufacturing firms of Lyons, France, are introducing the production of photograph impressions on stuffs. They sent to a recent meeting of the Photographic Society several pieces of silk with a variety of photographic pictures printed thereon, including, among others, a number of large medallions representing pictures of the old masters. The length of the specimens thus exhibited is stated as being no less than 131 feet. The process by which they are produced is not given, but it is believed, says the *Commercial Bulletin*, that the prints are made with salts of silver.

Nail Terms.—Many persons are puzzled to understand what the terms "fourpenny," "sixpenny," and "tenpenny" mean as applied to nails. "Fourpenny" means four pounds to the thousand nails, or "sixpenny" means six pounds to the thousand, and so on. It is an old English term, and meant at first "ten pound" nails (the thousand being understood), but the old English clipped it to "tenpun," and from that it degenerated until "penny" was substituted for "pounds." When a thousand nails weigh less than one pound they are called tacks, brads, etc., and are reckoned by ounces.

Resistance of Electric Arc.—According to the *Journal* of Franklin Institute, the relations existing between arc resistance and current strength and illuminating power, are, within a certain range of conditions, apparently expressed by the following laws: 1. In arcs of equal lengths the resistances are inversely proportional to the current strengths. 2. The illuminating power of an arc is approximately proportional to the current traversing it. 3. In arcs of equal length the total energy given out is proportional to the current strength.

Good Health.

Poisoning by Strychnine.

A recent case of poisoning by strychnine in San Francisco, where the patient was well and rational for a long time after the reception of the deadly drug, and conversed pleasantly with his physician, recalls a remedy which is said to be so well known and successful that where life remains the effect of the strychnine may be entirely obliterated and its deadly action destroyed. We allude to chloroform. The effect of strychnine on the system is to produce a contraction of the great nerve centers, or ganglia, and bring about paralysis. Aiming directly for these points, it reaches the brain and destroys its vitality by its enormous contractile power upon the system. In case of poisoning by so doing, the contraction is made manifest by the "twitching" of the muscles, the mouth is drawn in different shapes, and the patient then has generally been said to be so effectually under the influence of the drug that be cannot be saved. It is agreed, however, that there need never be a fatal case of poisoning by this death-producing element, and that as long as any signs of life remain a cure can be effected.

Chloroform is administered in sufficient quantities to keep the patient under its influence. This anesthetic attacks the nerve centers with the same vim as strychnine, but produces a contrary effect, in that it causes a relaxation, and fights the strychnine on its own ground. By allowing the patient to recover from the effect of the chloroform, the "twitchings" of the muscles will be resumed if the strychnine has not been effectually counteracted. In this case, chloroform must be applied again without delay, and kept up as long as the nervous or spasmodic contractions appear. The remarkable effect of the chloroform is apparent as soon as administered. The contractions and twitchings of the mouth, etc., immediately cease, and do not return as long as the patient is under its influence.

New Use for Cocoanut Milk.

Dr. George M. Sternberg, Secretary of the National Health Commission, now at Havana, says:

I find that the air of our laboratory is loaded by minute spherical organisms, and contains bacteria not distinguishable from *bacterium termo*. I have made some experiments for testing apparatus designed for the purpose of keeping putrible fluids germ-proof, using for my test the liquor from the interior of an unripe cocoanut. This liquor possesses properties which will, I believe, make it of great value. It is transparent as water when the nut is not too ripe, is contained in a germ-proof receptacle (the cocoanut), and when exposed to the air, bacteria and other organisms develop with astonishing rapidity. In my first experiment two portions from the same nut were placed in small beakers, one exposed to the air and the other protected by the glass cover and bell jar (Lister's apparatus), with previous precaution of heating apparatus to 320°. The following morning the portion exposed to the air was milky in appearance and loaded with bacteria large and small, and had upon its surface a pellicle containing the cells of some fungus; the portion under the bell jar was clear as water. I have succeeded in keeping this liquor in quantity for three days in a Florence flask, made germ-proof by heating to 320° Fah., and provided with a cotton germ filter. I have made several good negatives of bacteria developed in cocoanut liquor for the purpose of testing my lenses and apparatus. I propose to continue the experiments commenced during the ensuing week.

Activity, not Energy.—The *Christian Union* thus defines the difference between activity and energy, and suggests wherein a large class of industrious people lack that element which produces success. There are some men whose failure to succeed in life is a problem to others as well as to themselves. They are industrious, prudent, and economical; yet, after a long life of striving, old age finds them still poor. They complain of ill luck. They say that fate is always against them. But the fact is that they miscarry, because they have mistaken mere activity for energy. Confounding two things essentially different, they have supposed that if they were always busy they would be certain to be advancing their fortunes. They have forgotten that misdirected labor is but waste of activity. The person who would succeed is like a marksman firing at a target; if his shots miss the mark they are a waste of powder. So in the great game of life, what a man does must be made to count, or might almost as well have been left undone. Everybody knows some one in his circle of friends, who, though always active, has this want of energy. The distemper, if we may call it such, exhibits itself in various ways. In some cases the man has merely an executive capacity when he should have a directive one—in other language, he makes a capital clerk of himself when he ought to do the thinking of the business. In other cases, what is done is not done either at the right time or in the right way. Energy, correctly understood, is activity proportioned to the end.

Man's Occupations and Mortality.—The statistics of mortality in Massachusetts since 1843 teach some instructive lessons in regard to the influence of man's occupation on his chances of longevity. We extract a few data showing the average duration of life of various occupations: Gentlemen of leisure, 68 years; farmers, 66; judges, 64; light-house keepers, 63; female nurses, 62; basket makers, 61; pilots, 60; sextons, ship carpenters, bankers and clergymen, 59; professors of colleges, 57; lawyers, 56; physicians, 55; clock and watch makers, sheriffs and policemen, 53; wharfingers and butchers, 51; editors of political papers, 47; peddlers, 46; artists, 44; dress makers, 43; druggists and dentists, 42; musicians and music teachers, 41; saloon keepers, tobacconists, printers, railroad agents and conductors, 40; milliners, factory girls and domestics, 39; glass-blowers and powder-mill employees, 38; clerks and book-keepers, 36; plumbers and carvers, 35; female school teachers, 32; telegraph operators, 28; brakemen on railroads, 26.—*Manufacturer and Builder.*

Good News for Dyspeptics.—We have seen, says one of large experience, dyspeptics who suffered untold torments with almost every kind of food; no liquid could be taken without suffering; bread became a burning acid; meat and milk were solid liquid fires, and we have seen their torments pass away and their hunger relieved by living on the whites of eggs which had been boiled in bubbling water for 30 minutes. At the end of the week we have given the half yolk of the egg with the white, and upon this diet alone, without fluid of any kind, we have seen them begin to gain flesh and strength, and quiet, refreshing sleep. After weeks of this treatment they have been able, with care, to begin other food. And all this without taking medicine. Hard-boiled eggs are not half so bad as half-boiled ones, and 10 times as easy to digest as raw eggs, even in eggnog.

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The Americanized Arastra, Almarin B. Paul, S. F.
The Advertisement, L. Brinkman, San Quentin, Cal.

The Week.

From all parts of the country come the most encouraging reports concerning the mining prospects. The condition of California to-day, in regard to its precious metal supply, would seem not to be far behind its palmiest days, when gold was to be had for the picking up. Old claims have been rejuvenated, new and rich discoveries have been made, and the immense quantity of waste on the Bear and Yuba rivers promises to yield a large return by the aid of new processes for utilizing the waste. Mono county mines may be said to be a source of permanent wealth. A general prospecting for precious minerals seems to be inaugurated, and judging from the results already attained, the future is the most encouraging. Oregon has time outside of her agricultural and timber features to find precious minerals and wash out gold from gravel claims. The Boise basin in Idaho is turning out rich ore from its mines, and general activity prevails there. Washington Territory and Montana are also adding to the world's supply of bullion; while, if all accounts are true, Utah and Arizona are daily laying bare enormous wealth. The San Juan region of Colorado possesses mineral wealth which is being developed and made known by interesting accounts.

We are obliged to say that the general appearance of the mining business is better than that of the industrial arts. There has been some movement in machinery, but not sufficient to warrant us in comparing it with the activity displayed in mining researches. The Mechanics' fair now open in this city is filled with interesting and valuable exhibits of machinery and processes, which attract much attention and interest.

PERSONAL.—Publishers and others will learn something to their advantage by communicating with us before having any business transactions with C. Stephenson, lately connected with newspapers in Auburn, Elko, Omaha, Chicago, New York, etc.

Improved Mining Prospects.

There is reason to say that the element of encouragement predominates in the mining prospects of this slope. From reliable information, we are impressed with the idea that a period of healthy activity has opened upon our important interests, and that systematic prospecting has rewarded its fruits in the developments made in various quarters. Many old and partially abandoned claims have been re-prospected, and resulted in valuable discoveries that have justified the investment of capital. The old Crœsus mine in Placer county, now owned by Wm. Gwin, has developed a ledge of from three to seven feet in thickness, very rich in sulphurets. At Coulterville, in Mariposa county, a ledge about to be abandoned has by careful prospecting developed into a valuable ledge, rich in sulphurets. New capital is being put into the old claims of Inyo county, near Resting Springs, and rich ore is being taken out. Excellent quartz ledges have been struck in Sierra county, back of the Reese mine. The hydraulic mines have been paying satisfactorily, so far as the results can be obtained. Many of them have shut down to clean up and wait for winter rains, while others are still working advantageously in localities where a constant supply of water can be obtained; particularly several in Nevada county are making large returns of precious metals. At the Henrietta Gravel claim, above Orovilla in Butte Co., an increasing yield of coarse gold, for which this claim has been noted, has justified the putting in of a dredger and improved mechanical appliances.

The gravel mines of Tuolumne county are yielding their quota of precious metals, while in Sacramento county the old placer claims about Folsom are increasing their returns, having an abundance of water supplied by the Natoma Co. ditch.

A flume is being put in at Bear river, in Placer and Nevada counties, to work the tailings along that river, which have proved to be very valuable. The quantity of tailings here and up the Yuba river is immense, and new processes have enabled the utilization of what before was considered waste.

Beach mining, or working up the black sand along the sea coast, is increasing by reason of a new blanket sluice of peculiar form, which obviates the difficulties heretofore encountered in separating the gold from the sand. Considerable of this kind of mining is being done with profit all along the coast from Santa Barbara to the Oregon line.

Recent discoveries of gold and silver-bearing rock in Fresno county have directed attention to that quarter. The topography of the county is favorable, and good wagon roads are about to be constructed. With a rich soil and an inexhaustible supply of water, this county bids fair to become an important one in respect to precious metals and agriculture.

In Mono county the magnitude and extent of the mining interests have begun to be realized, and the preparations made to bring out the vast supply of precious minerals, indicate a brilliant and solid future for this county. Everywhere in California new and rich discoveries have been recently made, and improved processes have enabled capital to realize from the immense waste of former years.

We do not doubt that the resources of California are, to a certain extent, yet unknown and unprospected. The results of careful examination even in old localities that have been supposed to be worked out is very encouraging for the further prospecting in new regions outside of the beaten track. From the mountain tops to the sand washed up by the ocean on the beach, the precious metals are being taken out with profit. Surely in view of these facts, considered as they are, we are justified in saying, that the mining prospects of this State are flattering. And that so far from feeling discouraged, we have every reason to congratulate ourselves upon the arrival of a new era in our mining prospects, which is proving itself to be as progressive as are the mechanical appliances which have partially enabled this condition of things to be accomplished.

FINE SPECIMENS.—We have been shown by Mr. Thos. Mootry, Jr., some handsome and neat specimens of ore from the Gold Hill mine, on Granite creek, near Quartzburg, Boise county, Idaho. We gave a detailed description of the mine and works some time since, so it is not necessary to repeat it. It has been worked since 1863. The company now own some 7,000 feet of ground, and have a 25-stamp mill, four pans, two settlers, and five concentrators, with a 60 horse-power engine. The 200 square feet of plates in front of battines, are silvered by what is claimed to be a peculiar process, which enables them to catch the finest ore. They are now working through a 250-foot shaft, at the bottom of which its main level extends 600 feet each way. The ledge is stated by Mr. Mootry to be from 4 to 10 feet wide. It is decomposed and contains strata with pockets of specimen ore, such as has been shown to us. This is very rich and beautiful. The owners are T. Mootry, Jr., D. and W. A. Coughanour, the latter being Superintendent. On Canyon creek, three miles off, are the Belshazzar, Ebenezer, and Mountain Chief mines, all turning out good ore, which is crushed at the Gold Hill mill.

Rights of Stockholders.

The case of Erwin Davis, plaintiff and respondent, vs. the Flagstaff Silver Mining Co., (limited) *et al.*, defendants and appellants, recently decided in the Supreme Court of Utah by Associate Justice Boreman, has a wider application than is covered by the case at bar. Like other decisions of importance involving general principles, it would seem likely to be a precedent in cases of abuses of a similar nature. There can be no doubt that our courts are gradually raising their standard of adjudication to meet the requirements of equity, and the constitutional privileges accorded to every man in regard to his property, and right to be protected from whatever is detrimental to those rights.

It appears from Judge Boreman's decision that "The appellant, the Flagstaff company, was incorporated in England, to acquire, hold, and operate mining and smelting properties in Utah. The respondent sued the company, alleging the purchase of ores from it, and the non-delivery thereof; also, that he had advanced money to said company, and that contract was entered into by and between the company and himself, whereby to acquire a lien upon the properties of the said company in Utah; and he asked the enforcement of said contract, and that a receiver be appointed. The other defendants were made parties because they were supposed to hold liens against the property of the said company."

The court below appointed a receiver as prayed, and ordered the surrendering the property to the receiver, at the same time enjoining the parties from interfering with the receiver in his management of the mine. The judgment fixed the priority of the liens, and ordered the receiver to pay out thereon, and to respondent sums amounting to a total of nearly $290,000 and interest. This judgment and the order of the court overruling the motion of the company for a new trial was appealed from. It appears that the respondents, by arrangement with the directors of the said company, had loaned the company very large sums of money, which were to a great extent, if not entirely, used in paying dividends. Subsequently, the character of these loans was sought to be changed, and thus was created what are now offered as "ore contracts." And, thereafter, the alleged contract of December 13th, 1873, was entered into by said company, through its directors, and by said respondent in person. This alleged contract of December 13th, 1873, called exhibit "A," was based upon the ore contracts and directed their payment.

"It seems clear that there was no affirmative action of the stockholders ratifying or approving either the loans, the ore contracts, or the contract of December 13th, 1873. Whatever there was in their conduct supposed to bear such a construction was of a negative character. But, in such matters, a corporation must be judged by its acts, and not by its failures to act. It cannot be said to approve that which it simply failed to disapprove by express words.

"A corporation has no powers but such as are granted either in express terms or by direct and necessary implication. This company had no power granted to it to make loans of money, except under special limitations as designated in Section 20 of the 'Articles of Association' of said company. The loans were far in excess of the amounts authorized. The use of the money to pay dividends was in violation of the acts of Parliament, called the companies' acts. By these acts, this corporation is prohibited from declaring any dividends, 'except out of the *profits* arising from the business of the company.' Dividends paid out of borrowed money were not paid out of 'profits.'

"It could not be said that respondent was an innocent party and should not be held responsible for any exercise by the company of powers not granted or of powers prohibited. Actual knowledge of the want of authority in the company is not necessary to be shown. In dealing with the company as respondent did—in being a party to an executing contract—he must see to it that the company has the powers it claims to have. In the instance before us, we have no doubt that the respondent was fully aware of the corporate powers of the company. He was one of the incorporators of the company, and one of the first directors. He owned and bought and sold large amounts of its stocks. He was a stock broker and a manipulator of stocks. He went to London with letters that gave him 'a good position' (to use his own language), and he says that, 'in London, the way of operating is very different from here—decidedly old fogish. They did not understand bulls and bears on the stock exchange. A man would go a bear a thousand or two pounds there, and make as much disturbance about that as a man in America would a million.' It was right in the line of his business to know the general powers of these stock corporations. The large dividends from the borrowed money increased the market value of the stocks; the public supposing that the company was doing a legitimate business, and paying dividends out of 'profits,' and such people 'did not understand bulls and bears on the stock exchange.' A shrewd manipulator of stocks could afford to run the risk of losing money loaned to a company to be used to pay dividends, when he knew that he could receive it all back, and much more too, by the sudden rise in the price of stocks.

"The evidence shows that the directors at that time were acting in entire harmony with the respondent, and willing always to comply with his wishes. The respondent did not propose to close the money advanced, and hence the claims were put into the shape of 'ore contract.' A change of shape did not change the substance, however. Being based upon fraudulent and void loans, they were necessarily also fraudulent and void."

Dividends from "Anticipated Profits."

"But, let us assume that no loans ever were made, and the ore contracts were original, and based upon prior transactions between the parties. The receipt of forward payment for ores to be delivered in future, as specified in these contracts, was beyond the powers of the corporation. The company has no grant of authority to thus bulk its expected productions, and involve the company to its ruin by subsequent inability to comply with the terms of the contract. Money arising from such forward payments for ores could not legally be used to pay dividends. Such money was not 'profit arising from the business of the company.' The money might be termed anticipated profits, but we nowhere find any authority for the company declaring dividends out of any profits; except such as are realized out of the business—'arising out of the business, of the company.' And it is against public policy to allow corporations to thus deal so as to deceive and defraud the people. An unscrupulous directory or company might have no ores, and yet sell ores for 10, 20 or more years ahead of the production thereof, and use the money thus acquired in declaring one or two dividends of enormous size. Those knowing the inside workings of the company could sell off all their stocks at enormous profits, and leave the company bankrupted, and in the hands of those who were deceived and defrauded into buying the stocks. Courts cannot look with any favor upon claims for such powers in corporations.

"We, for the reasons stated, do not think that respondent has a claim upon the company for the enforcement of this contract, Exhibit 'A,' sued upon, nor is he entitled to damages for its breach or non-fulfillment.

"The main feature of the judgment in this case is that of appointing a receiver. Everything else in it is made subservient to this one matter—is secondary to it.

"The judgment in this case is for the appointment of a receiver, and for nothing else except that which is incidental thereto. He is appointed, and directed to carry into execution a certain contract. As that cannot be done according to the terms of the contract, he is directed to pay money instead of ores. The defendants are enjoined from interfering with the receiver, and required to deliver certain property to him. The judgment, being solely for the appointment of a receiver and for matters incidental thereto, and not being made in compliance with either provisions of the statute, was improper.

"The judgment and order of the court below is reversed with costs, and the cause is dismissed.

"Schaeffer, C. J., dissents."

Mono County Mines.

[Written for the PRESS by J. W. A. Wright].

Lake District, Mammoth and Pine Cities.

The wanderings of your correspondent in these parts having taken him to the new mining districts of eastern Fresno, as already described, he concluded to make a short visit to the much talked of Mammoth mine of Mono county, and its adjoining ledges, as they were but five or six miles distant. I hope the facts and figures there learned may be of some interest and use to your readers:

These ledges comprise what is now known as

Lake District,

So called from the chain of five or more small lakes which form the sources of Owens river. No mining region on the Pacific coast is more favorably located for supplies of wood and water, or for the ready drainage of its mines to a great depth than is this new and extensive mineral belt; nor has any a more picturesque location in the midst of wild, grand, and varied mountain scenery. The extent of its mineral belt is about four miles long and a little less than a mile wide, so far as prospected.

When you reach the highest point in Pumicestone Gap, on the divide between Fresno and Mono counties, and at an altitude of 10,350 feet, this fine and extensive view is spread out before you. Immediately opposite and not more than a mile distant in a direct line, is Mineral hill, along the top and precipitous red and gray sides of which all the ledges of this district are found. Its highest point towers fully 1,000 feet or more above you. In the gorge at your feet, from 500 to 1,000 feet below you, are the clear, cold lakes and cascaded streams connecting them, which form the head waters of Owens river. Just east of the middle lakes and immediately under the western cliffs of Mineral hill, is Pine City, with its 30 frame and log buildings, between 9,800 and 10,000 feet above the sea, and a population of 100 or more. About a half a mile beyond and along the northern base of Mineral hill, in a narrow depression descending eastward between that and a large knoll, formed chiefly by the agency of ancient glaciers, is

Mammoth City.

Its 125 new frame houses extend for about a

quarter of a mile on both sides of Mammoth avenue, a street with good width of some 80 feet. Its permanent population is estimated at some 300 or 400, though this Spring there were said to be 1,000 or 1,500 people in and around town, most of whom were out prospecting in July. Its altitude at a central point is 9,700 feet. Immediately below Mammoth City, eastward, are the 20-stamp mill, the offices, stables, and lodging houses of the Mammoth mining company; also, the large store and express office of L. Wallerstein & Co., and the office of the Don Quixote mining company. Their altitude is about 9,500 feet. The mill is connected with the mine by a tramway over 3,500 feet long. About a mile northeast, and at several hundred feet less altitude, is Mineral park, where, since May last

McFarland and Fraser's Saw-Mill

Had cut up to July 650,000 feet of lumber, and their shingle mill had turned out 400,000 shingles. It is located in a dense forest of large-sized firs and yellow pines, with which all that region abounds. Higher up, even to altitudes of 11,000 feet, are heavy belts of tamarack, or as it is called in parts of Nevada, "hack-matack."

42 feet; the next longest is 36 feet. Then in succession, at irregular intervals, according to convenience in working, are cuts of 28, 18, and 23 feet. Mr. Cross has exposed here so large a mass of ore that he assured us he could take out daily, if necessary, 500 tons of ore, though they do not expect to crush more than 120 tons per day, when certain additions are made to the mill and its power. (3) Below this a third tunnel is finished 160 feet, some 200 feet more being required to reach the ledge. (4) A still lower tunnel is completed 560 feet, at least 240 feet more being necessary to strike the ledge. (5) At a point farther east another tunnel is projected, which, according to estimate, is to reach the ledge with a length of 2,000 feet, and at a depth below the higher outcroppings of 1,800 feet.

Originally, Mammoth was considered a silver mine, and its mill was rigged accordingly. Results prove that on an average only about 25% of its yield is silver. Consequently the company is now making

Important Changes and Additions

In its mill. Heretofore they have relied on water-power alone, using Knight's hurdy-gurdy wheel. But this giving only 65 horse-

finished, as they are expected to be in September. Part of the large ledge is certainly low grade ore averaging $20 or less. Mr. Cross gave me the following as a fair example of the yield of some of their good ore. Amount reduced 44 tons. Yield from the pulp $53 per ton. He cleaned up the mortars, and got a bar of bullion 180 ounces at $13 per ounce. But while the Mammoth is the only mine in the Lake district in which regular work is going on, except as prospecting, and is the one that has given reputation to the district, it is

Not the First Discovered Nor the Only Ledge

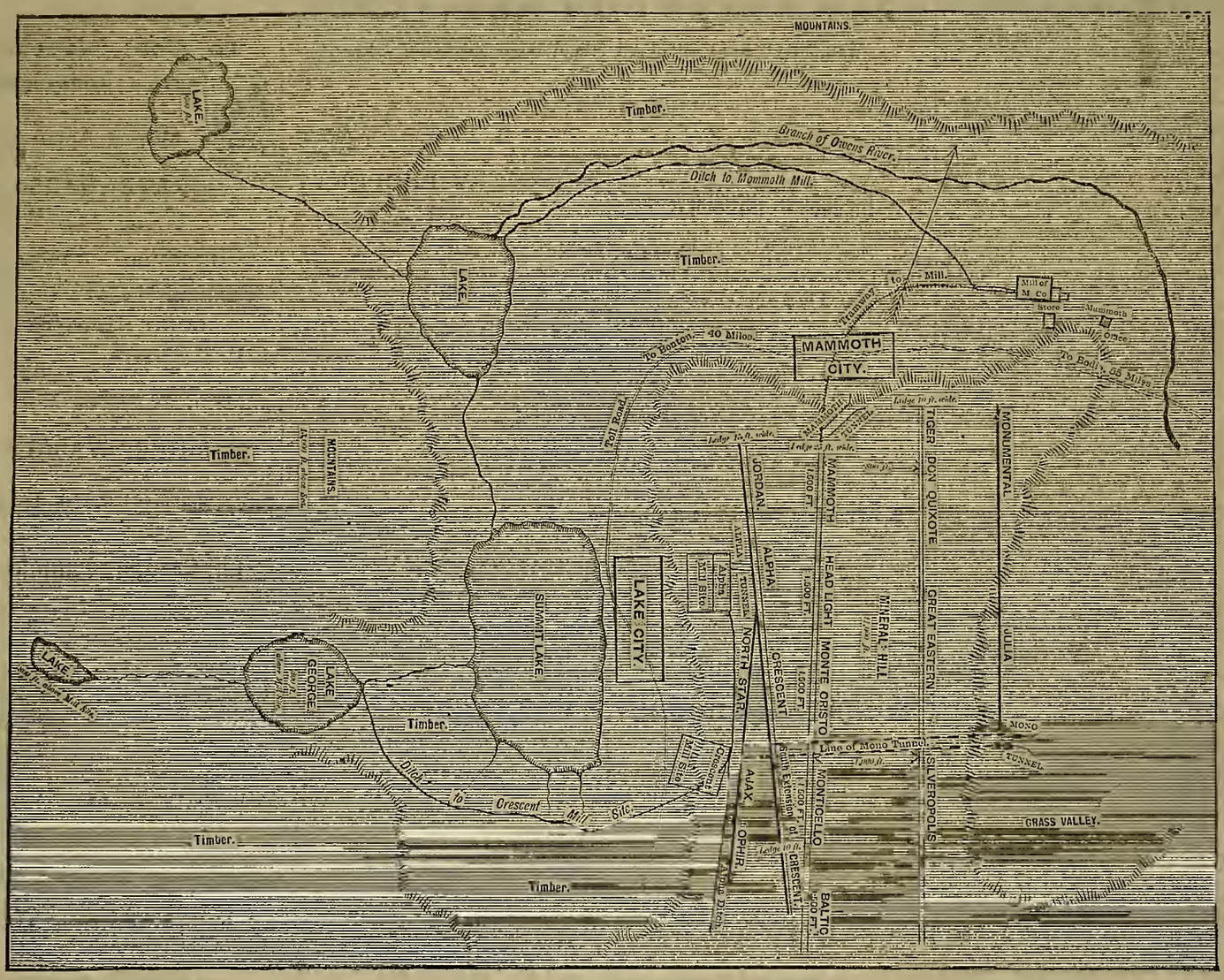
There. The first ledge discovered there was the Alpha near Pine City. It was located June 19th, 1877, by Messrs. Lowe, Parker, Smith and Martin. A tunnel 185 feet has been run into it, having struck some small ledges, one 12 feet wide, but has not yet reached the main ledge, which is supposed to be 30 feet further. Its assays are reported to have ranged from $4 to $852.69, half gold, half silver. Next the northern extension of this, called the Jordan was located. In it a shaft has been sunk 15 feet. The third location was the south extension of Alpha, known as the North Star. It is in the main correct. Merely observe that Lake City is now called Pine City, and ledges not there named can be located by the above description.

We shall close this letter with some account of

The Work Done and Assays

In some of these claims. A. Caldwell, Superintendent of the True Blue, informs me that their prospecting shaft is down 36 feet, that an assay shows $15 free gold, and the deeper they go the ore improves. Vein over 14 feet wide. Tunnel in 20 feet from eastward projected to strike ledge 600 feet below surface. He informs me also, that a vein 500 feet eastward of said shaft in the company's ground, shows 25 feet of ore that will average $80, but has assayed as high as $553, chiefly silver. In Silveropolis shaft is down 12 feet; tunnel 35 feet in Crescent City, their prospects good as adjoining claims.

F. C. Farnham, Superintendent of the Monte Christo, informs me that they began work there last April. Their shaft is down 80 feet, and 75 feet of crosscuts have been made. Ledge averages 12 feet in width, good paying quartz; yield about 40% gold, which is free, the silver being sulphurets. In the Head Light, which



MAP OF LAKE DISTRICT, MONO COUNTY, CALIFORNIA.

The ledges and tunnels of

Mammoth Mine

are on the north face of Mineral hill, immediately above Mammoth City. Its principal stockholders and directors are as follows: Thos. Bell, President; Geo. W. Grayson, W. W. Traylor, Archie Borland, Sol Heydenfelt; and Secretary, A. W. Rose, Jr. Mr. James Cross, its careful and energetic superintendent, kindly gave your correspondent every facility for examining the mine and its works. He accompanied a party of us up the incline and through the main or middle tunnel, where most of the work was then going on. From him and from personal observations the following facts were learned: Four tunnels have already been begun, and a fifth is projected. (1) Along the outcroppings, at an altitude of about 10,500 feet, is the upper tunnel in 157 feet, but not now worked. (2) Below this some 250 feet is what is known as the middle tunnel. This was completed about 500 feet, with a lateral drift for 300 feet. From this tunnel and its various branches all the ore is now taken. Our party carefully prospected every portion of it. Though five long crosscuts were already made, the true width of this very extensive and uniform ledge is not yet known. The longest crosscut here is

power, and proving insufficient, they are now putting in a steam engine 24x48, or as large as that in the Consolidated Virginia, the largest size for milling purposes on this coast. They are also increasing their stamps to 40, adding an extra rock-breaker and a large air-compressor. A lathe also will be put up soon, and a cupola for casting necessary shoes and dies, and other fixtures. At great expense, strong dams have been made at the lakes to save water enough for all seasons. The long tramway from mine to mill is to be so changed that for the whole length the loaded cars can pull up the empty ones, and the entire structure will be covered with snowsheds, so that they can work all winter in spite of snow 10 or 12 feet deep for several months.

In proof of the confidence of the company and their superintendent in the value of this great ledge, the mill when finished will have cost $160,000; other structures, roads, etc., about $100,000 besides,

The Most Valuable Ore

Of the Mammoth is in a seam or chimney five feet wide, passing through the main ledge. This narrow vein is unquestionably very rich in free gold. Little, if any of it has yet been milled. It is reserved until the additions to the mill are

Its southern extensions in regular order towards the southeast are the Last Glimmer, the Ajax, and the Red Cloud or Chrysolite. Between the Jordan and the Mammoth is a claim called the Armstrong. On the next ledge east of the Alpha come, in succession from northwest to southeast, the Big Bonanza, Chief of the Hill and Panther. Next eastward, the Eureka corners at the southwest angle of the Mammoth, and its south extension is the Crescent City. Next east comes in above order to southward the Hutchinson, Foulk, Mammoth, Head Light, Monte Christo, Monticello, Baltic. Still eastward are the Tiger, the Don Quixote, the Wisconsin or True Blue (in dispute), the Great Eastern, the Silveropolis and Denis Kearney. A claim called the Merrimac, between the Monte Christo and Great Eastern, also conflicts with the True Blue. South of Merrimac is the Silverite. Still further southward, are the Black Hiller Geneva and Last Chance. Yet many as are the claims here named, they are not all that are located in this belt. Every space, whether granite, slate or porphyry seems to be located, judging from the monuments in every direction. For convenience of readers the accompanying map is repeated from the MINING AND SCIENTIFIC PRESS of December 28th, 1878.

is under Mr. Cross' management, shaft is over 80 feet, and ore good. John Riordon, who kindly spent a day showing me the various ledges, assures me that assays from his claims, the Eureka and Chief of the Hill, range from $50 to $250, some $10 or $20 of this being gold. The Merrimac assayed $15 silver, and $25 gold from ore 20 feet down, but at 30 feet depth, $20 silver and $60 gold. As usual, there are some conflicts about titles, but I learn from W. S. Lilien, U. S. Deputy Surveyor, that the Mammoth and Head Light now have their patents. The True Blue, Don Quixotic, Silveropolis, Crescent, and Monte Christo were already surveyed for patents.

The hotel conveniences of Mammoth City provide well for all visitors. The Monumental hotel, of Bunker & Co., is central and very comfortable. Here A. B. Anderson, a California pioneer, so well and favorably known as the genial host in Snelling and Fresno City, looks after the welfare of guests. He kindly accompanied your correspondent on one of his excursions. With other citizens, he takes deep interest in having our State Commissioners furnish their numerous lakes with fish. Why can this not be done?

Fresno Co., Aug. 2d.

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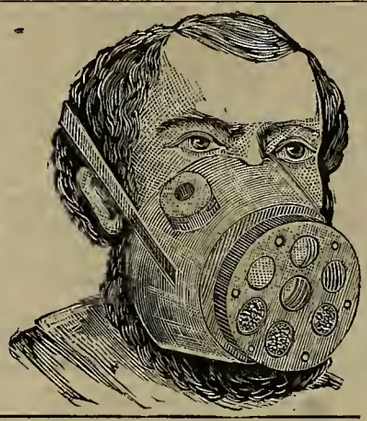

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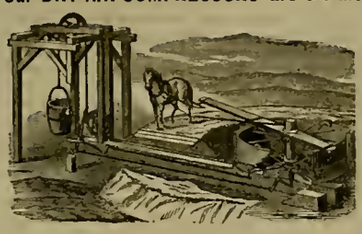

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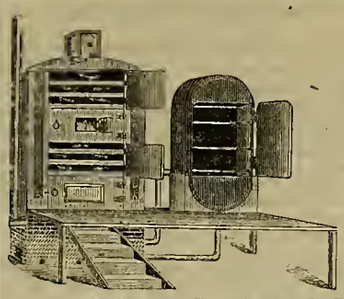

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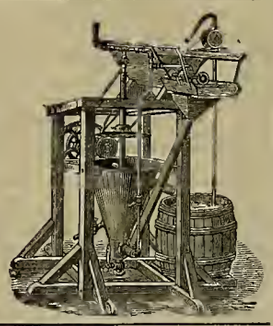

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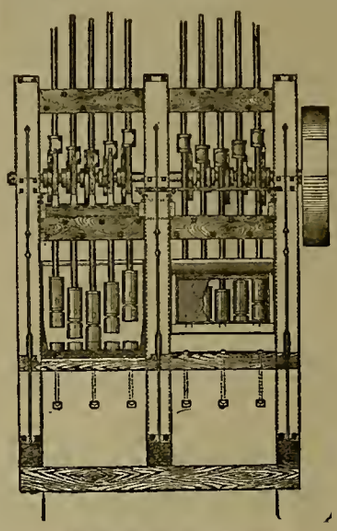

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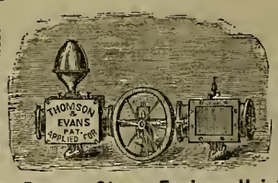

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[CONTINUED FROM PAGE 133.]

IDAHO.

ITEMS.—*Statesman*, Aug. 21: Snake River placers are all paying well, and new machines are being constructed. Weekly shipments of dust from Shoestons district to Carson, Nev., and San Francisco average $600. All the old mines around Rocky Bar and the adjacent camps are being relocated, and everything looks favorable.

SILVER CREEK.—*Independent*, Aug. 24: A 10-stamp mill is being put up on the Gloster lode. This lode is situated at the head of Piegan gulch, about one mile north from the Whipsville mine. The Gloster is quite a rich gold mine. One shaft is down 60 ft and over 150 ft of tunnels have been run. The vein has a width of seven ft.

MONTANA.

ITEMS.—*Miner*, Aug. 19: Six combination amalgamating pans and three settlers, from the works of Griffith & Wedge, Zanesville, Ohio, are now on the road to Philipsburg. Those pans and settlers will be added to those now in use in the Hope mill, when the mill, with its amalgamating capacity doubled, will continue to work the tailings upon which it has for the past few months been employed. The machinery for the Algonquin mill is almost all on the ground at Philipsburg. The pump station on the 500 level of the Alice was finished last Monday, and on Tuesday the mammoth Knowles pump was safely sent down the shaft and delivered at the station. The Olive Branch lode is becoming wider and more clearly defined as greater depth is reached. The ore is getting richer and more base as the lode increases in size. The first-class vein is now worked with something of the care observed in handling the precious metals, the ore being sorted and sacked in the drift as it is cut from the face, as it is considered too precious to be shoveled into a car and sent up in bulk. Of the first-class ore, averaging over 600 ounces of silver to the ton, as much as a ton and a half a day has been taken out by two men. It is all sold to the C. & M. smelting works. Copperopolis, on the Musselshell, where the lodes, as yet undeveloped, show clearly marked croppings that assay very well. On Birch creek a 50-ft shaft shows a well-defined vein rich in silver and gold. The Fraction, in Butte, on Rainbow, has the shaft down 130 ft and six men are still sinking it. The mine carries plenty of good ore.

ITEM.—Helena *Independent*, Aug. 21: A day or two since the workmen engaged in running a level east on the Whippoorwill lode came to place where the lode intersected with another. The body of quartz which had previously been but three ft in width suddenly increased to 14 ft, and its character changed from gold to silver bearing. The ore is free milling and is very rich. Some of the assays showing as high as $2,000 per ton. Several samples of ores from the A. M. Holter lode, on the Boulder, which were assayed for Chas. G. Hallbeck, of Radersburg, by Mr. Kemp, show it to be an exceedingly rich lode. First-class ores assayed 2,830 ounces per ton in silver and 42½% lead; second class, 328 ounces in silver.

NEW MEXICO.

ITEM.—Valuable deposits of carbonates of lead carrying a large percentage of free gold have been discovered near Santa Fe. The area now worked is about 40 acres.

OREGON.

MONUMENTAL MINE.—*Oregonian*, Aug. 16: This work on this mine comprises a tunnel run into the mountain over 700 ft, cutting in its course 16 ledges, two of which are opened to the surface. Ledge No. 10 is 256 ft and ledge No. 13 is 300 ft to the surface. Drifts are run from this tunnel into these and other ledges a distance of 200 to 300 ft. The ledges vary in width from six inches to four and one-half ft, and all carry high-grade antimonial and ruby silver ore. The present opening of the mine will furnish sufficient ore to run a 20-stamp mill for two years. The mill machinery is now on the ground and a force of 70 men are at work on its construction, and it will be ready for operation the last of September.

ITEM.—*Oregonian*, Aug. 25: The Swauk mines, on Swauk creek, about 25 miles from Ellensburg are paying about an ounce to the hand per day. The manner in which the claim is worked is this: When water is abundant the surface ground, from four to six ft, is ground-sluiced off, when the sluice boxes are set and the pay dirt, which is probably from one to four ft deep, is thrown into them and washed. This company took out with the aid of one arastra $1,500 in 30 days. The country has not yet been fairly prospected, and it is thought that when it is it will be found one of the best mining camps on the coast. Swauk creek runs through Kititass valley, and empties into the Yakima river, and is a little over 200 miles from The Dalles.

UTAH.

ITEMS.—Silver Reef *Miner*, Aug. 16: The Leeds mining company are now running night and day, with an abundance of water furnished by the recent rains. The mine is looking well. In the Last Chance the ore vein is extensive, and is a true fissure vein. It looks better than ever. In the Buckeye mine there are thousands of tons of ore in sight, and the probability is that before long an increased force of miners will be taking it out. In the Kinner mine the main working shaft is about 180 ft deep. About 150 ft north from the old workings is a perpendicular shaft 130 ft in depth. The ledge matter hoisted through this shaft shows plainly that the ore vein is in close proximity. Still farther to the north is a shaft 75 ft deep, from which some splendid ore has been hoisted. The average yield of ore is 15 tons daily, which is being shipped to the Stormont company's mill for reduction. This amount can be trebled when connection is made between the north and main shafts and good ventilation secured. The Sunbeam has reached a depth of 60 ft. The ore vein retains an average width of from four to five ft and has greatly increased in quality. The miners in the Duffin have struck it rich and in a short space of time extracted 84 tons of ore which pulped nearly $100 per ton. There are about 20 chloriders working on the mine now, all of whom are making money fast. The Independent has cut through a vein of ore four ft in width and very regular, assays from it going $20 to $30 per ton in silver.

ITEMS.—Salt Lake *Tribune*, Aug. 23: Work is to be resumed upon a number of claims in Star district. Godbe & Co.'s cave mine is looking splendid. A tramway is to be constructed from the mine to the Beaver river this month. J. H. Cook and A. G. Campbell are erecting a whim upon their mine, the Golden Era, situated in the foothills of Star. This mine has a showing of first-class smelting ore. New strikes are reported in every direction, and considerable prospecting is going on. Some of the new strikes are reliable, and gold ore has been found. Work has been resumed upon the Crœsus mine, and a contract has just been let to extend the tunnel, now in 150 ft, 100 ft further. A fine body of ore has been struck in the Vulcan mine, in the foothills of North Star district. The ore body is two and a half ft thick, permanent and going down. The ores will assay over 200 ounces in silver per ton, and from $3 to $8 per ton in gold.

New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's office at San Francisco:

METALLIC CON. G. & S. M. CO.—Object: To mine in Bodie district, Mono county, Cal. Capital, $10,000,000. Directors—F. Adams, Ellis Edwards, H. Mayers, M. Laverty and J. E. Squires.

BIG PRIZE M. CO.—Object: To mill and mine in Humboldt county, Nevada. Capital, $10,000,000. Directors—George Congdon, E. B. Pond, E. M. Hall, R. O. Brown and Samuel Linkton.

INDIANA M. & M. CO.—Object: To operate in Inyo county, Cal. Capital, $1,000,000. Directors—Caleb H. Maddox, Hugh Mauldin, H. S. Field, C. J. Humphrey and F. H. McConnell.

Science and Industry.

It has been a characteristic of man from the earliest times to encounter two elements of intelligence, as distinct in principle as mind and matter. The province of one of these elements was and still is to discover facts, and the application of these facts was and is now relegated to the other. Science in human economy is the mind, and industry the matter, twin sisters that walk hand in hand, the one ever ready to aid the other. The line drawn between these two elements is not as sharply defined in the present age as it was in the beginning and up to the beginning of the present century. Perhaps there never has been a time in the history of the world when industry could dispense with science, or that either alone could bring the people up to the most ordinary criterion of civilization as at present understood.

We find that all those nations, which either became devoted to science in the abstract or to the misapplication of facts pointed out by it, have either been entirely swallowed up beneath the waves of time and disaster, or now drag out a feeble, flickering existence. And on the contrary, those that understood and appreciated the intimate relations existing between science and industry, now rule the world. The question is not yet settled as to which of the present great nations can grasp and solve the problems constantly being propounded by science. The struggle is becoming more conspicuous from the fact that Europe has awakened to the belief that America will be the victor if her influence is not met in kind and counteracted. The United States has shown the world that we are at least 25 years in advance of other nations in the originality of our inventive genius and mechanical appliances, and we have, in spite of European cheap labor, attacked and taken by storm the trade centers of the world. England, France, Belgium and Switzerland are filled with alarm, and their wisest statesmen have declared themselves unable to cope against American ingenuity. And a weak opposition is made by the European press by depicting the evils of this American invasion. England and France are now maintaining a remarkable *entente cordiale*, in the shape of a private exhibition in the "Palace of Industry," in Paris, which is devoted to products intimately connected with the manufacturing industry, an indication of efforts being made to devise ways and means of getting rid of the American incubus.

Secretary Evarts, in his review of Consular reports, says: "For the first time our manufactures are now assuming international proportions. At a time of universal depression we have met those nations which held a monopoly of the world's markets, in their strongholds, and established the fact that American manufactures are second to those of no other nation."

We have not far to go to determine the cause of this. As a nation we possess more individuality than any other nation on earth. To think with us, is to act. The momentum of our progress is so great that we cannot stop. We have arrived at a correct understanding of the connection between science and industry and quick to apply even the suggestion of a utility. We have been able to create and supply a demand which European nations would not have thought of for years to come. This advance of American ideas is fully realized in England and on the Continent, and although strenuous efforts are being made to stop further progress, the only result so far has been to increase it to such an extent, that complaint has been made to Parliament concerning the unjust discriminations of English railways in favor of American produce. English writers and manufacturers begin to acknowledge that the supremacy of manufactures is the heritage of America. The immense energy displayed by the United States in carrying out its singleness of idea to excel the world, encumbered as she has been by difficulties which would have ruined any other nation, has leavened the easy-going characteristics of Europe and even the world to such an extent that American machinery and produce has become cosmopolitan.

BARTLING & KIMBALL, book-binders, paper rulers and blank book manufacturers, of No. 505 Clay street, are pioneers in their business in this city, and have, by promptness and reliability, built up a very large business from small beginnings. We have dealt with this firm ourselves for over fifteen years, during which time we have never had cause for complaint, so that we speak from experience. The book-binders business has become an important one of late years in this city, and it is peculiarly one in which good work must be done to satisfy patrons. A book shabbily or carelessly bound will look as well for a few weeks as one on which better work was done, but a month or two is sure to tell the story. One reason for the popularity of Bartling & Kimball is that their work is always good, and lasts, a proof of its excellence. They give employment to a large number of men, boys and girls, and are supplied with all the necessary machinery for carrying on an extensive business.

IN San Francisco half dollars are quoted at 99½ buying, 99⅝ selling; trade dollars, 97 buying, 98 selling; Mexican dollars, 98 buying, 98½ selling.

Death of R. B. Woodward.

R. B. Woodward, one of our most estimable and enterprising citizens, died suddenly on Friday, August, 22d. The story of his life is an illustration of how a man can pursue a public-minded career and yet attain great individual success; how a man can help the people and at the same time help himself. Mr. Woodward was born at Providence, Rhode Island, in February, 1824. He arrived in California in September, 1849, coming around the Horn, and bringing with him a limited stock of merchandise. Having started a store, Mr. Woodward soon after started a boarding-house in connection with it, designed only to accommodate miners coming to the city, and, in 1852, he built the house now standing on the corner of Sacramento and Leidesdorff streets, and gave it a name common in Rhode Island, the What Cheer House. The introduction of a library and museum in the What Cheer House made the hotel very popular with the swarms of miners and speculators who thronged San Francisco in the early days, and the moderate charges, in marked contrast to the rates prevailing in these days, made the establishment a public benefit. In 1862, the deceased built a residence on the site of the splendid piece of property known as Woodward's Gardens, ornamenting the grounds for his personal satisfaction only. During the war he opened the grounds to the public, the proceeds being devoted to the first sanitary funds sent East by Californians. Having once been opened, the gardens immediately became popular, and for many years they have been the pride of our citizens and the admiration of strangers. In adding to the museums, curios, animals, fish, etc., Mr. Woodward has expended upwards of $100,000, and the gardens at present are worth over $1,000,000. A few years since Mr. Woodward selected a fine piece of property at Oak Knoll, Napa county, which he purchased and on which he built a beautiful residence. He was largely interested in the construction of the Napa Valley Railroad, and to his assistance the success of the enterprise is largely due. Mr. Woodward's success as a business man is one of the remarkable features of his character. His aim was to meet the wants and means of the poorer classes in the matter of hotel accommodations and amusements. All his business undertakings were managed with great skill. His estate is estimated to be worth $2,000,000.

The Eruption of Mount Etna.

The late eruption of Etna seems to be even more serious than was at first supposed. The mountain has broken out at three different points, distant from each other 12 or 15 miles. It may be said that there are three separate eruptions going on at the same time. The most serious of the openings are those between the Monte Frumento and Monte Nero, an equal distance between Randazzo and Linguaglossa. At this spot the land is more highly cultivated. The flow of lava here seems to be immense and ever increasing in bulk. Here once stood the Bridge of the Pisciaro, which carried the national road over the torrent of that name, as it descends from the mountain to the Alcantara river. This bridge—the lava, no doubt, availing itself of the bed of the water course—has been carried away by the avalanche of boiling lava, and the road is overflowed with lava for about 100 meters. The other two points of outbreak are—one between Bronte and Aderno, on the western slope; the other between Giarre and Aci Reale, on the southern. The former seems to send out a small quantity of lava, in the first instance threatening the town of Aderno, but now considerably lessened in force. The whole population in the neighborhood of Etna is in a state of panic: the awful roars of the mountain heard from all sides, the vomitings of lurid smoke, and the rain of ashes and cinders are not calculated to restore the confidence disturbed in the first instance by the shocks of earthquake, the precursors of this calamity. News by a recent dispatch from Messina says: "Renewed and frequent shocks of earthquake, attributed to the volcanic action of Mount Etna, have occurred in the neighborhood of Santa Venere and Guardia, causing serious damage. Several houses have fallen in, and others are in danger. The loss of life is considerable. Communication by road is interrupted." An earthquake of great violence occurred near Aci Reale, in the province of Catania. Immediately after the opening of the sitting of the Chamber, Deputy Romeo read a telegram to the House announcing that five villages had been almost wholly destroyed. Ten persons had been killed and several injured. —*Illustrated London News.*

THE GREAT MEXICAN RAILROAD.—One of the most collosal modern engineering enterprises has been the construction of the great railroad from Vera Cruz to the City of Mexico. It passes through one of the most picturesque countries in the world, and, traversing the mountain chain of the great Sierra, offers the finest views imaginable. The road is 268 miles long, passes through 18 tunnels, and over several magnificent iron bridges; it has cost $40,000,000, and is considered to be the finest and best constructed railway on the whole American continent.

News in Brief.

WHEAT is higher.

FLOODS in England continue.

THE Greeks are arming to fight.

GOV. FREMONT has gone to Prescott.

THE blockade of Innique, Peru, is suspended.

PERSIA is threatened with a disastrous famine.

IT has rained steadily at Victoria for five days.

THE revolution in Hayti has been brought to a close.

THE demand for U. S. bonds is increasing in London.

THE International Grain fair opened at Vienna August 25th.

YELLOW FEVER is said to be spreading at New Orleans.

THE plague has appeared on the Turko-Persian frontier.

GRAIN crops in France have been improved by fine weather.

DEPUTIES to the Prussian Diet will be voted for October 7th.

NIHILISTS are being arrested in Sweden by request of Russia.

THE Edison telephone is being set up in all the quarters of Paris.

THE State Teachers' Association of Oregon is in session at Portland.

DROUTH has made the maize harvest in Servia very unpromising.

ROWLAND HILL founder of the penny postage system, is dying, aged 85.

EIGHT MILLION immigrants have arrived in this country since 1847.

STEAMER *France*, from Havre, brought $800,000 in gold bars recently.

CAPT. WEBB has challanged Paul Boynton to another swimming match.

STATE SENATOR, J. S. PALMER, of Corvallis, Or., died suddenly Sunday.

THERE are 7,000 workingmen out of employment in Quebec and vicinity.

ALMOST a famine prevails among the tenant farmers in the west of Ireland.

A NUMBER of Swiss, French and Belgian colonists have gone to New Guinea.

A TERRIFIC cyclone struck Orange, Texas, August 22d, doing great damage.

STORMS at Pittsburg during the past two days have caused considerable damage.

LORD GORDON (Edward Stratheam) one of the English Judges of Appeal is dead.

THE female Nihiliste recently sentenced to exile in Siberia is only 15 years old.

SILVER in London, 51¾; consols, 97 15-16; 5% U. S. bonds, 105⅝; 4s, 104½; 4½s, 108½.

THE Caledonia and Lady Bryan mining companies have levied assessments of 50 cents.

THE entire river front of Crittenden county, Arkansas, is quarantined against Memphis.

JOHN BALDWIN BUCKSTONE, the comedian and author, is dying in London, in destitution.

LUKE MONIHAN, a farmer, near Phœnix, Arizona, was murdered recently by John Keller.

ANOTHER important discovery of coal is reported to have been made near Victoria, B. C.

THERE was a demonstration at Glasgow, Scotland, August 21st, of 2,000 unemployed laborers.

SECRETARY SHERMAN makes a pledge that the silver dollar shall be in value equal to one dollar.

REGISTRAR KAPLAN has discovered attempts at wholesale fraude in registration at San Francisco.

AT Liverpool wheat is quoted at 8s 6d@9s 6d for average California white, and 9s 5d@9s 10d for club.

J. F. GRAHAM, cashier of the Central Pacific railroad at Ogden, has been arrested for embezzlement.

MILTON FARROW, an American, gained the first three prizes at the great shooting contest at Versailles.

THE steamship *Victoria* has been fined at Victoria, B. C., $400 for an infraction of the revenue laws.

THE Treasury Department shipped to different States during August $511,500 in standard silver dollars.

MANY picknickers were poisoned August 22d at Muckwonago, Wis., by drinking lemonade made of tartar emetic.

W. R. BELL, cashier of an express company at Kansas City, Mo., is missing, together with $10,000 of the company's funds.

THE Coroner's jury in the case of the Italians killed by a Sheriff's posse at Fish creek, Nev., justify the conduct of the officers.

IN New York Government bonds are quoted at 100⅞ for 4s of 1907; 101⅞ for 5s of 1881; 105½ for 4½s; sterling, $4 82@4.84; silver bars, 112⅜; silver coin, ½@1 discount.

A SHOCKING AFFAIR.—A tragedy occurred in this city on Saturday morning last which excited the people, and at one time led many to fear a public disturbance. Chas. DeYoung, proprietor of the S. F. *Chronicle*, shot Rev. I. S. Kalloch, Workingmen's candidate for Mayor, on Jessie street, near the Metropolitan Temple. DeYoung's paper had published a series of severe articles upon Kalloch's life and antecedents, and Kalloch retaliated by scoring the DeYounge in a public speech on Friday evening. On Saturday morning DeYoung lay in wait for his victim, and shot him through the window of a cab in which he concealed himself for the purpose. Kalloch was severely wounded in breast and thigh, and though his death has been expected, he has lived, and has some show for recovery. DeYoung is in prison awaiting the result of his shooting.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS TO DEWEY & CO.'S MINING AND SCIENTIFIC PRESS PATENT AGENCY.]

FOR THE WEEK ENDING AUGUST 19TH, 1879.

218,704—SAFE SPINDLE—J. D. Bruner, S. F.

218,721—SPOKE TENON AUGER—R. W. Eaton, Watsonville, Cal.

218,671—MANUFACTURE OF ETHYL-CHLORIDE—J. F. Gesner, S. F.

218,762—EXPLOSIVE COMPOUND—A. Monnier, S. F.

218,683—FEEDER FOR THRESHERS—H. S. Norton and J. Edgar, Sacramento, Cal.

218,767—HUB-MORTISING MACHINE ATTACHMENT—P. H. Parsons, S. F.

218,694—PUMP OPERATING MECHANISM—J. J. Verckler, San Leandro, Cal.

The following foreign patents have been issued to residents of this coast:

Canadian.

9,094 Wuir—F. Hopkins, Helena, Montana. Aug. 6, 1878.

9,422—STOP COCK—S. M. Denniston, Silver City, Idaho. Dec. 2, 1878.

9,460—LINK OR HOOK CONNECTON—F. Kortick, S. F. Dec. 19, 1878

9,625—COOKING STOVE—H. L. Howse, S. F. Feb. 4, 1878.

9,646—BATTING APPARATUS—W. Wasson, Carson, Nev. Feb. 11, 1879.

9,790—ORE REDUCING PROCESS—J. A. Robertson, J. W. Stifl and A. Dreth, Oakland, Cal Mar. 27, 1879.

9,832—CANDLESTICK—A. J. Smith and E. A. Bonnle, Uklah, Cal. Apr. 12, 1870.

9,902—COMPOUND FOR CURE OF CANCERS, ETC—L. J. Dart, Albion, Cal. May 13, 1870.

9,973—SPRING FOR CARS—G. E. Gray and C. W. M. Smith, S. F. May 17, 1870.

10,040—MOTOR ENGINE—E. J. Molera and J. C. Cebrian, S. F. June 7, 1879.

10,041—MOTOR ENGINE—E. J. Molera and J. C. Cebrian, S. F. June 7, 1879.

10,042—MOTOR ENGINE—E. J. Molera and J. C. Cebrian, S. F. June 7, 1879.

10,060—BOOT FASTENING—Eli Rees, Merced, Cal. June 7, 1879.

10,115—COOKING STOVE—H. L. Howse, S. F. June 23, 1879.

10,194—FEEDER FOR THRESHERS—J. Edgar, Sacramento, Cal. July 3, 1879.

10,204—PISTON PACKING—S. A. Youse, Sutter Creek, Cal. July 9, 1879.

10,234—DIRECT ACTING ENGINE AND DRILLING APPARATUS—H. Richman and U. K. Arnold, S. F. July 14, 1870.

German.

6,064—PRODUCING A NEW EXPLOSIVE—E. Judson, S. F.

English Patents.

Which have passed the Great Seal:

299—APPARATUS FOR PRODOCING LIGHT BY ELECTRICITY—E. J. Molera and J. C. Cebrian, S. F.

562—FASTENING FOR BOOTS—Eli Rees, Merced, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telgraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

HUB-MORTISING MACHINE ATTACHMENT.—Plummer H. Parsons, Sacramento, Cal. Dated Aug. 19th, 1879. This invention relates to a novel attachment for that class of machines which are used for forming the mortises in wheel-hubs, into which the spokes are driven. These mortises are formed by suitable cutters, while the hub is supported in a horizontal position upon an apparatus which is provided with a spacing-disk to suit the number of spokes which the wheel is to have. After these mortises have been cut, it is customary to bevel-off the sides of each mortise with a chisel by hand to receive the shoulders of each spoke, which consumes much time and is not accurate. This device consists in the employment of a rotary cutter provided with an adjusting device, so that each mortise can have its beveled edges formed of exactly the same depth as rapidly as the hub can be turned upon its support. Full information of this attachment may be had on application to Messrs. Waterhouse & Lester, Nos. 29 and 31 Fremont street, San Francisco.

SPOKE-TENON AUGER.—Robert W. Eaton, Watsonville, Cal. Dated Aug. 19th, 1879. This device relates to certain improvements in turning augers, and it consists in a novel construction of the cutter-head, and in a means for adjusting and making it center with the mandrel. By this construction the inventor is enabled to maintain any tenon in the center of the mandrel while being cut, so that when the mandrel is turned, its axis will correspond with that of the tenon.

THE CHANNEL TUNNEL.—It appears that the boring that is making at Sangette, in France, is not the beginning of the shaft from which the tunnel is to be bored, but is merely an experimental bore-hole, some five or six hundred yards above the village and about 100 yards from the shore, so that it is small wonder that for three months the work has been suspended, because of the too rapid infiltration of water, while a new pump of double the capacity of the present one is building, that is, one which can raise about 675 gallons a minute. The shaft for the tunnel when it is begun is to be sunk in the village itself, and will be sunk to such a depth as the experiments now making shall show to be necessary. The experimental shaft, which is at present only 123 feet deep, is to be sunk to a depth of 260 feet, the diameter of the bore being 11 feet.

LOCOMOTIVES FOR TOWING.—An experiment has recently been tried with success in France in using locomotives for towing in canals. A railway is laid down on the tow path about three feet from the side of the canal, and on this run small locomotives of four or more tons, according to the weight to be pulled. One man suffices to manage the locomotive. The cable used is about 180 feet long. In one experiment the locomotive weighed four and a half tons, including water and coal; the transported weight was 468 tons, excluding the weight of the vessel's iron hull. The actual velocity reached 2.5 miles an hour, which, on deducting delays (from crossing other vessels, passing through two bridges, etc.), was reduced to an average of two miles per hour. The towing of an empty vessel on the return journey attained a speed of six miles per hour; but so high a speed would injure the banks. It is estimated that three miles an hour should not be exceeded, and this would, in the circumstances, be reduced to 2.5. The mean speed of a horse on the towing path is only about one mile per hour, and the advantages of the other plan were fully demonstrated.

EYE PHOTOGRAPHING.—At the London Photographic Society, on May 13th, Mr. W. G. Bird read a paper on the "Photographic Vision," showing from researches made by Kuhne and Boll, that a visual purple pigment exists in the eye, and that a theory is based upon this fact of a result similar to that which takes place in photography. A fixation takes place of an image in the eye by physical changes in certain minute rods and cones found in some membranes of the retina. The experiments appear to confirm the old theory that the eye of a deceased person or animal retains the last visual impression made upon it.

EVERY new subscriber who does not receive the paper, and every old subscriber not credited on the label, should write personally to the publishers without delay, to secure proper credit. This is necessary to protect ourselves and subscribers against the acts and mistakes of others.

OUR AGENTS.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. L. THARP—San Francisco.
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The following volumes and single copies of the MINING AND SCIENTIFIC PRESS are wanted at this office, for which a reasonable price is offered:

Year.	Volume.	
1870	20	2 Complete volumes, 1st half (of year).
1870	20	2 Copies of No. 2, Jan. 1st.
1870	20	1 Copy each of No. 1, Jan 1st, 3 of Jan. 14th, 7 Feb. 11th, 6 Feb. 4th.
1870	21	1 Copy of No. 7, August 13th.
1871	22	6 Copies of No. 1, Jan. 7th.
1871	22	3 Copies of No. 5, Feb. 4th.
1871	22	1 Copy of No. 3, Jan. 21st, 6 of Feb. 2d, and 1 of May 1st.
1871	23	1 Copy of No. 2, July 15th, and 9 Sept. 2d.
1872	24	2 Copies of No. 4, Jan. 27th.
1872	24	3 Copies of No. 7, Feb. 17th.
1872	24	2 Copies of No. 17, April 27th.
1872	25	1 Copy of No. 10.
1872	25	1 Complete volume, last half (of year).
1873	26	3 Copies of No. 8, Feb. 22d.
1873	26	3 Copies of No. 9, March 1st.
1873	26	2 Copies of No. 10, March 8th.
1873	26	1 Copy of No. 7, Feb. 15th.
1873	27	3 Copies of No. 20, Nov. 15th.
1873	27	4 Copies of No. 21, Nov. 22d.
1873	27	3 Copies of No. 24, Dec. 13th.
1875	30	1 Copy of No. 4, Jan. 23rd.
1875	30	1 Copy of No. 5, Jan. 30th.
1876	30	1 Copy of No. 8, Feb. 20th.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

HOW TO STOP THIS PAPER.—It is not a herculean task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

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EXPERIMENTAL MACHINERY, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. See ad. F. W. FULLER, 416 Market St., second floor, S. F.

Chew JACKSON'S BEST Sweet Navy Tobacco

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & CO.]

SAN FRANCISCO, August 27, 3 P. M.

SILVER 26.

GOLD BARS, 890@910. SILVER BARS, 6@16 ⅜ cent. discount.

EXCHANGE on New York, 20, on London bankers, 49¾@49¾. Commercial, 50; Paris, five francs ⅜ dollar; Mexican dollars, 90¼@92½.

LONDON CONSOLS, 97⅞; Bonds (4%), 104¾.

QUICKSILVER in S. F., by the flask, ⅜ lb, 33½c.

GENERAL MERCHANDISE.

[WHOLESALE.]

WEDNESDAY M., August 27, 1879.

CANDLES.

Crystal Wax	17 @—
Eagle	12 @—
Patent Sperm	30@—

CANNED GOODS.

Assorted Pie Fruit.	
2½ lb cans	2 25 @ —
Table do	3 50 @ —
Jams and Jellies	3 75 @ —
Pickles, hf gal	3 25 @ —
Sardines, qr box	1 67½@1 90
Hf Boxes	2 50 @2 75
Merry, Faull & Co.'s.	
Preserved Beef.	
2 lb. doz	3 75 @4 00
do Beef, 4 lb. doz	6 50 @ —
Preserved Mutton.	
2 lb. doz	3 75 @ —
Beef Tongue	6 50 @ —
Preserved Ham.	
2 lb. doz	8 50 @ —
Deviled Ham, 1 lb. doz	5 50 @ —
do Ham, ½ lb. doz	3 00 @ —
Boneless Pigs Feet,	
3 lbs	4 50 @ —
2 lbs	3 75 @ —
Spiced Fillets.	
2 lbs	4 25 @ —
Head Cheese.	
3 lbs	4 25 @ —

COAL—Jobbing.

Australian, ton	6 00 @ 6 50
Coos Bay	— @ 5 50
Bellingham Bay	— @— —
Seattle	5 50 @ 6 00
Cumberland	12 00 @15 00
Mt Diablo	4 75 @ 6 00
Lehigh	11 50 @12 50
Liverpool	6 00 @ 6 50
West Hartley	— @ 8 00
Scotch	— @ 8 00
Scranton	— @— —
Vancouver Id	8 00 @— —
Charcoal, sack	76 @— —
Coke, bush	60 @— —

COFFEE.

Sandwich Id, lb	— @— —
Costa Rica	16 @ 16½
Guatemala	16 @ 16½
Java	25 @— 26
Manila	17 @— —
Ground, in cs	25 @— —

FISH.

Sac'to Dry Cod	— @ 4
do in cases	5 @ 6
Eastern Cod	— 7 @— 7½
Salmon, bbls	8 00 @ 9 00
Hf bbls	5 00 @ 5 50
1 lb cans	1 10 @ 1 12½
Pkld Cod, bbls	22 00 @— —
Hf bbls	11 00 @— —
Mackerel, No. 1.	
Hf Bbls	9 50 @10 00
In Kits	1 85 @ 2 10
Ex Mess	3 25 @— —
Pkld Herring, bx	3 00 @ 3 50
Boston Smkd Hrg	70 @— —

LIME, Etc.

Plaster, Golden Gate Mills	3 00 @ 3 25
Land Plaster, tn	10 00 @12 50
Lime, Sta Cruz, bbl	1 25 @ 1 50
Cement, Rosendale	2 00 @ 2 25
Portland	4 00 @ 4 50

NAILS.

Ass'ted sizes, keg	2 70 @ 2 75

OILS.

Pacific Glue Co's	
Neatsfoot, No 1	1 00 @ 90
Castor, No 1	1 35 @ —
do, No. 2	1 30 @ —
Baker's A A	1 25 @1 30
Olive, Plagniol	5 25 @5 75
Possel	4 75 @5 25
Palm, lb	9 @ —
Linseed, Raw, bbl.	78 @ —
Boiled	80 @ —
Cocoanut	55 @ —
China nut, cs	— @ 65
Sperm	1 40 @ —
Coast Whales	— @ 32½
Polar	— @ 35
Lard	— @ 70
Oleophine	22 @ 22
Devoe's Brll't	17½@ 18½
Photolite	— @ —
Nonpariel	31 @ 32½
Eureka	18 @ 42½
Barrel kerosene	20 @ —
Downer Ker	35 @ —
Elaine	37½@ —

PAINTS.

Pure White Lead	8 @ 8½
Whiting	1½@ —
Putty	4 @ 5
Chalk	1½@ —
Paris White	2½@ —
Ochre	3½@ —
Venetian Red	3½@ —
Averill Mixed Paint, gal.	
White & tints	2 00 @2 40
Green, Blue & Ch Yellow	3 00 @3 50
Light Red	3 00 @3 50
Metallic Roof	1 30 @1 60

RICE.

China, Mixed, lb	4½@ 6
Hawaiian	6 @ —

SALT.

Cal. Bay, ton	15 00 @22 50
Common	10 00 @12 00
Carmen Id	12 00 @14 00
Liverpool fine	19 00 @— —

SOAP.

Castile, lb	8 @ 15
Common brands	4½@ 6
Fancy brands	7 @ 8

SPICES.

Cloves, lb	— @ 45
Cassia	19 @ 20
Nutmegs	85 @ 87½
Pepper Grain	— @ 12
Pimento	19 @ 20
Mustard, Cal. ½ lb glass	— @1 25

SUGAR, ETC.

Cal. Cube, lb	— @ 10½
Powdered	— @ 10½
Fine crushed	— @ 10½
Granulated	— @ 10
Golden C	— @ 8½
Cal. Syrup, kgs	70 @ —
Hawaiian Molasses	26 @ 30

TEA.

Young Hyson, Moyune, etc	— @ 51
Country pckd Gunpowder & Imperial	— @ 42½
Hyson	30 @ 35
Fooo-Chow O	35 @ —
Japan, 1st quality	40 @ —
2d quality	20 @ 2

METALS.

[WHOLESALE.

WEDNESDAY M., August 27, 1879.

IRON.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2¾@ 3½
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 7
Norway, according to thickness	6½@ 7
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @
TIN PLATES.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb. less than cask	9½@— 10
NAILS.—	
Assorted sizes	2 90@3 00

LUMBER.

WEDNESDAY M., August 27, 1879.

CARGO PRICES OF PUGET SOUND PINE

REDWOOD.

Rough, M	13 00
Refuse	9 00
Clear	23 00
Clear Refuse	13 00
Rustic	23 50
Refuse	18 00
Surfaced	20 00
Refuse	14 00
Flooring	30 00
Refuse	12 00
Beaded Flooring	23 00
Refuse	13 00
Half-inch Siding	16 00
Refuse	14 00
Half-inch Surfaced	20 00
Refuse	14 00
Half-inch Battens	16 00
Pickets, Rough	11 00
Rough, Pointed	12 50
Fancy, Pointed	18 00
Shingles	1 76

RETAIL PRICE.

Rough, M	18 00
Fencing	18 00
Flooring and Step	28 00
Narrow	30 00
2d quality	25 00
Laths	3 50
Furring, lineal ft	

REDWOOD.

RETAIL PRICE.

Rough, M	18 00
Refuse	14 00
Pickets, Rough	15 00
Pointed	16 00
Fancy	22 50
Siding	20 50
Surfaced & Long Beaded	30 00
Flooring	30 00
Refuse	22 50
Half-inch Surfaced	30 00
Rustic, No. 1	30 00
Battens, lineal ft	
Shingles M	2 00

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending August 26, 1879.

HIGHEST AND LOWEST BAROMETER.

Aug. 20	Aug. 21	Aug. 22	Aug. 23	Aug. 24	Aug. 26	Aug. 26
29.934	29.912	29.901	29.835	29.796	29.886	20.936
29.894	29.876	29.804	29.762	29.720	29.805	29.891

MAXIMUM AND MINIMUM THERMOMETER.

64	67	70	64	79	65	65
54	63	60	55	67	65	65.5

MEAN DAILY HUMIDITY.

80.3	87.3	83.3	81.3	60	80.3	84.3

PREVAILING WIND.

W	W	W	W	W	W	W

WIND—MILES TRAVELED.

275	349	157	286	187	322	338

STATE OF WEATHER.

Fair.	Fair.	Clear.	Fair.	Clesr.	Clear.	Fair.

RAINFALL IN TWENTY-FOUR HOURS.

		.02				

Total rain during the season, from July 1, 1879. 0.03 in.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Gover Mining and Milling Company.—

Principal place of business, San Francisco, California. Location of works, Amador county, near Drytown, California.

Notice is hereby given that at a meeting of the Board of Trustees, held on Wednesday, the 6th day of August, 1879, an assessment (No. 39) of Fifty Cents per share was levied on the capital stock of the corporation, payable immediately in gold coin or legal currency of the United States, to the Secretary, at the office of the company, Room 8, No. 402 Front street, San Francisco, California.

Any stock upon which said assessment shall remain unpaid on Tuesday, the 9th day of September, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 6th day of October, 1879, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Trustees. W. O. WILSON, Secretary.

Office, Room 8, No. 402 Front street, San Francisco, Ca

Annual Meeting—Safety Powder Co.

Notice is hereby given of the annual meeting of the stockholders of the Safety Powder Co., at their office, corner Octavia and Greenwich streets, on Saturday, the 30th day of August, 1879, at the hour of three o'clock, P. M. By order of the President.

S. O. GREGORY, Secretary.

Amusements.

CALIFORNIA THEATER.

BARTON & LAWLOR.....Manager.
BARTON HILL.....Acting Manager.

ROBSON & CRANE.

Bush Street, above Kearny. Open every evening. Box office open from 9 A. M. to 10 P. M. Seats may be secured six days in advance.

BALDWIN'S THEATER.

THOMAS MAGUIRE.....Manager.
CHAS. H. GOODWIN.....Treasurer.
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HAVERLY'S MINSTRELS.

Open every evening and Saturday Matinee.

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Having complete arrangements with competent and reliable parties in Washington City, by which we are able to secure prompt and careful attention to law business there, we are prepared to assist Mill and Mine, Canal and Ditch owners in securing patents for their lands, mines and claims, in addition to our general line of patent business.

Many who are acquainted with the manner in which this business has heretofore been conducted, (with or without assistance by local attorneys), will see at once the great advantage of patronizing an establishment that is thoroughly organized and has its representatives in Washington to look after and prosecute their applications before the Commissioner of the General Land Office. The business on this Coast will be attended to personally by a member of our firm, and satisfaction will be given in all respects.

Correspondence from persons desirous of securing patents for Lands, Mines, Mill Sites, Canal and Ditch property, promptly attended to.

Applicants for patents for mining and farming land, whose claims have been delayed for any reason, will find it to their advantage to consult with us and in case of necessity secure the services of our home and Washington branch agency.

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Solicitors of Patents for Lands, Mines and Inventions, MINING AND SCIENTIFIC PRESS OFFICE, No 202 Sansome St., San Francisco.

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All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch. PRICES MODERATE.

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THOMPSON BROTHERS,

EUREKA FOUNDRY,

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VERTICAL ENGINES,	BABY HOISTS,	STAMPS,
HORIZONTAL ENGINES,	VENTILATING FANS,	PANS,
AUTOMATIC CUT-OFF ENGINES,	ROCK BREAKERS,	SETTLERS,
COMPOUND CONDENSING ENGINES,	SELF-FEEDERS,	RETORTS,
SHAFTING,	PULLEYS,	ETC., ETC.

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Steam Engines and all Kinds of Mill and Mining Machinery.

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Propeller Engines either High Pressure or Compound Stern or Side Wheel Engines.

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Hoisting Engines and Works, Cages, Ore Buckets, Ore Cars, Pumping Engines and Pumps, Water Buckets, Pump Columns, Air Compressors, Air Receivers, Air Pipes.

Mill Machinery.

Batteries for Dry or Wet Crushing, Amalgamating Pans, Settlers, Furnaces, Retorts, Concentrators, Ore Feeders, Rock Breakers, Furnaces for Reducing Ores Water Jackets, Etc.

Sugar Machinery.

Crushing Rolls, Clarifiers, Vacuum Pans, Air Pumps, Concentrators, Bag Filters, Charcoal Filters, Blow-up Tanks, Coolers and Receiving Tanks.

Miscellaneous Machinery.

Flour Mill Machinery, Saw Mill Engines and Boilers, Dredging Machinery, Oil Well Retorts, Powder Mill Machinery, Water Wheels.

Engines and Boilers of all kinds, either for use on Steamboats and made in accordance with the Act of Congress regulating the same, or for use on land. Water Pipe, Pump or Air Column, Fish Tanks for Salmon Canneries of every description.

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ROLLED BEAMS, ANGLE, CHANNEL AND T IRON, BRIDGE AND MACHINE BOLTS, LAG SCREWS, NUTS WASHERS, ETC., STEAMBOAT SHAFTS, CRANKS, PISTONS, CONNECTING RODS, ETC., ETC.

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Agents for the Allen Engine Governor, Bailey Air Compressor, Howell's Improved White Furnaces, Walker's Compound Steam Pumps, Etc.

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STEAM VESSELS, of all kinds, built complete with Hulls of Wood, Iron or Composite.

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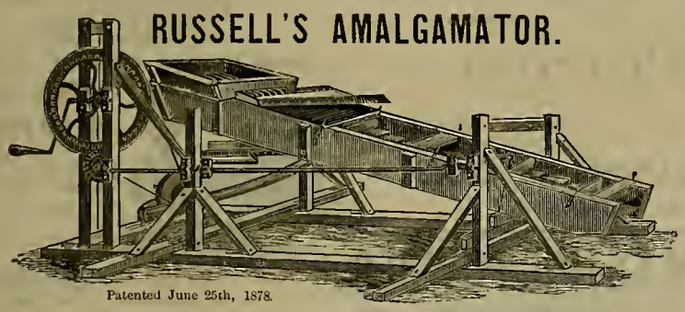

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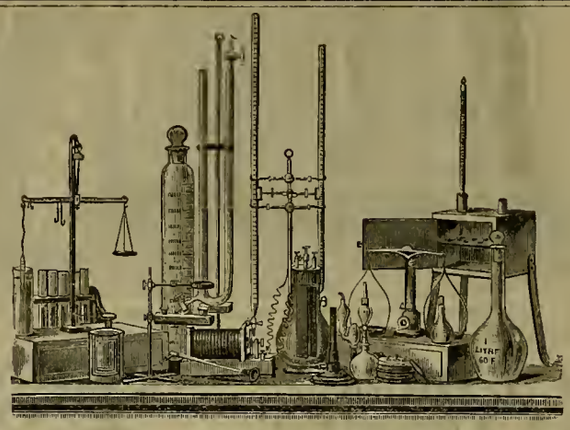

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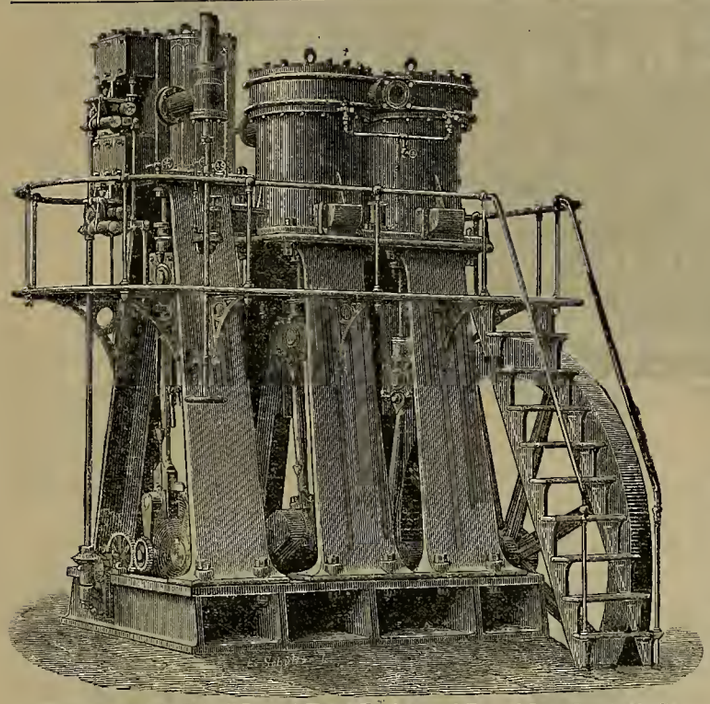

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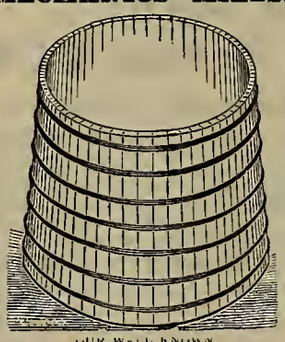

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, SEPTEMBER 6, 1879.

VOLUME XXXIX Number 10.

Sandholdt's Tap and Faucet.

We illustrate herewith an improved tap and faucet, recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency, by Samuel Sandholdt, of Centerville, Alameda county. Many attempts have been made to substitute a permanent tap for the small spruce plugs which are usually employed to stop the faucet hole when a barrel is refilled with beer, and for this purpose, hollow screw plugs have been fitted into a screw bushing, these plugs having valves, and being operated by the action of screwing into the faucet. The holes in these plugs being necessarily small are often stopped by sediment or pieces of hop leaves, and as they cannot be removed, it is impossible to clean them perfectly, while the screw bushing will in time become loose and leak. Mr. Sandholdt's device is designated to overcome these obstacles by certain details of construction which the engraving will explain.

A, represents the head of the barrel or cask, into which the hollow internally and externally threaded sleeve, *B*, is screwed. An internally and externally threaded bushing, *C*, corresponding in length to the sleeve is screwed into it. This bushing or thimble is countersunk at each end, as shown, so that a tight joint is formed. The outer edge of the bushing, *C*, is provided with a flange or shoulder having a washer, so that when the bushing is screwed into the sleeve, *B*, this shoulder comes against the seat formed in said sleeve, and a tight joint is thus made. In this flange or shoulder are cut notches or slits by means of which a wrench may be applied so as to remove it from the sleeve when necessary.

Into this bushing, *C*, fits a plug or tap, *D*, having screw threads formed on it. At each end of this plug is a square head, *b*, for screwing it in or out, and on its inner end is a flange or shoulder, with a washer, and when the plug is screwed into place in the bushing, this washer and shoulder fit close into the countersunk portion of the sleeve on the inner side, thus forming a tight joint.

The faucet, *E*, has threads formed on it to correspond with those on the interior of the bushing, *C*, and at its end is a recess formed of suitable size and shape to fit over the square head, *b*, of the tap. On the faucet, *E*, is screwed a nut and washer, *G*, which may be screwed down the faucet and fit against the countersunk portion of the bushing to make a tight joint.

The sleeve is attached to the barrel by screwing it in a little. The bushing, *C*, is taken out of the sleeve, and the plug is screwed into this bushing until the flange and washer fits snug into the countersunk inner end of said bushing. The bushing is then screwed back into the sleeve by means of the notches on its edge, until the shoulder fits into the seat on the sleeve, the flanged end of the plug in said bushing being on the inside. The band is then tight and the contents cannot escape.

When it is desired to draw any liquor from the barrel, the faucet is placed in a position so that the recess on its end will fit over the outer square head of the tap. The faucet is then screwed in a short distance, when the nut and washer on said faucet are screwed down so as to fit tight against the outer countersunk end of the bushing, making a tight joint at that place. The faucet is then screwed further into the bushing, gradually unscrewing the tap as it enters, until the faucet takes the place of the tap and the tap falls into the barrel.

An opening is formed lengthwise in the faucet, communicating with the recess, so that as soon as the tap falls into the barrel the liquor may be drawn off through the faucet. The valve, *H*, regulates the flow. When the barrel is empty the tap may be removed through the bunghole, or the bushing may be removed and the tap taken out through the sleeve into which said bushing screws.

In this way a tap and faucet is provided which has no springs to get out of order and which is simple in construction. No injurious pounding is necessary to insert it in the barrel, and any one may tap a barrel of beer without danger of any loss of contents by its spurting out just as the faucet is being inserted. The joints are kept perfectly tight by the shoulders or flanges with washers on the inner end of the tap, and by the nut and washer on the faucet, so that no leakage can occur by the insertion of the faucet and displacement of tap or plug.

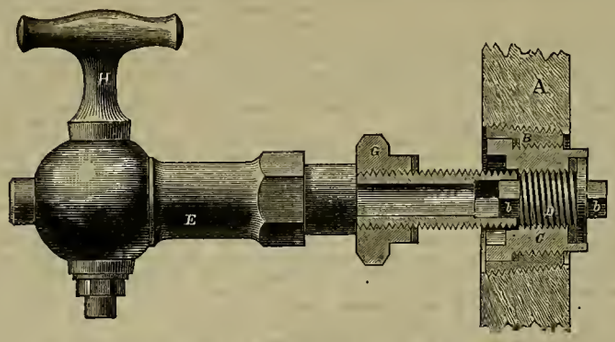
Electricity as an Illuminator.

The electric light as an illuminator, its cost when compared with that of gas, and the most economical mechanical means of generating it, are questions of sufficient importance to attract the attention of the scientific world. In view of the careful estimates made both in Europe and America it is doubtless proper to say that the question of cost is gradually nearing its final settlement. From experiments lately made in London for illuminating the Thames embankment and the Holborn viaduct, we learn from *Engineering* that a careful estimate of the expense has proved that the cost was the same as that of gas of equal illuminating power, without counting the interest on the expense of the plant of machinery and steam power, and their distribution. When this was added the cost of the electric light was found to be more than double that of gas. It appears that the machinery was very imperfect, the electric carbon lamps or candles of Jablochkoff were very defective, and that there was a most wasteful diffusion and obscuration of the electric light. It was the same in the Kensington Museum, which afterward was lighted with eight of Werderman's lamps. The electric generator employed was one of the early and obsolete Gramme machines, driven by a gas engine of 4½ horse-power, and consuming 280 cubic feet of gas per hour. If we reckon the gas at only $2 per 1,000 cubic feet, it amounts to 56 cents per hour, while 4½ horse-power obtained from coal would require 20 pounds of coal per hour at the utmost, which, at $3 per ton, is three cents per hour, so that the gas costs almost 20 times as much as coal would have cost. The eight electric lamps took the place of 30 argand burners, consuming together 140 cubic feet of gas per hour; so that the electric lamps required for their feeding twice the amount of gas sufficient for the gas burners. The English papers, however, are confident that better results would have been obtained if better machinery had been employed, and we think so too.

Madison Square garden, in the city of New York, as is stated in an exchange, is now lighted up by 14 electric lamps, furnished with their required electric currents by 14 Fuller magneto-electric machines, driven by steam power, and furnishes the following details: The large building is 400 by 200 feet in size, and required 4,000 gas jets, the gas bill per night being $60. The electric illumination now used in lieu thereof was offered at one-half the cost of the gas. The steam engine driving the 14 magneto-electric machines was stated to exert 60 horse-power: The coal consumed in a Babcock & Wilcox water tube boiler was half a ton per night of five hours, or nearly 3½ pounds per horse-power per hour. The engine is a Porter-Allen engine of 57 rated horse-power, but running at 60, as stated. It runs with 90 pounds pressure, cutting off automatically, and making 280 revolutions per minute, from cylinders 9 by 16 inches. The proportion of the pulleys showed that the light generating electro-magnetic machines made 1,250 revolutions per minute. This makes the consumption of coal 3½ tons per week, which, at $3.50 per ton, is $12.25 for the cost of fuel per week. Two attendants are required, one to take care of the boiler and engine, and one to watch the 14 machines and lights; the pay of the two men is $33 per week. The consumption of carbons in the candles amounts to about 12 cents per light a night, which, for 14 lamps during 7 nights, is say $11.76. To this, which is all the direct expense, should be added the capital invested in machinery, which with wear and tear will be about 10%. The cost of the 14 magneto-electric machines is $400 each or $5,600; engine and boiler, $3,800; total, $9,400 or $940 per year, a saving over gas of about 80%, quite a large margin for accidents.

At the Mechanics' fair pavilion in this city, there is used at present a No. 7 Brush generator, supplying 16 automatic electric lamps, only 10 of which are used to illuminate the center nave of the building, which is 100 feet clear span by 441 feet long. The lamps are of 2,000 candle-power each, requiring a horse-power of 13½ for the 16 lamps, which may be increased to 20 lamps.

About 1,000 five-feet gas burners are required to illuminate this center nave to the same degree effected by 14 of the automatic electric lamps. In addition to the 16 electric lamps used in the pavilion, there are two more, located on the outside over the main entrance, supplied by a No. 4 Brush generator of 3½ horse-power. The cost of the 18 lamps is $1.40 per hour or 8 cents per hour each, which sum includes all the direct expense. The cost of the gas furnishing the same amount of illumination at the rate of $3 per M. would be $15 per hour, or at the Madison Square garden rate of $2 per M. $10 per hour or a little over 93% more than the electric light, taking the price of gas at San Francisco as the basis. In addition to the lights at the Mechanics' fair pavilion, provided by the California Electric Light Co., the Palace hotel is provided with 10 electric lights furnished from one No. 4 and one No. 5 Brush machine, using about 10 horse-power, replacing about 1,100 gas burners, all working to the satisfaction of the proprietor. It has been used in mines, particularly the Deer Creek mine near Smartsville, Cal., enabling the mine to be worked at night as well as by day. The practical results of the electric light on this coast, combined with the division thereof patented by Messrs. Molera & Cebrian of this city, show that we are fully up to the standard of energy in utilizing and perfecting useful and advanced appliances.



SANDHOLDT'S PATENT TAP AND FAUCET.

SAHARA RAILWAY.—The project of constructing a railroad across the great desert of Sahara has assumed the phase of a commission, which held its first meeting in Paris last July, and appointed four sub-commissioners, who will devote themselves to documentary data, technical studies, explorations, and international bearings.

Lunar Influence.

In our issue of Aug. 23d, we took occasion to allude to the popular fallacies concerning the influence of the moon upon terrestrial meteorology.

The article was suggested by the letter of Prof. J. P. Nichal, the eminent Glasgow astronomer to the Boston *Journal of Chemistry*. Since that article several communications have been sent the latter journal from persons who suggest that the attraction of the moon upon the earth's atmosphere may produce tides like those of the ocean, and that these may have a decided influence upon the weather. A correspondent in Florida writes as follows:

"While conceding the fact that the superstitious belief of the influence of the moon in mundane affairs, so prevalent throughout the world, is not only unscientific, but quite ridiculous, shall we ignore the influence of attraction which she exerts upon the waters of the world, heaping them in a tidal wave? And might we not suppose that the same influence would produce a similar phenomenon upon the atmosphere, causing a 'tidal wave' to follow her in her apparent daily revolution around the earth? These waves, like the tides, would vary each day according to the position of the moon in her orbit; and of course whatever influence they might have upon the atmosphere, that influence would be greater at the new and full moon, when acting in conjunction with the sun, than at intervening times. I have noticed for several years past that the frosts of spring and fall in the Northern States usually occur at or near the time of new or full moon, and I have attributed the cause indirectly to the influence of the moon upon the atmosphere by attraction."

A friend in Alabama writes in a similar strain, but more at length, and remarks in conclusion:

"That there is a certain coincidence between changes in the weather and changes in the moon is a fact which my own observations, extending over a period of more than 25 years, render it impossible for me to doubt. These observations have been conducted, it is true, only with the means provided by nature, including a very thin skin, and a nervous system which detects an 'east wind' before it has affected the weather-cock."

We have no wish to argue with those who insist that the moon does exert an influence upon the earth's atmosphere. The facts are that the variation in atmospheric pressure depending on the position of the moon is almost infinitesimal, and can be detected only by taking the mean of the most careful observations continued through long periods of time. At Singapore, in latitude 1° 18′, according to Prof. Loomis, the pressure when the moon is on the meridian is .0057 of an inch greater than when she is six hours from the meridian. At St. Helena, latitude 15° 55′, the difference is only .004 of an inch, and in higher latitudes it is still less. These results indicate a "tide" so slight as to be utterly insignificant in comparison with the atmospheric fluctuations due to other causes, and any influence it may have upon the weather is of course inappreciable. It can no more enter into our calculations or prognostications of the weather than the lunar heat, which, as we have said, is sufficient to raise the thermometer only one five thousandth of a degree.

From a careful scientific examination we are obliged to say that the same reasoning is applied to the moon as has been in the case of comets and other phenomena. Wars and pestilences have sometimes followed the appearance of comets and meteoric displays, which have been considered causes of the former, an ancient superstition not yet wholly eradicated.

DARIEN CANAL.—The scheme of De Lesseps, for cutting the Darien canal, seems to have been dropped for the present, the subscription books having been closed. The kindness of the French projectors in offering to dig this canal with American gold, and retain its control, has not been appreciated, and the lack of funds, combined with a plainly expressed American opinion, seems to have paralyzed any further advance in the matter, at least under the present auspices.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

El Dorado County Mines.

EDITORS PRESS:—The attention of capitalists willing to invest in mining speculations is now directed towards El Dorado county, and, at the present time, especially towards Greenwood. Much has latterly been written respecting the mining outlook in this locality, and it may not be out of place to carefully examine into and impartially report the condition and prospects of the several mines in the district. With your consent I will endeavor to do so, premising that I am an old miner and am not personally interested in any mines here.

It is well known that the neigbborhood of Greenwood and the Spanish Dry Diggings has very largely helped to swell the gross returns from the northern California mines ever since the days of the earliest golden discoveries. With the exhaustion of the alluvial deposits, in the ravines, gulches and tributaries of the American river, the mining population has gradually decreased, till the few left in the old mining camps are generally those who still have faith in the discovery of profitable ore deposits in the quartz ledges and mineral seams in the hills, and who have labored on prospecting for inducements to encourage capital to carry out their enterprises. With varying success this has been partially accomplished. There is little doubt that had a moiety of the capital and scientific skill that has been expended on the Comstocks, El Dorado county, traversed as it is with mineral belts, would to-day have been as prosperous and celebrated as ever Virginia City was in its palmiest days.

The first outlook that attracts the miner's attention on arriving here is the

Greenwood Seam Belt,

Which is distinctly traceable for a number of miles, and from which much of the wealth formerly obtained from the adjacent creeks and ravines doubtless had its origin. This belt is porphoritic and stratified, bearing northeast and southwest (having the same course as the most prominent quartz ledges), varying in width from 400 to 600 feet; the walls are well defined —slate on one side, porphyry and gypsum on the other, the ground when opened presenting innumerable fine quartz seams, running in every direction, almost in cubes, but in depth these seams appear to be all converging to a common center. The ground, besides occasional rich pockets, contains an average distribution of free gold and rich sulphurets in considerable quantities.

The French Claim,

Located on the confines of the town site, is the most fully developed. It has been worked for many years and has produced upwards of $2,000,000. It has been worked under the great disadvantage of poor dump facilities and too light a grade to carry off the debris. The tailings have been accumulated on the hillsides, at much extra labor and expense, and as much of the cement is washed out in its normal condition, in due time it will again be profitably worked, both for the gold and rich sulphurets therein contained. The last clean-up in this claim (last week), for a run of five days, returned 12½ pounds of pure gold, worth $19 an ounce.

West of north along this belt are the Johnston & La Shantz, the Oakland, Union, Spanish and Bower mines. The two former of these are being opened, and will shortly be heard from. The Union and Spanish are at present lying idle, on account of some controversy as to title; and the

Bower Mine,

A more recent location, is being quietly, but methodically opened by an Eastern company, formed by Mr. Bower, the locator, and is worthy of special attention, as it will most probably be the cause of renewed activity along the entire belt. It is located where the belt is intersected by the American canyon, a deep gorge running from Greenwood to the American river, forming an outlet for dumping and reworking the tailings not afforded elsewhere, for which purpose the company have wisely located a claim of 3,000 feet of the canyon below. The area of the claim contains some 40 acres of the belt, part of which is a basin on Frazer's flat, the surface of which has heretofore been partially and imperfectly worked with great profit, but for want of fall bad to be abandoned. The entire surface in this basin prospects gold more or less to every panful. The company are running a tunnel from the side of the canyon to this basin, and are now in 450 feet, with a distance of 150 feet more to run, when they will raise a shaft some 87 feet to the surface and wash through the shaft and tunnel. The latter is run on a sluice grade of 14 inches in 12 feet, and when complete will contain a flume two feet wide, and drop into the canyon, the natural advantages of which will be aided by mechanical skill in a system of flumes, drops, etc.; and the accumulation of tailings from the summer's work, slacked by exposure to the elements, will be easily and economically worked in the winter, with the abundant supply of free water incident to the topography of the location during the rainy season, a system of undercurrents and other appliances being used to concentrate the sulphurets, and thus, by the combination of nature and art, thoroughly work, at comparatively trivial cost, the debris for all it is presumably worth. Certainly the Bower mine gives very flattering prospects to the enterprising company, both for a speedy return of their outlay and a permanent and profitable mine.

As I am exceeding the limits of a letter, I will postpone my remarks on other mines for the future. D.

Greenwood, Aug. 26th, 1879.

Tybo, Belmont and Austin, Nevada.

EDITORS PRESS:—From Eureka south, away for 90 miles along extended valleys, between towering mountain ranges, skirting rolling, desolate hills, through dry, worthless sage brush regions, with but three green, grassy or even weedy spots an acre in size the whole distance, and the traveler turns square to the right, straight into the lofty range over a mile up a sharp, narrow, rocky defile to a mining town called Tybo. It is a crowded line of buildings of odd styles of architecture along a single street, or possibly a second in a place or two, so pressed for space is the whole between precipitous, craggy mountains, rising over 1,000 feet high, yet so ruggedly grand we never tire in looking at them. Here an active mill and successful mine gives employment for a population of some 500 people, a good proportion being families. The enterprise is called the Tybo Con. mining company—President, Mr. English; Superintendent, Mr. Hawkins; Foreman, Mr. Nowell. We went through the mine and everything appeared well, prosperous and sure for a score or two of years to come. The vein averages four and one-half feet thick, clearly defined by walls dipping to the north at an angle of 60°, very uniform in richness, mined 1,000 feet deep, and being stoped out near 900 feet in length. The company has smelted all its ore for some seven years past; but five months since they effected a change to that of dry crushing and find it a decided success.

Other claims are also being opened in the immediate vicinity with excellent prospects; the one appearing to us the best being that of the Gilmore Bros. Their vein is clearly marked, rich, and rapidly widening, though opened as yet to a very limited depth. On our way we passed two important mining points, not sufficiently developed, however, to justify our spending a day to visit them. The first was called Moray, four miles off the road to the west at the foot of a mountain of the same name, the highest, grandest, most rugged in the region. The other is Hot Creek, where the materials were just arriving for a new 10-stamp mill, designed to develop a number of mines in the vicinity till now lying idle.

We found at Tybo, as usual, many old friends of the PRESS, and took many new names of those who desired to receive it. From here 35 miles west, a little north, took us over two high ranges and across a wide valley to Belmont. This is an old and once famous mining locality. It may again become all it ever was or much more. Its principal claims are the Belmont, Highbridge, Moniter and El Dorado, while others are waiting development. The first alone, just at this time, is being worked, the others all being, for causes known to themselves or their owners, closed; the Highbridge stopping only the day before our arrival.

We were told as to the Belmont that strict orders have been received to admit no visitors into the mine, yet as we went through the mill, examined the piles of vein rock, and made various inquiries, our impressions were decidedly favorable as to the permanance and real value of this mine, and also to others near it, if only the owners could harmonize their views, and go vigorously to work in sinking deeper their shafts, and developing more fully the veins. Still, if all visitors are excluded it is not well for the agent of the MINING AND SCIENTIFIC PRESS to give a very decided opinion as to their claims. Still, we do expect them again to become of great value in their yield of the precious metals.

The town is the county seat of Nye county, and is really a pleasant place, with fine court house, public school, two church buildings, and six really ornamental, irrigated, green grassy dooryards, a real beauty in the desolations around.

From Belmont over the Range west, then 70 miles north along Smoky valley, then again over a range west, and we came to one of the early, regularly laid out, prosperous, and respectably-looking mining cities of the State named Austin. Its one large milling company called the Manhattan, known the world over for its successful operations, appears to be carrying steadily forward its enterprise, developing its own numerous mines, and reducing all the ore which other miners in the regions bring it. They have an excellent mill, sparing no pains to secure the best of machinery, and do their work well. They have the admirable air compressor advertised in the PRESS on the last page, from the mining depot of Parke & Lacy, the very one exhibited at the Centennial. The Eureka Con., at Eureka, also has one of the same kind and all speak well of them.

The Austin mines consist of innumerable small veins of excellent pay ore running nearly parallel, from one inch in thickness up to, in rare cases, two and one-half feet. Thus the labor of getting out the rock is often very costly. Yet when the rock is out, it has often yielded hundreds of dollars to the ton, up even to $2,000 or $3,000 or more. The mines may last for ages and not be exhausted.

The town has many houses, well built, and ornamented with fine trees and irrigated yards in true civilized manner. One street might well be called Locust, so well is it shaded by this pleasant exotic. Its court house, Methodist, Roman and Episcopal churches are large, fine brick buildings, each with good bell and completely furnished. Besides these there are also many private buildings and business houses of brick, as well as many well-framed and neatly painted dwellings. The rougher peculiarities of a mining town are steadily disappearing from Austin, and the features of true civilization are taking their place. A good railroad, now projected from Battle Mountain to this place, would greatly help to render it a place desirable for permanent residence and would add much to its business. Its view to the west is an extensive and most varied scene across Reese River valley to hills, mountains and ranges commingling beyond, 20, 40 and 60 miles away. On the east, the immediate hills raise their summits to the lower clouds, and form a grand background to the city. Well may Austin be admired for its improved and natural features.

S. V. B.

Mines in Southern Utah.

Dr. J. S. Newberry, in the Salt Lake *Tribune*, gives the result of his observations in southern Utah. He finds very interesting features in that Territory. He pronounces the Tintic district the most interesting of all, and one that promises to be permanently productive.

The most important mines yet opened there are located on a great north and south vein, which have been traced and worked for a length of more than a mile. The mines situated on this are: The Eureka and Sunbeam on the north; the Crismon Mammoth, in the middle, and the Copperopolis on the south. This is a true fissure vein, cut through massive limestones across their bedding, and although exhibiting considerable variations in dimension and composition, gives every indication of being continuous and productive to a great depth. At the south end of the Crismon Mammoth property the croppings of the vein are nearly 200 feet wide, but it is here like the Comstock, divided by several horses of the country rock. Below it is more concentrated and shows what may be regarded as a normal thickness of from 40 to 60 feet. In its northern and southern extensions this vein is not as large, and of somewhat different composition, being relatively richer in silver on the Eureka, in copper on the Copperopolis. It everywhere carries copper, lead, silver and gold; the gold being most abundant, so far as we can judge from present developments, in the Crismon Mammoth, from which a considerable quantity of gold ore of extraordinary richness has been taken, assays being reported as high as $80,000 to the ton, and specimens taken from the mine by him, assayed $40,000 to the ton. Dr. Newberry is careful to say that the quantity of this rich ore is small.

The ore of the latter mine, however, contains about twice as much gold, in value, as silver; but the mine also holds great quantities of copper ore that will run from 12% to 20%. At present the chief product of the mine is gold, but little of the silver being utilized, and the copper entirely neglected. The ore is what is termed in this country "rebellious," and requires for its proper treatment a somewhat complicated metallurgical process.

The Doctor finds defects in the processes of extracting the precious metals, and says that the true interest of the district require the introduction of other methods of treatment. In the Sunbeam the unoxidized ore is mainly gray copper (tetrahedrite) with considerable iron pyrites, carring much more silver than gold. This is treated, and it is said successfully, in combination with other ores, by the leaching process at the Ely mill, and there are several other mills in the vicinity in which the Tintic ores are worked by the ordinary almagamating process.

Probably the best results would be obtained by matting the ores, as fuel is cheaper here than almost anywhere else in the Territory, wood costing but $2 per cord, and the composition of many of the ores being especially adapted to this process.

Another mineral belt in Tintic runs in an easterly direction from Silver City. It includes the Julian Lane mine, remarkable for the bismuth silver it contains, and some other interesting mines in its vicinity, with an extension eastward of silver-lead ores, apparently along the line of contact between a broad dike of rhyolite "porphyry" and a ledge of quartzite. The mines appear at great disadvantage, having been irregularly worked.

The Eureka Hill has lately yielded considerable high-grade ore.

The Copperopolis is now closed, the low price of copper, its chief product, making it unprofitable working. Better methods of working must be adopted.

The Frisco district attracts Dr. Newberry's attention, and he pronounces the Horn Silver mine as the richest mine known in the world, that is, the mine in which the largest amount of ore, and that of the greatest pecuniary value, can be demonstrated to exist. The mine is located on a true vein, which occupies the line of contact between trachyte on the east and limestone on the west. The limestone wall is remarkably regular and well-defined, both on the property of the Horn Silver company and the extensions north and south. The hanging wall has, however, been generally removed along the outcrop, and replaced by wash from the hills. The mine recently caved in and rendered some portion of the ore body inaccesible. The extent, laterally and vertically, of the Horn Silver ore body, has not yet been ascertained. It has been penetrated by the subterranean workings about 300 feet laterally and vertically. Careful measurements made by Mr. Hooker, part of which were tested and confirmed by Prof. N., show that the ore body extends at least 300 feet along the horizon, and to the depth of 300 feet from the discovery, with an average thickness of not far from 50 feet. This would give about half a million tons of ore, independent of what may lie below the lowest workings, or north and south of explorations yet made.

Working results indicate that $50 per ton is about the proper assay. If we accept this and also the fact that half a million tons of ore are now at hand, we must assign a gross value of something like $25,000,000 to the ore in sight. The expense of turning this into money would not exceed $25 per ton, leaving a net profit of about $12,000,000. About 40% of lead would be the average tenor of the ore, and 200,000 tons of lead would be produced valued at Frisco at $25 per ton, making $5,000,000.

So far as yet penetrated the ore of the mine is mostly soft sulphate of lead, with some portions, which are harder, of sulphate of haryta. Scattered through the vein are small masses of horn silver, from which the mine takes its name, and in the harder portions may be seen streaks and lumps of ruby silver, usually coated with chloride, the result of decomposition.

The Carbonate mine two miles north of Frisco is a true fissue vein from 12 to 15 feet wide in walls of trachyte. In general features it closely resembles the famous Bassick mine of Rosita, Colorado, except that in the latter the ore which cements the pebbles consists of tellurides of gold and silver, with the sulphides of copper, galena, zinc and iron, and is much richer.

The Cave mine situated in the Lincoln district 22 miles east of Frisco, is situated in a limestone mountain, and the ore fills galleries and chambers dissolved out of the limestone, precisely as in the Little Cottonwood district, and at Eureka, Nevada. But the ore seems to be more continuous than in either of the localities cited. The mine takes its name from caverns which were never filled with ore, and now present the appearance of ordinary caves in limestone rock. The ore of the Cave mine consists mainly of soft hydrated oxide of iron (limonite), containing on an average about $30 to the ton in silver and gold. It is the best flux for the lead ores of this region known. Silver Reef was not visited by Dr. Newberry owing to excessive heat and dust, but he considers the reports of the district as very exhaustive.

CAUSES OF INJURY TO CABLES.—The teredo has been very destructive in its attacks upon the gutta-percha coating of sub-marine cables. Sharp-toothed fishes have often interrupted the communication between Cayenne and Para. Turtles have attacked the wire from Key West to Havana. A whale broke the cable in the Persian gulf, and lost its life by getting entangled in the wire. Lightning has destroyed one or two of the Mediterranean cables. In some places sub-marine currents have worn out the cables by friction against the rocks; in others they have broken by their own weight in spanning ocean valleys. The attacks of insects have been partially overcome by mixing poisonous ingredients with the gutta-percha.

NEVADA COUNTY BULLION.—The following mines of Nevada county, California, have made reports of their bullion yield for the month of July, as published herewith: Deadwood (quartz), $6,100; Idaho (quartz), $29,300; Milton (gravel), $50,500; Murchie (quartz), $5,000 North Bloomfield (gravel), $28,900; Pittsburg (quartz), $7,900. This is only about one-half of the bullion product for this section for the month of July. Some 20 or 30 different companies hereabouts refuse to give information of their clean-ups. We know of three companies, not mentioned in the above list, who sent bullion to San Francisco during the month of July aggregating upwards of $30,000.—*Transcript.*

GOLD IN SOUTH AMERICA.—In French Guiana gold digging commenced in 1856; and in the next six years about 13,120 ounces of gold were procured. A few years later the Dutch settlers began to work in the gold fields in their colony, and in the next two years ending 1867, gold to the value of £25,000 ($125,000) was exported to Amsterdam. It is reported from Surinam and Cayenne that rich veins of gold have been found simultaneously in several parts of the auriferous area. One man, it is stated, in four week gathered upwards of 40 pounds weight of gold, with little labor, and similar instances of the abundance of the metal are numerous.

FOR the information of the New York *Mining Record*, we desire to say that from information the Emigrant silver mining company, of Lee district, Inyo county, Cal., has yielded $90,000 in bullion and levied two assessments.

MECHANICAL PROGRESS.

Improved Refrigerating Apparatus.

The export of fresh meat from this country to Europe has led to the invention of a number of processes for keeping the meat cool during the voyage. The most simple, and, so far, the most successful process, consists in making an air-tight chamber in the steamer, pumping air by means of a fan and special engine, through a series of pipes packed in ice. The air is cooled to about 35° Fahr., and is deprived of its moisture by condensation in passing the pipes, and the meat is preserved perfectly so long as the supply of ice holds out and the fan is kept in motion. An improved process recently announced dispenses with the use of ice and accomplishes equally good results, with only a moderate expenditure of power. The new method is founded on the simple fact of the heating and cooling of air when compressed and allowed to expand. A meat chamber of any convenient shape and size is fitted up, and near it is placed an air-compressor driven by steam power. The first result obtained is a heating of the compressed air, and to get rid of this heat, a spray of cold water is let into the chamber containing the compressed air, at each stroke of the compressor. This lowers the temperature to that of the cold water, and by an ingenious system of flue grating, the moisture that saturates the compressed air is extracted. The air is passed through a series of finely perforated discs, on which a large proportion of the water is caught and allowed to pass away through suitable valves.

Within the meat chamber are arranged a series of pipes hung up in zigzag form (probably straight pipes joint by return-bends), and the compressed air is allowed to pass through these, still farther chilling it and removing by condensation the remaining moisture. It then passes to the cylinder of an engine and is there allowed to expand in driving the engines. The exhaust air is then taken by pipes into the meat chamber, and there allowed to expand to atmospheric pressure. The engine is also coupled to the steam engine that drives the compressors, and thus the air in expanding performs a part of the visible work of compressing. By this ingenious process the air is cooled three times and enters the chamber, not only dry, but very cold. There is less waste of power by this process, and a far lower degree of cold and a freedom from dependence on ice. By taking the air for compression from the chill-room, a still lower temperature may be obtained, and by joining one apparatus to another, there is apparently no limit to the lowering of the temperature of the air. The practical limit is found in the freezing of the lubricants used in the engine that is driven by the compressed air. Oil is frozen solid and stops the engine, and in practice it is found that glycerine must be used, and here the process stops, for, if the chilling and rechilling is carried farther, the glycerine must freeze, and the engine will be unable to move. The process has been kept in operation for three months without stopping, and has proved to be entirely practical and satisfactory, and will undoubtedly soon be tried on steamers making long voyages.

New Carpet-Weaving Machine.—A syndicate of five English carpet firms, according to the Manchester (Eng.) *Guardian*, have purchased the patent rights for an ingenious carpet-weaving machine invented by an American, which enables them to produce a carpet—a velvet pile, in appearance and quality said to be a most luxurious article—at a very low cost, which they have named the Royal Axminster. The machinery is said to be very simple, occupying only half the space of the ordinary carpet looms. The worsted yarns forming the face of the carpet are wound from ordinary bobbins on long bobbins the width of the carpet, the colors being arranged by a comb as the pattern requires. The ends are passed through metal tubes for delivery, and the bobbins in proper sequence are then fixed on an endless chain over the loom. As this chain revolves, metal clips seize each bobbin in turn, take it off the chain, and dip the ends of worsted among the warp threads of the carpet. Here they are at once firmly fixed, and a circular knife cuts off the worsted at a proper level. The bobbin is returned to the chain, and the succeeding one dealt with. Women are now working the looms successfully and earning good wages. The process is considered likely to revolutionize the trade in Axminster carpets.

Hop-picking Machine.—An ingenious labor-saving device for picking hops has recently been invented, the arrangement consisting chiefly of two rubber rollers, so constructed as to draw in the branch of the vine, while two steel rollers, having an opposition action, pick the hops from it. The machine is about the size of an ordinary wringer of clothes, is propelled by means of a treadle, and runs as easily as a light sewing-machine. From the picker the hops run into a sack, and this, when filled, is taken to a separator, which sorts the hops from all leaves or stems which may have gone into the sack, and from thence to the hop-house. The apparatus is estimated to pick as many as 20 to 30 boxes per day; and one separator is ample for a large number of the machines.

Large vs. Small Vehicle Wheels.

George A. Hubbard in a recent number of the *Scientific American* speaking of the relative amount of power required to move a given weight upon wheels of a certain size or diameter, and the amount required to move the same weight on wheels of double the size or diameter, says that the power required by the large wheel was represented by 22½ pounds, and that required by the small wheel, of only one-half the size, by 33¼ pounds, or in round numbers, as two is to three. Mr. Prosser in the *Western Manufacturer*, questions the accuracy of these conclusions, and states that his experiments "show very conclusively that the power required is inversely as the diameter of the wheel, except the friction of the axle, which is a constant quantity in both, so far as starting is concerned. But even that becomes inversely as the diameter when equal distances are passed over by each wheel." Speaking on this particular subject, Sir Thomas Tredgold remarks on page 341, Vol. V., of Engineering Facts, that it seemed quite clear to him, that "as far as the friction of a wheel is concerned, if you double the radius of the wheel, you reduce the power necessary to move the carriage one-half," and expresses his astonishment that this truth, although repeatedly published in that country had been overlooked. To confirm his idea, he instituted a series of experiments, the result of which showed that the small wheel required 1-59 of its weight, and the larger wheel, which was double the diameter of the small one, only 1-113 of its weight, thus showing conclusively that when the constant frictional quantity represented by the load on the axle is deducted to an extent of say 5-100, as it should be from the smaller wheel, which requires two revolutions to equal one of the larger, it leaves the ratio of power required inversely proportional to the diameter of the wheels.

Application of Electricity to War.—It is now proposed that the officers undergoing a course of torpedo instruction on board the *Vernon*, at Portsmouth, shall also be required to familiarize themselves with the practical application of electricity to the art of war. The teaching element has not as yet been perfected, but proper instructors will, no doubt, be provided in course of time. Steam was got up in the *Dreadnought* on two occasions, and the first lessons in the production and management of the electric light were imparted. The turret ship is provided with a couple of lamps placed at each end of the flying deck, the current being generated by one of Wilde's electro-magnetic machines, the motive power for which is supplied by a strap from the forward ventilating engine. The illumination is produced by a couple of vertical carbon points, which are worked by hand. There is no subdivision of the current, so that only one light can be used at a time. Until lately, however, the after light could only be obtained by disconnecting the forward one and forming a new and separate connection with the commutator between decks. This method not only entailed great loss of time, but was attended with great difficulty. Now, however, an important improvement has been introduced, by means of which it is only necessary to shut off the forward connection, and the after light may be used at once. Some experiments have also been made with the Gramme machine on board the *Bloodhound* and a torpedo boat.

Transformation of Sound into Light.—M. Coulon, conservator of the Industrial Museum of Rouen, has discovered a new system for transforming sound into light, which phenomenon has been the subject of a lecture at the Salle des Capucines by M. Frank Geraldy, with the Gower telephone. Two Geissler tubes are put in quick rotation on an axis. The Ruhmkorf coil of the first is worked by an ordinary interruptor and gives the deviation of a luminous cross. The interruptor of the second is replaced by a telephone. The figure presented by the second tube projects on the first one, which is colored by uranoxide glass and exhibits the most rapid changes according to the hight of the note delivered in the telephone trumpet. The sensibility of the changes are startling and most interesting. An exhaustive lecture by M. Coulon will be given at Rouen in a few days, and the apparatus exhibited at the Palais de l'Industrie.—*Iron*.

Hemp-Softening Machine.—The Mohawk and Hudson Manufacturing Company, of Waterford, Massachusetts, has recently built and shipped to the hemp region in Kentucky, a hemp softening machine, which is believed to be the largest and heaviest in the country. It has two fluted rolls. The lower one is 12 inches in diameter and 6 feet long. The upper one is 24 inches by 6 feet. The lower one is driven by gearing from the back shaft, and in turn it drives the upper. The shafts are 6 inches in diameter. The upper roll and shaft weighed about 8,500 lbs., and the complete machine about 15,000. Other hemp-softening machines have been built at these works, but none as large and heavy as this.

American Engines.—Locomotives of American manufacture are rapidly conquering those of European make in economy and favor. They are much less in cost than English engines in South America and Russia, and are gaining in favor.

SCIENTIFIC PROGRESS.

Negatives on Paper.

The success which has followed the practice of the gelatino-bromide process and the easy character of its manipulation have revived, says John Nicol, Ph. D., in the *British Journal of Photography*, the desire for a substitute for glass as a support for the sensitive film. The Rev. H. J. Palmer has already shown good work on a gelatine film, and several operators have been more or less successful with various substances; but we want something simpler and less troublesome before glass can be dispensed with. One of our successful northern amateurs is at present getting pretty good results on simple paper. The kind he at present prefers is known as letter-book paper—a variety extremely thin but tough, and with a perfectly smooth surface. A roll of this, slightly damped, is laid on a perfectly level board a little narrower than itself, and the edges folded over and fastened with gum to keep it flat. The emulsion is poured on and spread with a glass rod in the ordinary manner. When dry it is cut into suitable sizes and exposed between plates of glass, as was the case with waxed paper. So far the results are promising, and I have little doubt that some such arrangement will ultimately be found in every way satisfactory for all outdoor work. It is probable that a previous coating of rubber in benzole, as suggested by me a number of years ago, might be an advantage by keeping the emulsion on the surface. Should simple paper be found to answer, as I have little doubt it will, some of our enterprising manufacturers will soon be sending it into the market in rolls similar to carbon tissue, as it may be made by the same apparatus and in exactly the same way by simply substituting the sensitive emulsion for the pigmented gelatine. In addition to the advantages of lightness and non-liability to break, there will be the further and, to many, great advantage of reduction in cost. The price of glass is altogether saved and the labor reduced to a minimum, a band of several yards being coated in the most perfect manner in a few minutes. I hope to return to the subject again as the experiments of my friend proceed, and trust that, meanwhile, other workers will turn their attention in this direction, as the greater the number who put their hands and heads to the work the sooner will the desired end be accomplished.

Applications of Steam Engine.—John Bourne, C.E., London, in his pamphlet entitled the "Steam Engine of the Future," says: "The application of the steam engine to the propulsion of carriages, omnibuses, and cabs, is now only hindered by its too heavy weight and too high cost. Asphalt pavements, which are objection able for horses, afford for steam carriages a surface as eligible for easy traction as a railway, and without any countervailing fault. All wheeled vehicles, whether required to travel at a high or a low speed, will be propelled by steam instead of horses as soon as the steam engine is made efficiently light and sufficiently cheap to warrant the substitution. Life boats, instead of being open boats propelled by a number of men, should be decked boats propelled by a steam engine, and managed by only two men, one to steer the boat and the other to attend to the engine. Such boats should be propelled by a water jet which will always act, whatever may be the roughness of the sea, and whether the stern of the boat is in or out of the water. The use of the steam engine for irrigation in connection with the centrifugal pump is an application of which the sphere is limited only by the cost and the deficient portability of the apparatus. To render the class of small engines so much more portable, so much more simple, and so much less costly as to remove the existing impediments to their use, may certainly be accounted one of the most important problems of the present time.

Curiosities of Earth.—At the city of Medina, in Italy, and about four miles around it, wherever the earth is dug when the workmen arrive at a distance of 63 feet, they come to a bed of chalk, which they bore with an auger, five feet deep. They then withdraw from the pit before the auger is removed, and upon its extraction the water bursts up through the aperture with great violence, and quickly fills the newly made well, which continues full and is affected neither by rains nor drouth. But what is the most remarkable in this operation is the layer of earth as we descend. At the depth of 14 feet are found the ruins of an ancient city, paved streets, houses, floors and different pieces of mason work. Under this is found a soft, oozy earth made up of vegetables, and 26 feet, large trees, with the walnut sticking to the stem, and the leaves and branches in a perfect state of preservation. At 28 feet deep a soft chalk is found, mixed with a vast quantity of shells, and the bed is 11 feet thick. Under this vegetables are found again.

Economy of Electric Carbons.—M. Delanrier says that by guarding the poles of the electric circuit from air currents, an atmosphere of carbonic acid may be formed around them, which prevents useless waste and greatly diminishes the cost of lighting by electricity.

Lord Derby and the Arctic Expedition.

The projected Arctic expedition for the discovery of the North Pole will, in all probability, leave England in the spring of 1880. By the exertions of Commander Cheyne, a London Arctic Committee has been established at the head of 49 other committees throughout the country. Commander Cheyne is endeavoring to secure the patronage of Lord Derby and other eminent noblemen and scientific gentlemen, and a memorial to this effect will be presented by a special committee of ladies, as well as by the Central Committee. The various committees will be asked to enter upon the work of collecting subscriptions. The expedition will co-operate with those sent out by Sweden, America, Holland, Austria and Denmark.

The following letter has been sent by Lord Derby to Captain Cheyne, Commander of the new Arctic expedition: "23 St. James' square, S. W., Aug. 1st, 1879. Dear Sir: Having heard your scheme of a new Arctic expedition fully explained in conversation to-day, I have the pleasure of promising a contribution of £100 in aid of it, should you succeed, as I hope you may, in obtaining support to justify you in going on with it. I remain, faithfully yours, Derby." Captain Cheyne, R. N. Mr. Puleston, M. P., is Secretary of the expedition fund. —*Liverpool Weekly Courier, Aug. 2d, 1879.*

A Rival of the Electrical Light.—An intensified gaslight, by some called the "albo-carbon light," is attracting considerable attention in England at present. Its special advantages are that it economizes the consumption and improves the quality of the gas, and involves no change in mains, meters or piping, or the general apparatus of gas service. It is also claimed by the patentees that albo-carbon causes no obstruction and leaves no residuum; and that the evaporation of the substance under heat is so thorough that vessels in which it is used may be replenished without any fear of accumulating deposits. A variety of interesting photometric tests were recently applied to this light at an exhibition in London; and one of the most pleasing effects produced was that of its hue, which was cheerful and sunny as well as intensely brilliant; and the shadows cast by objects within its range were of a subdued tone quite different from the intense darkness that contrasts so unpleasingly with the moonlight brightness of the electric light, which requires at present for its production elaborated machinery not needed in connection with albo-carbon. This substance, used as an adjunct to gaslight, imparts to the latter a warm, sustained and steady light, that does not, in spite of its strength, fatigue or discommode the eye. As employed as an auxiliary to common gas, the improved light consists of some properties of pure white carbon in the solid form of small cylinders, having much the appearance of sticks of pure white candy. The apparatus required to adapt the feeder and enricher to an ordinary gas-burner is so simple that it demands a management no more skillful than that needed to fill and trim a common table lamp.

Electric Light Telegraph.—Mr. F. Peppard, of Basking Ridge, U.S.A., while using a small vibrating electric light, conceived the idea of making and breaking the circuit by means of a finger-key or commutator, and of employing this intermittent light for flash-signaling. When the current is on, if the key be touched, at each depression it makes a corresponding flash in the light, which can be seen and read miles away—in fact as far as the light can be seen; in this way each letter of the alphabet can be flashed out, the flashes taking the place of the dots and dashes in the Morse system. For government or private use, a secret system could be used which could be read only by those holding the key to it. The advantage to the Admiralty of giving secret orders to officers who may be miles away, and which can only be understood by them, would be invaluable for war-vessels, forts, etc. The garrison of a fort could attach a light to a very small balloon, and send it up a few hundred feet, and flash out its despatches, which could be seen and read as far as the light could be seen. The light used is of a vibrating kind, with an armature that will give instantaneous flashes, and the cost of an apparatus sufficient to produce a light which may be seen for many miles does not exceed $100.

New Pendulum Experiments.—M. Dejean de Fouroque has experimented with a pendulum, vibrating in a large arc and free to move in all azimuths. He finds that the plane of oscillation tends rapidly to assume a special direction, which is, according to his views, the horizontal projection of the earth's trajectory, or, in other words, the resultant of the two great movements towards the constellation Hercules and around the sun. The path traverses the meridian four times a day, and the hours of crossing vary with the position of the earth in the ecliptic. M. A. Corwin has witnessed the experiments and reported them to the French Academy. Although he hesitates to adopt Fouroque's conclusions with regard to the cause of the movements, he thinks them so interesting and important that he recommends them to the careful study of physicists and geometricians.—*Comtes Rendus.*

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Aug. 14		Week Ending Aug. 21		Week Ending Aug. 28		Week Ending Sept. 4.	
Alpha	24¼	22½	25	23	25½	23½	25¼	23¾
Alta	6¾	6½	7¼	6½	6¾	6½	6⅝	5⅝
Andes	1.30	1	1.15	1	1	90c	1	90c
Alps	....	....	....	....	....	....	....	....
Argenta	1¼	1	1.05	80c	1	90c	80c	75c
Atlantic	....	....	50c	40c	....	....	....	....
Aurora Tunnel	....	....	....	....	....	....	20c	....
Baltimore Con	....	....	....	....	50c	....	50c	....
Belcher	4.65	4	4¾	3¾	4.85	4½	4.65	4½
Belmont	95c	70c	95c	90c	75c	60c	85c	65c
Best & Belcher	18½	18	19	18	19½	18¼	18¾	18
Bullion	7	6	6⅝	6½	7⅝	6	8½	7¼
Bechtel	1.60	1½	1½	1¼	1.30	1¼	1.30	1¼
Belle Isle	3.70	3⅛	4	3.55	4.30	3¾	4.45	4.30
Bodie	11¾	10	11⅝	10¾	11	10½	10⅞	10
Benton	4.15	4	4⅛	3.70	4	3.80	3.90	3½
Bulwer	9¼	9	9	8½	8½	....	9	8⅝
Boyle	....	....	....	....	....	....	....	....
Black Hawk	1.60	1.30	1.30	1¼	1.10	1	1.05	1
Belvidere	1¼	90c	1½	1	1	75c	75c	....
Booker	1¼	1	1.20	1.15	1.35	1.15	1.20	1
Caledonia	2.30	2.05	2¼	2	2	1.70	1.95	1.85
California	5½	5	5⅛	4½	4.80	4.60	4.95	4.80
Challenge	2.60	2¼	2.60	2¼	2.30	....	2.40	2
Chollar	7¼	6¾	7	6	7¼	6¼	7	6¼
Confidence	12¼	11¼	11¾	11	11½	10	11	10¾
Con Imperial	1.55	1.30	1.60	1.40	1.55	1.40	1.70	1.45
Con Virginia	5⅜	5	4¾	4.55	4.85	4.60	4.85	4¾
Crown Point	4.80	4½	4.70	4¼	4.35	4	5.80	3.70
Con Washoe	55c	50c	75c	55c	1.05	75c	....	....
Champion	50c	40c	50c	40c	50c	45c	45c	40c
Concordia	....	....	....	....	....	....	10c	5c
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	30c	....	....	....	25c	....	10c	....
Eureka Con	15	14½	16	14¾	16¾	16½	16¾	16
Exchequer	6⅞	6	6⅜	6⅛	6¾	6	6⅞	6¼
Endowment	....	....	45c	....	40c	....	50c	45c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	4	3.90	3.90	2.90	3.80	2.60	3.55	2¾
Gila	1½	1.30	1½	1¼	1.10	50c	55c	50c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	14	13	13¾	13	12¾	....	....	....
Goodshaw	55c	25c	45c	....	45c	40c	50c	40c
Gould & Curry	11⅝	9¾	12½	11¼	12½	11½	12	11⅛
Hale & Norcross	14½	13½	14½	13¼	15¼	13¾	14⅞	14
Hillside	1	....	1.40	1	1½	1¼	1.60	1½
Highbridge	....	....	....	....	....	....	5c	....
Homestake	....	....	....	....	....	....	....	....
Hussey	15c	....	15c	....	10c	5c	5c	....
Independence	2.90	2.35	2.60	2.10	2.20	2	2.15	2.10
Julia	5	4¼	4.55	4.10	4.35	4.05	4.40	4.15
Justice	3½	3.35	3.65	3.10	3⅛	3	3	2.60
Jackson	4½	4¼	5	4⅛	5	4¾	....	....
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	1	....	1	....
Kentuck	5⅛	4.45	5	4½	4¼	4	4¼	4
Kossuth	25c	....	....	....	....	....	20c	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	1.05	80c	1	65c	60c	50c	60c	55c
Lady Wash	1.35	1.15	1.30	1.10	1.20	1.10	1.20	1.05
Leopard	1.20	1	1	40c	60c	30c	40c	30c
Leviathan	45c	25c	40c	25c	25c	....	30c	25c
Leeds	75c	....	75c	70c	....	....	70c	65c
Lee	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	25c	....	25c	....
Modoc	1	....	1¼	1.15	1.10	1	1¼	1
Manhattan	2	1¾	3	2	3	2¾	3	2¾
Martin White	4	3	3.70	3	3¼	2½	2.20	2
McClinton	1	70c	1	75c	1	75c	1	70c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	32¼	27	36¾	32	35	32¾	35	33½
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	3	....	3.15	....	....	....
North Con Virginia	9	....	9⅛	9	8½	....	8	7¾
New York	90c	75c	90c	70c	70c	60c	90c	55c
Northern Belle	4.40	4	4½	4	4	3.95	3¾	3½
New Coso	....	....	....	....	....	....	....	....
Navajo	35c	25c	30c	....	35c	25c	30c	25c
Occidental	2	1	1.55	1.30	1.40	65c	1	75c
Ophir	37	35	38	35	37	35½	36¾	35¾
Oriental	70c	35c	70c	35c	40c	35c	40c	30c
Overman	9½	9	9¾	9	9	6¼	9	8¾
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	....	....	1¼	....
Phil Sheridan	70c	50c	60c	40c	....	....	40c	....
Potosi	5⅜	4.60	5⅛	4.70	5⅛	4¼	5½	4.85
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	3¾	3	3¾	95c	90c	65c	75	65c
Richer	50c	30c	25c	10c	20c	15c	40c	15c
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	75c	55c	45c	....	....	....	....	....
Savage	13¼	12½	14	12⅝	12½	12¾	15	14¼
Seg Belcher	25	23	....	....	14	....	24	23½
Sierra Nevada	45¼	40¼	49½	39¼	42	39½	43¾	41¼
Silver Hill	1¾	1½	1¾	1.60	1.65	1½	1.60	1½
Silver King	6	5½	....	....	5	4	....	....
Silver Prize	20c	....	25c	10c	20c	....	15c	10c
Succor	....	....	....	....	15c	10c	15c	10c
Summit	2	1.65	2	1¾	1.80	1¾	1.70	1⅛
Scorpion	2.50	2	2.95	2.40	2¾	2.30	2.70	2½
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	20c	15c	35c	10c	35c	30c	30c	....
South Standard	15c	....	15c	10c	15c	....	5c	....
Star	50c	40c	45c	40c	....	....	45c	40c
St. Louis	....	....	....	....	30c	....	....	....
Syndicate	6	5⅛	6¾	4½	7	6¾	6¾	5⅞
Tioga Con	4.05	3.90	3.95	3½	4	3.55	3.55	3.45
Tiptop	1.05	95c	95c	....	....	....	90c	75c
Trojan	30c	5c	30c	25c	30c	....	30c	25c
Union Con	53	45	67½	47½	57½	50	62½	55½
Utah	19⅞	13	22½	18¼	19½	18¼	19	18
Vermont Con	....	....	....	....	....	....	....	....
Ward	2.05	1.65	2	1¾	1.95	1.80	2	1.85
Wells-Fargo	20c	10c	15c	10c	10c	....	....	....
Woodville	60c	40c	50c	....	45c	40c	40c	35c
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	18⅛	16¾	17⅞	16⅜	16⅜	15¼	17	15⅜

Sales at S. F. Stock Exchange.

Friday A. M., Aug. 29.
20 Alpha....24½
235 Alta....6⅝
110 Andes....95@90c
300 Baltimore Con....50c
100 Best & Belcher....18¾
110 Benton....3.90@3.85
230 Belcher....4.55@4.60
1210 Bullion....7¾@7¼
100 Confidence....10¼
2245 Con Imperial....1½
405 Crown Point....3.80@3¾
205 Con Virginia....4.80@4.85
450 California....4.85@4.95
320 Chollar....6¾@6⅞
280 C Dorado....1.70
150 C P Ravine....25c
90 Caledonia....1.65@1.90
60 Exchequer....6½@6⅜
350 Flowery....60@55c
90 Gould & Curry....11¾
50 Geo Douglas....40c
300 Hale & Nor....14½@14⅝
360 Julia....4¼@4.20
250 Justice....3@2.95
175 Kentuck....4¼@4
150 Lady Bryan....55c
200 Leviathan....25@30c
210 Lady Wash....1.15@1.20
290 Mexican....34@34½
225 Mackey....1
110 North Con Vir....8
270 N Bonanza....1.40@1.45
1800 New York....70@80c
360 Occidental....75@80c
135 Ophir....36½@36
10 Overman....8¾
790 Potosi....5@4.90
300 Plutus....1.90
1550 S Utah....5c
290 Savage....14½@14¾
100 Silver Hill....1.55
370 Scorpion....2½
10 Seg Belcher....24
300 Succor....10c
125 Sierra Nevada....42@41½
20 Utah....18
75 Union Con....56@56½
175 Ward....1.85
80 Woodville....40c
150 Yellow Jacket....15¾@15½

AFTERNOON SESSION.
920 Argenta....80@75c
50 Albion....15c
300 Adenda....50c
200 Boston....1.35
210 Bulwer....6⅝
350 Black Hawk....1
20 Belvidere....70@75c
165 Bodie....10¾@10⅝
680 Booker....1¼@1.20
355 Belmont....80c
795 Belle Isle....4.35@4.30
800 Bechtel....1¼@1.30
7200 Big Prize....30@35c
350 Champion....40@45c
200 Concordia....10c
1880 Caledonia (B H)....2¼@2
450 Crœsus....25@20c
25 C Pacific....7
150 Day....10c
140 Dudley....1
10 Eureka Con....16¾
620 Endowment....50@45c
320 Grand Prize....3.15@3.55
100 Goodshaw....45c
600 Gila....55@50c
800 Hussey....5c
500 Independence....2.10
255 Jupiter....2
50 K K Con....1
250 Leopard....30c
425 Martin White....2¼@2.30
250 Mammoth....9½
245 Mono....7½@7⅝
20 Modoc....1¼
200 Mt Diablo....4½
30 Manhattan....2¾
600 N Belle Is....45c
100 Noonday....3¾
700 Navajo....25@30c
130 N Noonday....2.80@2¾
550 Orient....20@25c
150 Phenix....1¼
155 Paradise....2.90@2.80
175 Queen Bee....50c
150 Real Del Monte....2½
300 Richer....15c
1680 Ray'd & Ely....65c
200 Revenue....1
65 Real del Monte....2
450 Star....40@45c
100 S Standard....5c
200 S Bulwer....60@65c
350 Summit....1.60
250 Syndicate....6⅜
370 Tioga Con....3¼@3.45
310 Tiptop....75@80c
200 University....25c
100 Vortex....60c

Saturday A.M., Aug. 30.
310 Alpha....25@25½
695 Alta....6⅜@6¾
260 Andes....90c@1
1000 Argenta....75@80c
100 Albion....15c
100 Adenda....50c
135 Best & Belcher....18½
445 Belcher....4.65@4.55
1130 Bullion....8@7¾
395 Baltimore Con....50c
750 Benton....3.80@3.55
1350 Belle Isle....4.40@4.45
25 Bodie....10¾
450 Bechtel....1.30@1¼
160 Bulwer....8⅞@9
40 Belvidere....75c
175 Black Hawk....1.05
300 Boston....1.35
20 Booker....1.20
2200 Big Prize....35c
135 California....4.95
120 Chollar....7@6¾
665 Crown Point....3¾@3.80
340 Con Virginia....4.80@4.85
990 Con Imperial....1.55@1½
190 Caledonia....1.90@1.95
300 C P Ravine....25c
30 Challenge....2
350 Con Dorado....1.70@1¾
500 Concordia....10c
35 C Pacific....7@6⅞
300 Defiance....40c
110 Dudley....1
365 Exchequer....6¾@6⅞
120 Eureka Con....16¾@16
1350 Flowery....80@70c
190 Gould & Curry....11¾@12
100 Geo Douglas....40c
1400 Gila....50c
800 Grand Prize....3¼@2¾
400 Goodshaw....40@50c
85 H & Norcross....14⅞
200 Independence....2.10@2.15
95 Justice....2.90@2.85
185 Julia....4.40@4.35
200 Jupiter....2
100 Kossuth....20c
50 K K Con....1
330 Lady Bryan....55@60c
100 Lady Wash....1.20
100 Leviathan....25c
1600 Leopard....35c
1600 Leeds....70c
425 Mexican....34¾@34
100 Mountain View....2¾
80 Manhattan....2¾@2.80
980 Mackey....1@1.05
50 Modoc....1
80 Mammoth....9¼@9
740 Mono....7@7½
515 M White....2¼@2.20
50 Mt Diablo....4¼
100 Navajo....25c
1355 N Bonanza....1⅞@1.85
1355 New York....90@85c
120 Northern Belle....3½@3¾
400 N Belle Is....45c
55 Noonday....3.80
100 N Noonday....2¾
245 Ophir....36½@36¾
20 Overman....8¼
50 Occidental....75c
160 Orient....25@20c
490 Potosi....5⅜@5½
100 Phil Sheridan....40c
125 Paradise....2¾@2.60
200 Raymond & E....70c
200 Richer....35c
30 Real del Monte....2
200 Revenue....1
455 Savage....15@14¾
175 Sierra Nevada....41¾@41¼
200 Succor....10c
50 Silver Hill....1½
160 Scorpion....2.60@2.70
450 S Utah....5c
500 Silver Prize....10c
200 Summit....1.70
150 Syndicate....6¼@6½
545 South Standard....5c
285 Tioga Con....3½
50 Trojan....25c
45 Tuscarora....10c
100 Tiptop....80c
30 Utah....18
275 Union Con....55½@56
400 University....30c
50 Vortex....60c
60 Woodville....35c
415 Ward....1.85@1.90
50 Wales....7½
65 Yellow Jacket....15⅝@15½

Monday A. M., Sept. 1.
90 Alta....6½
160 Alpha....24¼@24
1030 Benton....3½@3.55
730 Bullion....7¼@7½
130 Belcher....4.55
50 Confidence....10¾
1150 Con Imperial....1½
155 Caledonia....1.90
150 C P Ravine....25c
10 Crown Point....3.80
250 Chollar....6¾@6½
260 California....4.95
305 Con Virginia....4.80@4.85
350 C Dorado....1.65
170 Exchequer....6¼
450 Flowery....60c
340 Gould & Curry....11⅝@11⅞
415 Hale & Nor....14¼@14
520 Julia....4.20
380 Justice....2.80@2.90
50 Kossuth....20c
95 Kentuck....4@4½
100 Leviathan....30c
110 Lady Wash....1.10@1.05
500 Mackey....1@1.10
210 Mexican....33½
2450 New York....55@70c
580 N Bonanza....1⅞@1.70
120 Occidental....75c
150 Ophir....35¾@36
220 Plutus....2½
290 Potosi....4.85
400 S Utah....5c
735 Savage....14⅜@14½
145 Scorpion....2½
200 Silver Hill....1½
100 Sierra Nevada....40¾@40½
55 Utah....18
205 Union Con....56@55½
100 Woodville....35c
295 Yellow Jacket....15⅜

AFTERNOON SESSION.
1320 Argenta....80@75c
600 Adenda....50c
245 Black Hawk....1.05@1
270 Booker....1.10@1.15
110 Bulwer....9
200 Bodio....10½@10
350 Bechtel....1.30
1000 Belle Isle....4.45@4⅜
170 Belmont....65c
4150 Big Prize....35c
375 Boston....1.35@1.30
250 Champion....40@45c
35 C Pacific....7
400 Concordia....10c
200 Defiance....36c
100 Dudley....90c
35 Eureka Con....16¼@16
60 Goodshaw....45c
670 Grand Prize....3@2.90
1180 Gila....50c
550 Hussey....5c
345 Hillside....1½@1.55
50 Highbridge....5c
150 Independence....2.10
140 Jupiter....2
200 Leopard....40@35c
730 Mono....6¼@6
100 May Belle....25c
220 Mammoth....9
270 McClinton....75c@1
250 Manhattan....3@2.90
850 M White....2@2.10
100 Mt Diablo....4
50 Noonday....3¾
110 Northern Belle....3¾
100 N Noonday....3
100 N Belle Is....50c
10 Navajo....25c
150 Oriental....40c
750 Orient....20@15c
1030 Paradise....2.60
160 Raymond & Ely....75@70c
300 Richer....40c
550 S Standard....5c
50 Syndicate....6
50 Silver Prize....15c
200 Summit....1.60
50 S Bulwer....60c
300 Tuscarora....5c
110 Tiptop....90@85c
350 Tioga Con....3½
200 University....30c

Tuesday A. M., Sept. 2.
60 Alpha....23¾
285 Alta....5⅞@6⅛
125 Andes....95c@1
420 Benton....3.60
980 Bullion....7¾@7½
60 Best & Belcher....18
270 Belcher....4½@4.55
95 Caledonia....1.90@1.85
100 C P Ravine....25c
10 Confidence....11
800 Con Imperial....1½@1.45
110 Challenge....2.40@2¼
150 Con Virginia....4.80@4.85
180 Chollar....6¾
160 Crown Point....3.70@3¾
340 California....4.85
280 Con Dorado....1.60
335 Exchequer....6½@6⅜
775 Flowery....50@55c
550 Gould & Curry....11⅜@11½
100 Geo Douglas....30c
260 H & Norcross....14⅞@14½
460 Justice....2¾@2.60
535 Julia....4.15@4.20
130 Kentuck....4@4.05
150 L Bryan....55c
300 Lady Wash....1.05@1.10
240 Mexican....33¾
200 Mackey....1
110 Mt View....2¾
1345 N Bonanza....1⅜@1.45
10 North Con Vir....7¾
780 New York....70@65c
395 Occidental....90c@1
20 Overman....8¾
115 Ophir....35¾@36
180 Potosi....5
345 Silver Hill....1½@1.55
520 Sierra Nevada....42@42½
735 Savage....14⅜@14½
95 Scorpion....2½
200 S Utah....5c
10 Seg Belcher....23½
100 Trojan....30c
55 Utah....18
535 Union Con....57½@59
160 Ward....1.85
135 Yellow Jacket....15⅜

AFTERNOON SESSION.
530 Argenta....80c
100 Aurora T....20c
45 Bulwer....9
300 Bechtel....1.30
3300 Big Prize....35c
410 Booker....1@1.05
150 Boston....1.30
100 Black Hawk....1.05
515 Belle Isle....4.30@4⅜
130 Belmont....85c
150 Belvidere....75c
200 Champion....45c
100 Concordia....10@5c
400 Caledonia (B H)....2½
100 Crœsus....15c
20 C Pacific....7
100 Dudley....90c
150 Goodshaw....45c
105 Grand Prize....3
200 Giant & O A....5½
200 Gila....55c
800 Hussey....5c
150 Hillside....1.60
45 Leeds....65c
175 Leopard....35c
585 Martin White....2
10 Mammoth....9
250 Mono....5¾@6
550 McClinton....70c
50 Modoc....1
20 Manhattan....3
165 Navajo....25c
10 Northern Belle....3¾
10 Noonday....3½
985 N Belle Is....45@40c
50 Oriental....30c
920 Paradise....2.65@2.55
50 Real del Monte....2
100 Raymond & Ely....65@70c
200 Richer....40c
130 Syndicate....6@5⅞
100 Summit....1½
310 S Bulwer....60@70c
100 S Bodie....30c
100 Silver Prize....10c
240 Tioga....3½@3.55
300 University....25c
100 Vortex....50c

SALES OF LAST WEEK AND THIS COMPARED

Thursd'y A. M., Aug. 28.
275 Andes....1@90c
310 Alta....6¾
45 Alpha....25½
185 B & Belcher....19@19½
260 Belcher....4¾@4.70
970 Bullion....7¼@7⅝
500 Baltimore Con....50c
230 Benton....3.95@3.90
300 Caledonia....2@1.95
330 California....4.80
460 Con Virginia....4.80@4.85
550 Chollar....7@7¼
1875 Con Imperial....1.55@1½
450 Crown Point....4@4.05
100 Confidence....11¼@11
683 C P Ravine....25@20c
300 Con Dorado....1.70
555 Exchequer....6½
650 Flowery....55c
220 Gould & Curry....12¼@12¼
100 Geo Douglas....40c
510 Hale & Nor....15@15¼
305 Justice....3
345 Julia....4.35@4.30
85 Kentuck....4¼
570 Lady Bryan....60@55c
250 Lady Wash....1.10@1.20
455 Mexican....34½@34¼
400 Mackey....1@1.05
100 Mt View....2.85@2¾
950 New York....65@60c
280 N Bonanza....1.40
535 Ophir....37@36¾
15 Overman....8½@9
10 Occidental....65c
990 Potosi....5¼
955 Savage....15¼@14¾
185 Scorpion....2½@2¾
150 Sierra Nevada....42
100 Silver Hill....1.60
15 Seg Belcher....14
200 Succor....10c
550 S Utah....10@5c
165 Utah....19@18¼
395 Union....57½@57
50 Woodville....40c
240 Ward....1.90@1.65
275 Yellow Jacket....16⅜

AFTERNOON SESSION.
200 Albion....15c
1290 Addenda....50c
1130 Argenta....80@75c
500 B Chief....55c
100 Black Hawk....1
430 Booker....1¼@1.20
100 Boston....1.35
30 Bulwer....8¾
4600 Big Prize....30c
100 Bodie....10⅝@11
635 Bechtel....1¼
1170 Belle Isle....4¼@4.30
45 Belmont....75c
250 Belvidere....80c
180 Champion....45c
380 Con Pacific....7
50 Dudley....1.05
50 D Standard....40c
600 Endowment....50c
255 Eureka Con....16¾
10 Giant & O A....5¼
45 Grand Prize....3¼
250 Gila....55c
1080 Hussey....5c
105 Hillside....1½@1.40
500 Independence....2.15
60 Jupiter....2.10
170 K K Con....1
300 Leopard....30c
100 Leeds....70c
645 M White....2.35@2.30
155 McClinton....85c@1
100 Mammoth....8¾
360 Mono....7½@7¼
200 Manhattan....2.85@2.95
100 Northern Belle....3¼@3¾
395 Noonday....3¼
240 Navajo....25c
920 N Belle Is....45@50c
500 Oriental....40c
70 Paradise....2.95
200 Queen Bee....50c
300 Raymond & E....70@65c
100 Real del Monte....2
200 Star....40c
750 S Bulwer....60@55c
30 Summit....1.70
430 Tioga Con....3.60@3.65
400 Tuscarora....5c
250 Tiptop....85@90c
50 University....25c
50 Vortex....65c
75 Wales....7½

Thursday A. M., Sept. 4.
30 Alpha....24
275 Alta....6⅜@6½
200 Andes....90c
230 Best & Belcher....18¼@18½
540 Belcher....4½@4.55
1300 Bullion....8¼@8
420 Benton....3.85@3¾
120 Con Virginia....4.80@4½
150 Chollar....7
60 California....4.85@4.80
100 Confidence....10¾
50 Crown Point....5.80
1310 Con Imperial....1.70@1.65
25 Caledonia....1.90
250 C P Ravine....25c
300 C Dorado....1.70
110 Exchequer....6¾@6⅞
850 Flowery....40@45c
170 Gould & Curry....11⅝@11½
170 Hale & Nor....14½@14⅝
535 Justice....2.90@2.80
245 Julia....4¼@4.30
180 Kentuck....4
45 L Bryan....55c
500 Leviathan....25@30c
550 Mexican....35@34½
250 Mackey....1
895 New York....65@70c
150 N Bonanza....1.45
85 Ophir....36¾
20 Overman....8¾@9
85 Occidental....1
95 Potosi....5½@5⅜
100 Plutus....1.90
410 Savage....14¾@15
85 Sierra Nevada....43@43¾
200 Succor....15c
270 Silver Hill....1.60@1.66
35 Scorpion....2.55@2.60
200 S Utah....5c
100 Trojan....30c
15 Utah....19
420 Union Con....62½@61½
700 Ward....2
145 Yellow Jacket....17

AFTERNOON SESSION.
2330 Argenta....80@75c
10 Aurora T....25c
10 Bulwer....9
6700 Big Prize....35@40c
170 Bodie....10¼
60 Bechtel....1.30
680 Boston....1.30@1.35
155 Booker....1.05@1.10
70 Black Hawk....1
200 Belvidere....80c
1250 Belle Isle....4.20@4¼
510 Champion....40c
350 Concordia....10c
100 C Pacific....6⅞
230 Dudley....80@75c
115 Eureka Con....16¼
100 Endowment....35c
375 Gila....55c
100 Giant & O A....5¾
20 Goodshaw....40c
260 Grand Prize....3
440 Hillside....1.60@1¾
75 Jupiter....1¾
300 Leopard....40c
225 McClinton....70@75c
165 Mono....6⅞@7
730 Martin White....2@2.10
415 Manhattan....3
130 Northern Belle....3¾@3.90
70 Noonday....3¾
60 Navajo....30c
100 Oriental....25c
100 Orient....20c
700 Paradise....2.60@2½
30 Real del Monte....2
70 Raymond & Ely....65@70c
50 S Bodie....25c
440 S Bulwer....65@75c
200 Syndicate....5⅞
700 S Standard....5c
250 Summit....1½
50 Star....40c
50 Tuscarora....20c
200 Tioga Con....3.60@3½
300 University....30c
50 Wales....8¼

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Con M Co	Nevada	10	1 00	Aug 7	Sept 11	Oct 1	Wm Willis	309 Montgomery st
Argonaut M & M Co	California	1	05	Aug 11	Sept 15	Oct 6	J L Fields	240 Montgomery st
Belcher S M Co	Nevada	19	1 00	July 21	Aug 26	Sept 16	Jno Crockett	203 Bush st
Belvidere M Co	California	4	25	July 9	Aug 11	Sept 6	C V Hubbard	203 Bush st
Bullion M Co	Nevada	11	50	Aug 12	Sept 16	Oct 7	J M Brazell	418 California st
Caledonia S M Co	Nevada	28	50	Aug 21	Sept 26	Oct 17	R Wegener	414 California st
Champion M Co	Nevada		05	July 26	Aug 31	Sep 30	G C Hurlbut	525 Commercial st
Chollar M Co	Nevada	1	60	Aug 29	Oct 3	Oct 24	W E Dean	203 Bush st
Crown Point G & S M Co	Nevada	38	1 00	Aug 27	Oct 1	Oct 22	James Newlands	203 Bush st
Dudley M Co	California	5	50	Aug 14	Sept 17	Oct 13	E C Masten	22 Nevada Block
Eagle S M Co	Nevada	14	10	Aug 4	Sept 10	Sept 30	J E Byrne	533 Kearney st
Flowery M Co	Nevada	2	25	Aug 6	Sept 10	Sept 30	W W Stetson	309 Montgomery st
Gold Deposit G & S M Co	California	1	25	July 25	Aug 28	Sept 16	J M Buffington	209 California st
Goodshaw M Co	California	4	25	July 9	Aug 23	Sept 30	V Fornbach	327 Pine st
Hussey Con G & S M Co	Nevada	9	15	Aug 25	Sept 30	Oct 21	Jno E Dixon	20 S. F. Stock Ex.
Justice M Co	Nevada	—	1 00	——	Sept 11	Sept 30	R E Kelley	419 California st
K K Con M Co	Nevada	—	1 00	Aug 1	Sept 3	Oct 1	B B Minor	309 Montgomery st
Leopard M Co	Nevada	12	50	Aug 23	Sept 26	Oct 17	Jno E Dixon	20 S F Stock Ex.
Leviathan M Co	Nevada	9	25	Aug 6	Sept 9	Sept 30	F E Luty	330 Pine st
Manhattan S M Co	Nevada	3	1 00	July 16	Aug 21	Sept 12	Jno Crockett	203 Bush st
McCrackin Con M Co	Arizona	3	25	July 29	Aug 29	Sept 17	H Aug Whiting	211 Sansome st
North Bonanza M Co	Nevada	3	25	Aug 13	Sept 17	Oct 7	W W Stetson	309 Montgomery st
Original Keystone S M Co	Nevada	2	25	July 28	Sept 1	Sept 28	F E Luty	330 Pine st
South Bodie G M Co	California	1	25	July 18	July 25	Sept 17	H Deas	309 Montgomery st
South Bulwer	California	4	15	July 16	Aug 20	Sept 12	Wm Stuart	320 Sansome st
Succor M & M Co	Nevada	24	25	Aug 30	Oct 3	Oct 23	Wm H Watson	302 Montgomery st
Tellurium G & S M Co	California	19	10	Aug 1	Sept 1	Sept 24	J M Litchfield	415 Montgomery st
Trojan M Co	Nevada	11	25	July 14	Aug 18	Sept 8	David Wilder	328 Montgomery st
Tuscarora M & M Co	Nevada	4	10	Aug 2	Sept 6	Sept 30	M E Sperling	309 California st
University G M Co	California	3	20	Aug 21	Sept 24	Oct 15	W L Oliver	328 Montgomery st
Union Con S M Co	Nevada	14	2 00	July 31	Sept 4	Sept 23	J M Buffington	309 California st
William Penn	Nevada	5	05	July 12	Aug 20	Sept 15	O J Humphrey	328 Montgomery st
Yellow Jacket S M Co	Nevada	33	1 00	Aug 4	Sept 8	Oct 8	Mercer Otey	Gold Hill, Nevada

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Belle Isle M Co	Nevada	Jno E Dixon			20 S F Stock Ex		Annual	Sept 25
Crœsus G & S M Co	California	2	10	Aug 22	Sept 23	Oct 11	E Huestis	328 Montgomery st
Dudley M Co	California	5	50	Aug 14	Sept 17	Oct 13	E. C. Masten	309 Montgomery st
Harrington M Co	California	1	20	Aug 11	Sept 18	Oct 8	W W Bausman	426 California st
Keystone S M Co	California	2	25	July 28	Sep 16	Oct 6	F E Luty	330 Pine st
North Scorpion M Co	Nevada	1	10	Aug 11	Sept 20	Oct 10	T B Ludlum	318 Pine st
Original Keystone S M Co	Nevada	2	25	July 28	Sept 1	Sept 28	F E Luty	330 Pine
Occidental M Co	Nevada	5	50	Aug 11	Sept 15	Oct 6	A K Purhrow	309 Montgomery st
Paradise Valley M Co	California	—	25	——	Aug 18	Sept 8	——	13 Safe Deposit Building
Santa Mina G M Co	California	1	15	Aug 29	Oct 2	Oct 22	J H Sayre	330 Pine st
San Pedro G & S M Co	California	2	05	July 29	Aug 29	Sept 15	T A White	113 Leidesdorff st
Richer M Co	California	3	25	July 13	Sept 8	Sept 23	W H Lent	309 Montgomery st
Wide Awake M & P Co	Arizona	7	02	June 23	Aug 1	Sept 1	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Bodie Hydraulic M & W Co	California	E C Masten	22 Nevada Block	Annual	Sept
Dudley M Co	California	E C Masten	22 Nevada Block	Annual	Sept
Grand Prize M Co	——	John E Dixon	S. F. Stock Ex.	Annual	Sept 16
Jupiter M Co	California	E C Masten	22 Nevada Block	Annual	Sept 15
Mammoth Grove M Co	——	Directors	328 Montgomery st	Stockholders	Sept 9
Northern Belle M & M Co	——	Wm Willis	309 Montgomery st	Annual	Sept 8
Riqueza M Co	California	R Ellon	310 Pine st	Annual	Sept 10
South Bulwer G M Co	California	J Miller	320 Sansome st	Annual	Sept 18
South Standard M Co	California	C A Sankey	331 Montgomery st	Annual	Sept 11
Tuscarora M & M Co	——	M E Sperling	309 California st	Annual	Sept 10

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Belle Isle M Co	Nevada	John E Dixon	Stock Exchange	50	Aug 5
Bodie Con M Co	California	W H Lent	Nevada Block	1 00	Aug 1
California M Co	Nevada	C P Gordon	23 Nevada Block	50	Aug 17
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	50	Aug 18
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	1 00	July 21
Independence M Co	Nevada	John E Dixon	Stock Exchange	25	Aug 21
Indian Queen M & M Co	——	A K Durbrow	69 Nevada Block	20	Aug 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	July 26
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	30	July 28
Montezuma M & M Co	——	J T McGeoghegan	318 Pine st	25	Aug 12
Standard Con M Co	California	Wm Willis	309 Montgomery st	50	Aug 12

California Board—Latest Sales.

Tuesday A. M., Sept. 3.
10 Alpha....24
70 Alta....6
600 Atlas....2c
700 Atlantic....30@25c
30 Belcher....4¼
80 Bullion....7¼@7½
60 California....4.90@4.85
30 Con Virginia....4.80
200 Con Imperial....
120 Caledonia....1.90
30 Exchequer....6¾
30 Gould & Curry....11⅜@11¼
150 Goodshaw....45c
20 Hale & Nor....14¼
75 Julia....4.05
230 Lady Wash....1.10
20 Mexican....33⅜@33¼
200 Mint....8c
40 Mono....6⅞
100 New York....67½c
650 North Carson....1c
20 Ophir....35@35⅜
120 Phil Sheridan....25c
30 Savage....14
20 Sierra Nevada....40¼@40½
100 Trojan....26c
20 Union Con....55½@55⅝
300 Wm Penn....9c
140 Ward....1.65
10 Yellow Jacket....15½

AFTERNOON SESSION.
10 Alpha....23¾
50 Alta....6@6¼
300 Ætna (A)....7c
100 Atlanta....1c
1100 Atlas....2c
10 Best & Belcher....18
30 Bullion....7½@7¾
20 Belcher....4¼
30 California....4.85
20 Con Virginia....4.80
100 Con Imperial....1.45
40 Crown Point....3⅞@3.70
120 Caledonia....1.85
500 Coso Con....3c
100 Enterprise....1¼
50 Exchequer....6½@6⅞
40 Gould & Curry....11¼
100 Golden Chariot....7c
130 Lady Wash....1.30
20 Mexican....33¼
100 Mint....9c
100 New York....67½c
20 Ophir....36
40 Potosi....6.60
20 Savage....14¼
10 Sierra Nevada....42¼
300 S Utah....3c
100 S Bodie....32½c
20 Union Con....59
30 Yellow Jacket....15⅜

Pacific Board—Latest Sales.

Tuesday A. M., Sept. 3.
10 Alpha....24
170 Alta....6@6¼
150 Andes....90@95c
170 Belcher....4.55@4.60
70 Benton....3.65
190 Bullion....7½@7¾
60 Best & Belcher....18@18¼
850 Con Imperial....1½@1.45
150 Con Virginia....4.85
150 Crown Point....3⅝@3.65
20 California....4.90
400 Chollar....6¾@6⅝
80 Exchequer....6⅝
260 Gould & Curry....11¼@11⅜
80 Hale & Nor....14½
95 Julia....4.20@4.15
200 Justice....2¾
270 Mexican....33@34¼
450 Mono....5¾
50 New York....65c
70 Ophir....36@36¼
50 Ophir Con....3
70 Savage....14@14¼
120 Silver Hill....1½
40 S Nevada....41¼
30 Utah....18
50 Union....55½@58½
20 Yellow Jacket....15⅜

AFTERNOON SESSION.
50 Bullion....7⅝
60 Belcher....4.55@4.60
25 Best & Belcher....18
150 Benton....3.65@3.60
100 Caledonia....1.85
35 Con Imperial....1½@1.45
10 California....4.90
15 Con Virginia....4.85
20 Crown Point....3¾
30 Exchequer....6⅞
10 Gould & Curry....11¼
170 Hale & Nor....14⅝
10 Justice....4.80
200 Julia....4.40
60 Mexican....33⅜@33¼
120 Mono....5¾@6
50 N Bonanza....1.40
300 N Standard....2.15
20 Ophir....35⅞
10 Savage....14¼
50 Silver Hill....1.55
50 Scorpion....2½
30 Uncle Sam....4¼
5 Union Con....57½

The Mining Share Market.

The movements of the stock market during the past week have not indicated anything significant. The reports from the Comstock, although favorable in a great measure, have not influenced the price. Bodie is somewhat lower, notwithstanding flattering prospects. Even the visions of enormous wealth, so graphically portrayed to the public by some mine-owners, have not created a ripple of excitement. Apathetic might express the feeling. Perhaps the lull presages a coming storm.

THE ceremonies of unveiling the Custer monument took place at West Point, Saturday.

THE amount of National Bank circulation outstanding Saturday was $329,344,147.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

ITEMS.—*Dispatch*, Aug. 30: The cam-shaft of the Gover mine, which was broken about a week ago, was fixed up and put in working order last night, and the mill is now crushing away as usual. At Plymouth the mining outlook was never better than at present. There are three mines in prospective operation and we hope to give you something more authentic soon.

INYO.

MODOCK.—*Independent*, Aug. 30: South drift, 300-ft point, run 16 ft; north drift, 300-ft point, run 12 ft; north drift, 800-ft point, run 17 ft; north crosscut, 1000-ft point, run 18 ft; south drift, 1100-ft point, run 12 ft. Total length of south drift, 300-ft point, 172 ft. North drift, 300-ft point, 90 ft; north drift, 800-ft point, 144 ft. North crosscut, 1000-ft point, 23 ft; south drift, 1100-ft point, 144 ft. The face of the north drift, 300-ft point, continues in ore, as at last report. At a distance of 18 ft in this drift ore came in at the top and at half the present length of drift the top, bottom and face was in ore. At a short distance from this point they cut through the ore in the top of drift and have since had it about two-thirds up in the face, also in the bottom, with little variation. The apparent course of this ore vein has been downward and into the hill, following the direction of the drift. The ore at the face of drift appears much stronger and is in better ground than at any previous time. Assays from this drift, made to-day, run as follows: No. 1, 70% lead, 130.-08 ounces silver; No. 2, 41% lead, 194.40 ounces silver; No. 3, 37% lead, 155.53 ounces silver.

LOS ANGELES.

ITEMS.—*Gazette*, Aug. 30: Some excitement exists in Shrewsbury canyon over the reported discovery of a rich gold ledge. Three quills of gold dust were mined at San Jacinto. The dust was of fine quality, being rated at $16 an ounce. A gentleman who returned Monday from the vicinity of the San Gabriel canyon, reports having located a fine placer mine in a new location. He brought in about $15 worth of coarse scale gold with him as a sample.

MONO.

STANDARD.—*News*, Aug. 31: The north drift, 385 level, is in 355 ft; the ledge is three and one-half ft wide, and looking very well. The stopes on this ledge are looking particularly well, especially in the south end and where the ledge is about 10 ft wide of very rich ore. The winze on the 550 level has reached a depth of 115 ft; the ledge is four ft wide, of very good ore. The upraise is up 120 ft, showing a ledge 10 ft wide, of good milling ore. The west crosscut, 300 level, is in 68 ft. In the West Standard stopes the ledge is about 10 ft wide and of fine ore. In the south drift, 550 level, the ledge is from 10 to 15 ft wide, of good ore. In the Gildea stopes the ledge is about three and one-half ft wide, of fine milling ore.

NOGA.—No. 3 vein, 520 level, is down 20 ft; becoming richer and the gold coarser. The southeast and northeast drifts on the same level develop about the same results.

VORTEX.—The ledge in the bottom is two ft wide, of fair milling ore; average assays during the week running from $45 to $65 per ton. Connection will soon be made with the west crosscut from the Osceola mine, and will cut the ledge at a depth of 290 ft from the surface.

SOUTH BULWER.—Drifting on the ledge, 350 level, which is three ft wide, of solid, lively quartz and good milling ore. Drifts have started north and south from the bottom of winze No. 2. The ledge in both drifts is looking well; two and one-half ft wide of fine milling ore. West crosscut, 420 level, advanced nine ft during the week; total length, 45 ft—the face being in a favorable formation of quartz and clay, with every indication of soon striking the ledge.

BLACKHAWK.—The main shaft has reached a depth of 338 ft in good working ground. The winze on the Warren vein, from the 320 level, is down 150 ft, and in very favorable quartz and clay. The east drift on the 320 level is in 120 ft. The winze on the Liberty vein, from the 220 level, is down 37 ft, and the ledge improves greatly as depth is attained.

SUMMIT.—The north drift, 200 level, is in 345 ft. The ledge is about two ft wide. East crosscut from this drift is in 229 ft. The ground here continues very hard. The north drift, 300 level, has been run since last report 38 ft; total length, 328 ft. The ledge is two and one-half ft wide and looks well. The south drift, same level, is in 311 ft; the ledge is three ft wide.

BULWER.—The south drift, 380 ft level, has been extended 10 ft. The ledge is two and one-half ft of good ore. The west crosscut from this drift is in 42 ft. The winze on the Ralston ledge has reached a depth of 47 ft; the ledge is two ft wide and looks well. The formation in the tunnel is still very hard.

MCCLINTON.—This company are sinking a new shaft some distance north of the old works, which has reached a depth of 92 ft. The ledge at the bottom is about two ft wide of good milling ore. The west crosscut on the 500 level of the old works is in about 60 ft. The north drift, on the same level, is in 45 ft, and has developed a 20-inch ledge. The drift on the Bulwer ledge is now in 62 ft, showing a ledge two ft wide.

CHAMPION.—The winze on the 400 level has been sunk 30 ft, with a good body of ore the entire distance. The south crosscut on the 400 level has been extended 40 ft, with the face in quartz of a good paying quality.

ADDENDA.—Work for the past week has been chiefly confined to the 200 and 360 drifts. The former drift is now in from station 17 ft, and the latter 47 ft. This drift shows a well-defined ledge of low-grade ore. Progress for the week, 32 ft.

RED CLOUD.—The north drift on the 250 level is showing some very fine quartz. The ledge improves in strength and quality as it is opened up.

SOUTH NOONDAY.—A winze on the ledge has been started from the level in the north drift; the vein is three ft wide of a fair quality of ore.

BELVIDERE.—The shaft is down 235 ft in vein formation carrying considerable quartz.

STANDARD CON.—The shaft is down about 125 ft. The formation of the rock is changing to a decomposed quartz, with a mixture of clay. A whim will be erected this morning.

UNIVERSITY.—Everything about this mine has the appearance of speedy development. The shaft is now down about 95 ft, with a very favorable outlook. The timbers, boilers, etc., are now on the ground for the new hoisting works, and they will be set in place as soon as the balance of the machinery arrives, which is now on the road.

BOSTON CON.—In sinking the shaft a new ledge about 16 inches in width was discovered, consisting of a reddish colored quartz, which assays about $40 per ton. The richest assay comes from the bottom.

TRUE BLUE.—This mine is working with a full force; all the work is being done on main tunnel, which is now in 135 ft. Some fine seams of quartz are being crossed. Face of tunnel is now in basalt rock, quite hard, but breaks well. Indications denote vein close at hand. The croppings show fine ore in this mine. Immense quantities of ore in sight.

NAPA.

ITEM.—*Register*, Aug. 16: J. H. Francis is taking good ore out of the tunnel he is running into a ledge on his ranch, considering the depth he is cutting the ledge from the top—30 ft. The ledge is well defined, and shows better ore as greater depth is reached, that already taken from it being rich enough to pay well for milling.

NEVADA.

CHAPMAN RANCH CLAIM.—*Transcript*, Aug. 27: Messrs. Skidings & Spence commenced work on a ledge at Chapman's ranch near this city last Christmas. They first took out a crushing of five tons, then another of nine tons, and about two weeks ago one of 13 tons. The ore has averaged $40 per ton. The shaft in which they were working shows a two-ft ledge, but made too much water to permit steady operations without machinery, and during odd intervals they have been engaged in running a tunnel to tap the lead. This tunnel is now in about 100 ft, and has recently been showing some encouraging signs in the way of cap-rock. There is no doubt but they will reach the ledge through it. It is likely that this claim may develop into an extensive one.

THE DEADWOOD MINE.—The mill at the Deadwood mine is now engaged in crushing the second 100-ton lot of ore that has been produced this month. It is high-class rock. The average product of the mine pays from $35 to $45 per ton.

A FOREST SPRINGS MINE.—William Hearne, John Noia and B. Courant struck the Lone Tree and Sunny Side ledge near the Shamrock mine, at Forest Springs, on the 24th inst., and the result is sufficiently encouraging to repay them for many weeks of untiring labor in the face of difficulties. Commencing work over a month ago, a shaft 26 ft deep was sunk, when the water came in so fast they had to abandon it. A tunnel was then started, and it was through the latter they reached the ledge, which is found to be about three ft thick, and reasonably rich in free gold. The claim has formerly been worked to some extent, but unprofitably.

PLANET MINE.—The tunnel of the Planet mine is in 1,900 ft. From the end of it an incline has been run 100 ft, following the bedrock which is pitching into the hill. The gravel looks well, and contains considerable fine gold. The company are running for the center of the channel, and feel much encouraged with their prospect. The tunnel is one of the finest pieces of work of that character ever performed in Nevada county. From the inner end the mouth of it is plainly to be seen, so straight is the line.

SIERRA.

ITEMS.—*Transcript*, Aug. 30: At the Oriental mine they have commenced work underground. In upraise from fourth level are working two shifts. Ore is very good, with a large percentage of galena sulphurets. The Santa Anita claim is looking splendidly. The ledge has been developed to a depth of 250 ft by shaft and tunnel, and is eight ft thick at that point.

SIERRA BUTTE MINE.—*Reno Gazette*, Aug. 30: The old Sierra Butte mine is working with a good result, crushing about 100 tons of ore per day. It is owned by an English company. The old blue gravel channel has been struck, and is rich in free gold. There are several ledges of ore prospecting free gold and carrying small quantities of silver and some copper stains.

TUOLUMNE.

ITEM.—*Independent*, Aug. 30: R. C. Davis & Co. have been engaged prospecting a quartz vein near the celebrated Riverside mine of late, with the most flattering results. They have sunk on the vein 50 ft, and at the bottom of the shaft it is five ft thick and well defined. Mr. Davis exhibits some of the ore taken from the shaft that is extremely rich. By simple tests it is ascertained to yield $800 per ton. The company are managing to have a few tons of the ore already extracted milled, and should it yield one-half the amount it shows by the ordinary process of testing, considering the size of the lead and the advantages for working it, it will be in reality a bonanza, and well worth the time and cost of discovery. This mine is called the Continental, is situated on the south tributary of the Stanislaus river, and about three-quarters of a mile above the Riverside mine.

YUBA.

ITEM.—*Appeal*, Aug. 29: After a run of eight months the Nevada company cleaned up this week and brought to Marysville $34,000 or upwards.

NEVADA.

WASHOE DISTRICT.

NORTH BONANZA AND FLOWERY.—Gold Hill *News*, Sept. 3: The flow of water into the bottom of the shaft is lessening very fast. Crosscuts are being run from both north and south drifts, 400 level, 100 ft each way from the shaft, but neither crosscut has yet cut the ledge, although that to the north is showing indications of being very near the vein. Crosscut No. 1 north, 300 level, is in quartz giving better assays. No. 2, where the best ore was found, has cut through some eight ft of porphyry and is again in fine-looking quartz. No. 3 is in 20 ft and is cutting a formation similar to that penetrated by No. 2 before reaching the porphyry. Some of the assays are excellent.

CALIFORNIA.—The north drift from the joint west crosscut, 850 level, is cutting hard rock, its face 35 ft from the crosscut. A corresponding drift is being pushed south, and the two will be used to furnish a base for crosscuts to open up the vast section of unexplored ground lying in this portion of the mines. The north drift, 1950 level, from crosscut No. 1, is in 117 ft, and is encountering some ore. The north drift on the 2150 level leading to the Ophir is still being graded down. The ore vein crossed by the main north drift on this level is being followed south. The new pump-rod is being put in at the C & C shaft. It will extend from bottom to top and carry the double line of pumps up to the Sutro tunnel level.

SIERRA NEVADA.—The water is held just below the station on the 2200 level, where a common pump has been placed to lift the water up to the level. In a day or two a drift will be started east from the bottom of the east shaft, 2200 level, from which to sink a winze and run a drift to connect with the 2400 station of the incline.

OPHIR.—The north drift, 2300 level, is being pushed on at the rate of 6 ft per day, the face in vein matter showing streaks of clay and quartz. From the end of the main drift east a crosscut has been started in search of the Hardy vein. Low-grade ore is being encountered on the 2100 level in the drift north from the west crosscut and running along the Hardy vein; total length of the drift, 30 ft. The joint Mexican crosscut on the 2000 level is cutting vein matter carrying streaks of quartz; total length, 92 ft. The stopes yield their usual 80 tons of good ore.

JUSTICE.—Fine quartz giving moderate assays and occasionally a bunch of good ore are encountered in crosscuts Nos. 1 and 3, 1550 level. In the lateral drifts north and south, along the west ore chamber, some nice quartz and bunches of good ore have been found.

HALE & NORCROSS.—The mine has been freed of water, and the debris is being taken from the sump of the incline. No water has come in from the Savage since Sunday. East drift, 2100 level, is in 46 ft, and in hard rock. A winze will be sunk to the 2200 level as soon as the requisite distance is gained.

EAST BONANZA.—An incline shaft has been started on the east line of the ledge and is now down 33 ft. The old tunnel has been cleaned out and a full force of men are now at work on the claim.

EXCHEQUER.—The total length of the north drift, 2400 level, is 566 ft. It has now reached the north line of the mine and has been given over to the Bullion for continuation.

NIAGARA.—Good ore prospects in both drifts north and south.

OVERMAN.—The formation encountered in the east crosscut, 1600 level, is promising ledge matter. Since last report guides have been put in the north compartment of the mine from the 1600 level to this level and the air pipes have been changed.

BROPHY.—The tunnel has reached the vein and is in quartz yielding low assays. A drift has been started south to develop a vein 20 ft in width recently passed through.

TROJAN.—The west drift from the third station is in quartz and porphyry, the former giving good assays. The drift has been enlarged and retimbered, and track and turn-table have been put in.

GOLDEN STANDARD.—The tunnel, which is to intersect the Homestead shaft, is in ground of purely a vein formation, carrying streaks and bunches of quartz, intermixed with clay.

SAVAGE.—The station on 2200 level is not yet free from water. The heat is intense.

UNION SHAFT.—The shaft is being driven toward the 2200 level of the Sierra Nevada. The rock is hard; total depth, 60 ft below the 2000 level. The drift west on the 1600 level to connect with that coming from the Union side is in 100 ft and in good working ground.

MEXICAN.—The joint Ophir crosscut west, 2000 level, is in vein porphyry carrying streaks of quartz; total length, 92 ft. The joint Union winze from this level encounters considerable water, although the rock is somewhat softer; total depth, 42 ft. The joint Union crosscut west penetrates vein matter carrying streaks of clay and quartz, its face 82 ft from the main north drift.

CON. VIRGINIA.—On the 2150 level the east crosscut is passing through favorable material carrying stringers of quartz; total length, 175 ft.

UNION CON.—The drift east, 1600 level, is being extended toward the Union shaft on an average 4 ft per day; total length, 260 ft. The joint Mexican crosscut, 2000 level, is making three ft per day through vein matter carrying streaks of quartz and clay; total length, 82 ft. The joint Mexican winze from this level is cutting softer rock carrying considerable water; total depth, 42 ft.

LADY BRYAN.—The raise for the incline from the 750 level to the 600 level was started up to-day. The north drift, 750 level, is encountering more quartz, which looks well. The south drift on this level is in hard porphyry. The drift west from the south drift, 600 level, is encountering a promising formation of clay, porphyry and quartz which gives low assays. The east crosscut from the north drift is in porphyry containing streaks of quartz.

ALTA.—The north and south drifts on the 1750 level continue to penetrate quartz and quartzite, and nearly the whole bottom of the incline is being pushed on down through a similar formation.

BULLION.—The double incline winze from the 2150 level is now 104 ft on the slope below that level. The bottom is in clay, porphyry and quartz of a promising nature. The Exchequer drift north, 2400 level, has reached the Bullion line and has been taken up and is being carried on to meet the winze when it reaches that level.

ARGENTA DISTRICT.

ITEMS.—Tybo *Sun*, Aug. 30: Considerable fine ore is being taken out of the Oliver Twist mine. The returns from the ore assayed shows gold $41, and silver $847, total $888. The New Philadelphia company mine Bismarck is opening out well and has yielded a good lot of ore now on the dump.

BELMONT DISTRICT.

BELMONT.—*Courier*, Aug. 30: Drift running south from No. 3 raise has been advanced 16 ft through a vein of quartz 15 inches of which is good milling ore. Raise No. 4 has been advanced 18 ft without any material change. Raise from 200 south level was advanced 12 ft through a streak of high grade chloride ore. The stope south of this raise is looking fine and getting larger every day, this body of ore will extend up to the old incline level, which is on the dip of the vein 160 ft above the 200 shaft level.

GILA.—The south drift winze No. 2 was sunk 5 ft during the past week, and drift from bottom of winze run 8 ft. In the former there is a wide vein of good ore, a part of which is very rich, an assay made of the best to-day giving $1,470.50 per ton. The stopes are all looking well.

CHIMNEY CREEK DISTRICT.

ITEM.—Eureka *Sentinel*, Aug. 28: Reports say that several very rich strikes have been made in this district. The Henry Clay, a new discovery in that district, owned by Messrs. S. E. Palmer, Bish. Luther, and others, is said to be a rich claim. This district is situated between two high mountains, with wood, water and grass in abundance, easy of access, making it one of the most attractive and convenient in the county.

EUREKA DISTRICT.

PHŒNIX.—*Sentinel*, Aug. 30: The Superintendent says, for the past two weeks we have been running a drift to the southeast on the 200 level, after having run some 80 ft under the old croppings on the surface where a large amount of ore was taken out in early times. We yesterday started a crosscut to the northeast at right angles to the footwall, and after proceeding a few ft, cut into a body of ore, the ore being high grade, but so far somewhat mixed with bunches of lime. We have raised some six tons of good ore out of this place in the past 24 hours, assaying about $120 per ton, and at least 40% lead.

PARADISE DISTRICT.

ARTHUR CON.—Paradise *Reporter*, Aug. 30: An important strike was made in this mine yesterday. The first blast in the ledge to-day showed ore of a very encouraging character, with green copper or mineral streaks running through it. There has been a large amount of work done in tunneling to strike this mine, but at last the efforts of the owners are crowned with success.

SILVER STATE DISTRICT.

ITEM.—*Silver State*, Aug. 29: Angus Morrison has a force of men at work on the Olompali mine, in Black canyon, in the Humboldt range, east of the Humboldt House. This ledge was located in 1861. It is about 20 ft wide and it crops out boldly for a long distance on the surface. Mr. Morrison is drifting on the hanging wall of the lead, and at a depth of 60 ft from the surface the ore assays from $10 to $50, principally gold, to the ton. Choice pieces of the ore assay over $100 per ton.

ETHAN ALLEN.—*Silver State*, Sept. 2: T. F. Harlan, assayer at Paradise valley, who recently visited the Ethan Allen mine, on Willow creek, reports it one of the largest ledges ever discovered in the country. It is located on Willow creek, where there is plenty of fuel and water for reduction works, six or seven miles from the Ohio mine. The ledge crops out about 100 ft wide on the surface, and is prospected by a tunnel which has been run 30 ft into the ledge, showing ore all the way. The ore assays from $30 to $900 in silver per ton, the average being considerably over $100.

TYBO DISTRICT.

ITEM.—Tybo *Sun*, Aug. 30: The Tybo Con. is yielding well, $2,200 bullion shipped to-day, and three bars more ready to ship. Work is being prosecuted with vigor on the G. F. mine. The vein is now four ft wide, all of which is good milling ore. A windlass is being erected and a blacksmith shop built at the mine to facilitate work.

WILLOW CREEK DISTRICT.

ITEM.—Paradise *Reporter*, Aug. 30: A gentleman from this district reports everything prosperous in that camp, and says the mines are all looking well. The Ohio is producing some very rich ore, which is being sacked, and will be shipped to Salt Lake for reduction, next week.

ARIZONA.

ITEM.—Prescott *Miner*, Aug. 29: In the Crook ledge the tunnel is now in 80 ft and being driven day and night by three shifts, of two men each. The tunnel is five ft wide by seven ft high, and will strike the ledge in about 250 ft, at a depth of 200 ft from the surface. There is a shaft down 100 ft on the mine with a pay streak in the bottom four ft wide that goes in the neighborhood of $30 to the ton.

ITEMS.—*Weekly Star*, Aug. 28: In Tombstone district the Cincinnati claim has just had an immense ore body of rich carbonates opened up at the bottom of a 70-ft shaft. The Contention hoisting works are erected, and will soon be at work. At the Grand Central the 25-ft shaft at the north end is 8 by 12 ft in size and all on solid ore. The Lucky Cuss is being steadily and extensively worked in three different shafts of the present depth of 200, 100 and 20 ft respectively. Seven to eight hundred tons of good ore are out on dumps. The work on Tough Nut cuts in the gulch has been taken off on account of the rains, and concentrated on the deep shaft which contains a big vein and worlds of ore.

YAVAPAI MINING NOTES.—The Tiger mill is pounding away, day and night. Tiptop mill is running 12 out of 24 hours. Very rich ores are being raised out of the Black Warrior and Silver Prince shafts. Tunnels are being run into the Crook, at Crook canyon. Lively times at Seymour and the Vulture mill. Results of milling very satisfactory. The stream of bullion from the Tiptop mine is steady at $35,000 to $40,000 per month. Two quartz mills are being erected in Big Bug district. The Central Arizona mining company's mill at Seymour is producing gold bullion to the satisfaction of its owners, who are about to increase the mill to 40 stamps. The Bradshaw mill, in Bradshaw basin, will soon be running on ore from the Lorenzo and other mines. The Oro Bonito mill is working and paying well. The Cherry Creek mill will soon be ready to crush rock for hire. The Lynx Creek mill, running four arastras on Lynx creek, is doing well. The 10-stamp gold mill in Big Bug district is almost ready to work, and another 10-stamp mill lately brought here is being erected.

COLORADO.

ITEMS.—Georgetown *Courier*, Aug. 28: The shaft in the Lulu lode, situated on Red Elephant mountain, 1,800 ft west of Boulder Nest, has reached a depth of 260 ft, and two levels are now being driven east and west, the first at 200 and the second 250 ft depth. The first level has been driven west 85 ft and shows more or less ore the entire distance, the vein in places being 14 inches thick. The best ore is in the bottom of the level, which indicates that it has been run near the top of the pocket. The breast at present shows about six inches of ore and crevice rock mixed, which mills about 140 ounces. This level has been driven east of the shaft for a distance of 75 ft, the ore being scattered and consequently low grade. In places this level shows three ft of mixed stuff that mills from 40 to 60 ounces per ton. Between the two levels the shaft shows more or less solid ore all the way down, which mills from 150 to 300 ounces. East of the shaft for a distance of 20 or 30 ft above the second level there has been a cave which has exposed a fine vein of solid ore. The second level has been driven about 30 ft east and 15 ft west, the vein of solid ore exposed being small. Some new mines have been discovered in the Silver Creek mining district, eight miles southwest of the sawmill in Poncha pass, and six miles from Poncha springs. They are fissure veins in true porphyry and a number of them have been found to carry high grade ore. The principal ones are, the Mammoth with a 12-inch pay streak averaging 300 ounces in silver; the Olympic with 15 inches of pay ore that averages 100 ounces; the Maxwell with specimen assays of 275 ounces; the Poucha with two veins of galena ore, 8 and 12 inches thick, averaging 25 ounces, and the Little Lottie, an extension of the Maxwell, with a pay streak six inches thick of 231 ounces, ore. Eighty pounds of Mammoth ore sent to Leadville gave a return of 420 ounces.

ITEMS.—*Miner*, Aug. 23: In Treasure Vault and Glendale lodes, in the Clear Creek country, the vein has been proven a distance of 3,000 ft in length. The Glendale claim shows three ft of quartz wherever exposed, some of which assayed as high as 1,168 ounces of silver per ton. No. 3 lode of the Joe Reynolds' properties is yielding rich ore. The Cramer lease has ten inches of nearly solid ore, a late run of which milled 388 ounces for first-class ore and 142 for second-class. The Peruvian mine, in Summit county, has three shafts and a crosscut over 200 ft long, has been driven to strike the lode.

ITEMS.—*Boulder News*, Aug. 29: In the Little Pittsburg the ore has got better, and the pay streak stronger as the tunnel has been driven in, so that in the breast there is at present nearly a foot of tellurium which runs from $175 to $2,000 per ton. The Prussian, on the same vein as the Little Pittsburg, makes an excellent showing of tellurium, 2 or 3 tons per week are shipped, which are said to assay high. On the west slope of the above claims a rich find has been made, specimens showing crystallized free gold and tellurium. At Jamestown the Overland mine has 1,000 tons already out of the mine, assaying 6 ounces in gold and 8 ounces in silver. The Buenos Ayres, a silver-bearing vein, runs from 100 to 195 ounces per ton.

IDAHO.

ITEMS.—*World*, Aug. 29: The Yuba tunneling company at Atlanta are now in with their main tunnel 1,200 ft and will soon strike the great Atlanta lode at a depth of 1,300 ft below the surface. Messrs. Wiley Fox and John McDonough are taking splendid ore out of the east extension of the Sub Rosa mine. They have 30 tons on the dump that they think is good for $75 per ton. The Banner mine has been drained and the new tunnel connected with the old mine, which is in good condition.

MONTANA.

CLENDALE.—Helena *Independent*, Aug. 28: At the Hecla works and mines the crushers, blasts and 50-ton water jacket smelting furnace are now running. The production averages about ten tons of copper matte and bullion per day, the former being shipped to Germany, the latter to Omaha. The bullion carries about 450 ounces of silver per ton and the copper matte 300 ounces of silver and 50% copper. The incline on True Fissure is down 500 ft, and on Mountain Sheep 800 ft, the new mines yielding about 125 tons per week, and the new Atlantic with incline of 1,100 ft yields about the same number of tons. Inclines dip on an angle of 20°—3,000 tons of ore cribbed on dump. A tunnel will soon be started in the base of Lion mountain to tap mines at vertical depth of from 400 to 700 ft. A mine is being sunk on the Keokuk and Phil Shenon.

BELMONT.—*Miner*, Aug. 23: The Belmont mill and mine, of the Silver Creek district, give employment to 60 men, all told. The Belmont lode, although considered gold-bearing, nevertheless carries occasional "horses" of rich silver ore, a species of cayuse whose acquaintance the mine managers are in no way loth to make. Some time ago a Frue vanner was put in below the mill, to operate on the tailings. Twenty tons of concentrates, worth $150 per ton, have already been saved at a trifling cost from tailings which would have otherwise gone to waste. A pan is now being erected for the amalgamation of these concentrates, and operation to begin, likely, this week.

SILVER CREEK.—The following is an enumeration of the mills of the famous Silver Creek district, with the number of stamps at work in their respective batteries: Penobscot, 40 stamps; Belmont, 20 stamps; Whippoorwill, 10 stamps; Cotter & Hickey, 5 stamps; Magyar, 5 stamps; total number of stamps, 80. All the above named mills are employed in the reduction of gold-bearing ores, except the Magyar, which is to work by the silver process ore from a lode yielding handsomely in both silver and gold.

MADISON COUNTY.—A new district has been formed near the source of Barton gulch, where some valuable locations have been made of silver lodes. They are very rich. The recent discovery of some new leads in Summit district are developing richly in free gold. Red Bluff district is now yielding more gold than it ever did. New discoveries and increased development are proving it to be one of the substantial and productive districts of the country.

NEW MEXICO.

ITEM.—*Grant County Herald*, Aug. 23: The mines at Lone mountain are showing better the more they are developed. All the miners there are content and doing well. The mill is giving good satisfaction and is kept busy day and night.

OREGON.

BAKER CITY.—*Bedrock Democrat*, Aug. 27: At the Virtue mine steady progress is being made in taking out the water. The Superintendent informs us that in two weeks the 400 level will be reached, and in four weeks the water will be out to the bottom of the mine, when the sinking of the new perpendicular shaft will be commenced.

New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's office at San Francisco:

ORO M. & M. CO.—Object: To mine and mill ores in Arizona. Capital, $10,000,000. Directors—C. W. Osborn, P. Tuggie, R. B. Safford, W. B. Ready and E. R. Pope.

RICHMOND S. M. CO.—Object: To operate on Turkey creek, Yavapai district, Arizona. Capital, $10,000,000. Directors—A. Hemme, A. Waterman, R. B. Sanchez, W. H. Stevens and S. M. Van Wyck.

Requirements of the Age.

We publish herewith the substance of an address delivered by the Rev. Thos. Guard, at the Grand Opera House, upon the occasion of the opening of the Mechanics' Institute fair:

There has not been any dearth of exhibitions in our metropolis during the last few months. I cannot imagine a type of taste for which exhibitors have not most liberally catered.

There have been political exhibitions, and of these a greater variety than the creative genius of America had ever dared to produce; indeed, no less than a perfect quartette—soprano, alto, tenor, bass. I shall not venture to say which is soprano, and I shrink from suggesting which is the bass; nor am I prepared to say to what concord of sweet sounds this quartette may yet constrain us to hearken. The air around us is tremulous with melody, and the symphonic billows of this political quartette break in silver spray upon Mt. Shasta's slopes, blend congenially with the hideous howling of the Cliff-House sea lions, swell the cadence of the Vernal and Yosemite falls, and die into silence amidst the murmurs of the honey-laden bees that haunt the orange gardens of the City of the Angels.

And then there has been the far-famed Pedestrian Exhibition in the great pavilion of this Association. Who has not heard of that exhibition? From what classes of society were spectators not drawn, to witness the sublime feats of the contestants for the diamond belt? Who among us is competent to describe the extremely salutary influence of that pedal display? In what a chastely fascinating aspect it presented woman! What a winsome example it lifted to the admiring gaze of "our sisters, and our cousins, and our aunts!" What a refining agency was suggested to the lovers of American culture! In what an *economic* light it placed the female members of our families! "Hard times" may become easy of endurance if we can but train the limbs of our girls into speed of motion; and, hushing all the objections springing from their pure and gentle bosoms, urge them to the saw-dust ring and the voluptuous leers of lewd gamblers, where they may barter away the pearl of their womanhood for thirty pieces of silver.

Oh, yes! ours is a progressive age.

At last we have reached our own exhibition. And I congratulate you on this auspicious occasion. Our exercises to-day are a sort of *prelude*, to which I have the honor of contributing a note.

I am to offer you a few thoughts, suggested by our annual fair. It is impossible for any but the most frivously-minded to linger within the pavilion during an exhibition such as this without acquiring material for most remunerative study. Indeed, this is one of the many benefits which accrue from such an institution. It invites inquiry; it provokes discussion; it wakes the mind from stupor, and impels it to investigation; it excites the fancy; it regales the imagination; it refines the taste. And whatever elicits thought and compels the mind into meditative mood; whatever enlarges the *com*prehensive outlook, and strengthens the *ap*prehensive grasp of the understanding; whatever augments our control over the activities of the mysterious spirit within; whatever gives us enfranchisement from the tyranny of the senses, and independence of the pleasures which materialism ministers; whatever lifts us into the region of pure ideas, and wings us for flight o'er the serene and luminous realms of truth and beauty; commands our most fervent gratitude, as an educator of the human race.

If you ask me what is the prime and most masterful thought suggested by my visits to "The Fair," I at once reply:

The Sovereignty of Man.

(1) Everywhere, around, above, I recognize tokens of this; I look upon the tribute which, as a sovereign, man has extracted from nature. The dominion is a noble, it is a vast, it is a varied one. Here in the exhibition are proofs of man's sovereignty over winds and over water, over light and over heat, over chemic and over mechanic energies. From the marching season and the timely rains; from the hidden wealth of mountains and from the wealth more real of the generous soil; from the products of the forest and of the flock, and of the field, and from the products of the far-resounding sea; man draws revenues and service. Lightning is his courier, and light his artist. Trade-winds waft his white-winged argosies, and snows gather on Sierra crests to swell the floods wherewith his ample acres shall be irrigated. Flowers, by their weird alchemy, transmute dew and gases into aromatic odors for his delight; and change sunbeams and dull clays into hues emerald, purple, and roseate, wherewith to greet his kindling glance, as he moves out to gaze upon an inheritance, over which "far as the breeze can bear the billow's foam," it one day shall be true, man's nod is empire, and his footfall law. Silkworms spin for him; oysters secrete pearls for him; lime becomes marble and carbon diamonds for him; rocks are turned into silver, and plants become coal for him. Rivers leap to light from lofty fountains in the hearts of hoary hills, that, utilizing the law of gravitation, man may make them turn his ponderous wheels, and whirl his myriad spindles. The wild fowl "nurses" the plume that shall wave upon his victor helmet; and the cotton and the flax plant offer the fibers of which to fashion the banners beneath whose folds he shall move forth to conquest; or repose unharmed amidst the fruits of his free and honest industry. *Force* guards him—sows, reaps, threshes, and grinds for him, as in ages past it toiled in fashioning his dwelling-place. *Art* breathes inspiration. *Music* reveals her mystic laws to his modulating genius. The block becomes a thing of beauty. The canvass glows with the tints and flush of life. Arch and pillar, capital and dome, springs from earth and soar to heaven, obedient to his all but necromantic touch. Homer, wrapped in his singing robe, wet with the dews of the morning of the ages, chants his immortal epic, to find in the broadening centuries a whispering gallery, round which his melodies shall swell in musical thunder,—Dante, gentle as he is sublime, tender as he is stern—a violet in the rift of an Alpine glacier; or, the "Victoria Regia" of the middle ages; and Milton, blind with excess of light, laden with the lore of classic and of sacred thinkers, clarified by waters of sorrow, and chastened by fires of fierce scorn, his harp upon his shoulder, daring the Seraphim to a trial of their strength of passion and their sweep of thought—these all proclaim the extent and opulence of the sovereignty of man—all are his: the true, the beautiful, and the good.

(2). This *sovereignty* is based upon and maintained by *knowledge of*, and *obedience to*, the *laws of nature*. In our age it is superfluous to attempt to prove the unity and universality of law. The truth is axiomatic. The gem and the snowflake are crystallized according to law. The cloud floats and the bud bursts into blossom in accordance with law. Atoms combine, birds migrate, tears are molded, and planets wheel, obedient to law. Logicians reason, poets create, and orators persuade by reverence for law. "Her voice is the harmony of the universe, her home the bosom of God." Man must rule nature, in stern and strict conformity to the "constitution of nature." And so faultless is the constitution that no amendments are possible. Not amend nature's laws, but, know them and obey them, is man's duty, and "in the keeping of them" prove "there is a great reward." Man can, indeed, unite those laws; can effect a combination of several of them, and by so much augment his power. And this is being constantly done. Every building erected is the result of combination of many laws of nature; every organ built is another result of such combination of law's forces; every telescope is the product of many laws in combination; every strong man is a concentration of laws selected from the chief departments of nature's immense domain.

This Makes Science a Necessity.

(3) For to rule you must *know* the subjects ruled—their numbers, their natures, the conditions of their existence and well-being. Ignorance is incompatible with efficient government.

One of the most important points to be secured by the *civil* ruler is this: that he know the temper and the habits and tone of thought characteristic of the people ruled. The great Chatham *knew* the English people; and this made him supreme in the councils and supreme in the affections of his countrymen, who loved to speak of him as the "Great Commoner."

To truly rule *yourself*, it is of highest importance that you study and seek to know yourself. Therefore, "the proper study of mankind is man." Nor less is this true of the sovereignty now spoken of. All the sciences were included, therefore, in the decree,—"Have dominion, replenish the earth, and subdue it." Study the properties of plants and shrubs, of flowers and fruits, grasses and herbs. *Botany* is here. Study the properties of animals, of fishes, of birds, of beasts: their habits, their foods, their instincts, so that they may be utilized for commerce, or for domesticated ends. *Natural History* is here. Study the secrets of atmosphere and water; of heat and light; of soils and rocks; and of the mutual influences of all these upon organic life. What is this but *Chemistry*? And so of the *Mechanical Sciences*, and so of the science of *Navigation*. This at once proclaims the sovereignty of mind, thought, intelligence; and embraces all the progressive acquaintance with the facts and the forces of creation, gained by man during his process through the ages past, and yet to come.

The *clearer* the *mental* eye of the sovereign, the better equipped for the scepter of his empire. *Thought* is the ruler. *Ideas* are the conquerors of all things: physical, political, moral, and religious. The man of most ideas,—the man who knows best how to *express*, and *embody*, the greatest number of the greatest thoughts, is, by "Divine right," fittest to rule.

Subjugation is Demanded.

(4) All sovereignty wielded by man hitherto has been preceded by struggle and subjugation. I cannot rule myself unless I subdue myself. Self-conquest prepares the way for self-government. Full oft the struggle to subdue involves awe-inspiring efforts. The subjugation of the appetite and of the temper, and of the desires, of the tongue, of the senses and of the thoughts,—Ha! what battles are suggested by words like these. Marathon, Waterloo, Bunker's Hill and Gettysburg; these are but gala-day fights in comparison. No eye may have witnessed, no stranger have been cognizant of the strenuous, stern but sublime endeavor to put down and o'ermaster so as to rule the spirit with calmness and keep it in hallowed harmony. Only in the blaze of the great white throne, and when crowned by the all-seeing One at the last day, shall it be known how many the heroes whom history never emblazoned on her pages; whom poets never lifted to fame by their imperishable odes.

The freedom of to-day is the fruit of struggle. Freedom of thought in society; freedom of opinion in religion; freedom of action in politics;—all secured by struggle. Tortures endured, blood spilled like water, life offered without stint, without complaint. But so the fetter melted from the bondsmen; so the tyranny of superstition hit the dust of irretrievable defeat; so the despotism of Autocrats dissolves and "leaves not a wrack behind." Even so God wills it to be in the sovereignty referred to in my theme. "Subdue it," as He points to the sea; and man builds his breakwater and floats his navies. "Subdue it," as He points to the morass; and man begins to drain it, and build his causeways o'er it. "Subdue it," as He points to the forest; and man wakes echoes from the primeval shades with his axes, and kindles fires around the venerable monarch of the woods. "Subdue it," as He points to the Sierra; and man cuts out his iron pathway o'er them, tunnels his course through them, and waves his flag of triumph upon their loftiest summits. "Subdue it," as He points to the lightning; and man plants his conductors to draw down and tame its fire, and spreads his wires that o'er them the invisible and fleet-footed force may bear his message. "Subdue it," as he points to the wild horse of the plains; and man puts a bit in the mouth and bridle on the neck of the steed, until "a little child shall lead him."

Labor Demanded.

(5). The *struggle* for *existence* and for *sovereignty, implies* and *demands labor*. Work is demanded, both in the study of the facts and forces of nature, and in the development of the physical resources of nature.

It were a grievous mistake to imagine that none save those who fling the shuttle, or drive the plow, are laborers, or workingmen. Think you that the brave men who have gone forth to explore and discover the extent of the domain given to man for his possession, are not members of the guild of honest and noble workmen? Livingstone, Franklin, Kane, Baker, Stanley;—these not laborers as truly as the man who wields the hoe, and hews down the forest! No men have better right to their "spurs" than such knights as these. Think you that they who follow the comet, or foretell its approach; who bend over the crucible, and ply the scalpel; who untwist the sunbeam, and analyze the light-wave propelled by Sirius upon the shores of our small planet; that they who read the epitaphs carved upon the rocky tombs of fossil plant and Saurian monster; who watch the birth-hour of the tornado, and signal the moment of its advent of terror and desolation,—that these, and such as these, eat the bread of idleness, or sleep the sleep of the sluggard? Nothing is more remote from truth, than such a thought. Every furrow on their ample brows is the record of a *conquest*, as truly as that every crow's foot wrinkle round their eyes of unquenched fire is a scroll written over with fragments of "the fairy tales of science, and the grand results of time." Free from the law of labor man cannot hope to live. With cessation of the need of labor barbarism begins, and reversion to savagedom becomes a law of life. Naturally, man is lazy. He loves the idea of "labor-saving machines." Scientists, perhaps, might tell us, that in this indisposition to work, we prove our ancestry back to the South American sloth. Be that as it may, it is not good for man that he be exempt from the law of labor. The more one ponders the matter, the profounder the conviction of the divinity, the dignity, and the blessedness of work. It has the *approval* of my reason, the *sanction* of my conscience, the *well done* of my God. Working, I develop my being; I restrain my animalism; I win self-mastery. Patience is cultivated; perseverance becomes a a habit. Draining yonder marsh, I may be aided in draining one as sour within my own heart. Rooting out yonder briar, I shall be helped in checking the growth of a vice as pestiferous in the soil of my own spirit. And, knowing right well the drift and tendencies of my nature, the benign Father of all, "for *my sake*,"—for my WEAL, "*cursed* the ground;" *not* CURSED LABOR;—the philosophy of which, it is not my business now either to discuss or to defend.

Again we say, labor is the law of life. All things living, on earth or elsewhere, move in harmony with it. From God, who worketh ever, upholding, renewing, restraining; consoling, inspiring, defending; bidding worlds from nothing into being, and feeding the fires of ever-burning suns, from age to age; nerving saints for heroic battle against wrong, and welcoming them from their fields of toil, or their furnaces of martyrdom, into quietness and assurance forever;—from this God, down to His tall angels, who now work in bearing up a little one along his path, lest he dash his foot against a stone, and again work in wafting the spirit of a pauper upon their unmoulting pinions, whither the storms of this world cannot travel, nor its mist of darkness float; down to the coral-builder that faints not, neither is weary in its toil masonic beneath bright tropic skies, and cheered on in its silent labors by the choral chantings of Pacific waves,—Labor is life—is gladness—is beauty. And let the thought be repeated and emphasized—the labor of life is a *battle*. It is a fierce strife Vigilance ever demanded; forethought in ceaseless play. For floods challenge, tempests call in trumpet tone, and drought, and locust, and prolific weed-growth dare man to wrestle with and vanquish them. And if man were as wise as he might be—then should be hail the struggle as his opportunity for achieving that "to which the whole creation moves—"MORAL MANHOOD—SELF-SOVEREIGNTY]

The peril in our midst is great in this particular: That work shall be deemed ignoble. But, in truth, in no land beneath God's generous sunlight is honest toil more honorable than in this free country. The spirit of gambling has been in our atmosphere quite long enough for the health of our sons and daughters. It creates feverishness, restlessness, impatience, contempt for slow, steady processes and deferred results and profits. We would move, but when swept by lightning express, or "two-twenty trotters." The old method of honest, intelligent, persevering, plodding toil, as that by which honor shall be won, competence gained, and well-being realized, may have served in generations past. But young Californian Americans cry out against all such "old fogeyism."

No thoughtful observer can have failed to recognize in this fair an illustration of the *laws* of co-*operation* and *division* of *labor*. These products had never been, but for diversity of gifts in the endowments of men; diversity of adaptation as the result of those endowments; and then, *union* of *all these*, in endeavors to supply the wants of humanity.

Single-handed, single-hearted—how feeble is man! What a narrow map of survey; what a superficial acquaintance with the facts within that circumscribed domain! What hope can he cherish of victory over nature's forces single-handed. The highest type of animal life presents us with the greatest diversity of organs and functions co-operating to one end. The loftier the life, the greater the number of forces focalizing to sustain such life. The functions of the lowest living thing are fulfilled by one organ. Loftiest life is nourished by a score. Savage life, as contrasted with civilized, illustrates the same principle. It is before us most truly in our exhibition. There is the product of the worker in iron and the worker in marble. There is the flockmaster with his wool, and the grape grower with his wines and raisins. There is the manufacturer of blankets, and the producer of beeves, of butter, and of beet root. There is the spinner of steel wire and of hemp rope, by the former meeting the needs of our street car companies, and by the other supplying the demands of that extremely necessary adjunct to our civilization—the common hangman. There is the tooth extractor, with its pleasures of hope, and the toy for the infant just cutting its teeth. There are Cinderella slippers for fairy-footed belles, and there are the no less fair and fairy edifices, "castles in the air,"—called bonnets. There are sweatmeats for "billing and cooing" lovers, and preserved meats for sallow-cheeked, dessicated and melancholy bachelors. There are crystal goblets, from which to quaff that elixir of life, and home of living things, called "Spring Valley water;" and then there are brooms, and "combination mops," over which Mrs. Partington must shed tears of ecstatic joy, and large enough to sweep into limbo all the cobwebs that ever clustered in the antique corners of an old City Hall, and cleanse the filthiest floor o'er which the disgusted members of a political caucus expectorated their contempt and chagrin, in tobacco juice. Here are cradles, in which may he rocked into dreamland the future saviours of their commonwealth; and here are revolving lounges, upon which the fathers of these precious creatures may gyrate, as they study the problems of statecraft and of the Stock Exchange. Here are materials for the printing press, and for the circulation of opinions that are reformations in embryo, and revolutions in the germ. And here are organs and pianos—for man longs for rest, and yearns to forget his woes; and would fain voice his hopes, and antedate his immortality, in that etherial speech called music. And here is our "gallery of the fine arts." For man is made for "the beautiful." Nor is he satisfied with the provision for his craving, furnished in the forms, and colors, and motions of creation. There is no stint, it is true, in nature's supplies. There is the tint of the fox-glove, and the gleam of the gem—and the pomp of the cloud-storm, and the grandeur of the snowy peak, and the mirror-like repose of the land-locked lake, and the plumage of tropic bird, and the majesty of sunset, and the swell of the foam-wreathed billow, and the serenity of eve, and the valley all afire with morning sunbeams, steeped in pearls of dew. Yet, this is not enough. And the artist must extract from these their fairest, their purest, their noblest; and of the extract fashion scenes not more true to nature than they are true to the loftier ideals with which imagination loves to commune.

THE PERFECTION OF NATURE'S WORKS.—Upon examining the edge of the sharpest razor with the microscope, it will appear fully as broad as the back of a knife—rough, uneven and full of notches and furrows. An exceedingly small needle resembles an iron bar. But the sting of a bee seen through the same instrument exhibits everywhere the most beautiful polish, without a flaw, blemish or inequality, and ends in a point too fine to be discerned. The threads of a fine lawn are coarser than the yarns with which ropes are made for anchors; but a silkworm's web appears smooth and shining, and everywhere equal. The smallest dot that is made with a pen appears irregular and uneven; but the little specks on the wings of insects are not only found to be perfect and regular, but to often show elaborate designs of a detail which is the admiration of the microscopist.

Hydraulic Gold Mining in Georgia.

Going seven or eight miles up the Yahoola river, a dam was built where the stream rushes through a picturesque gorge, whence a small ditch six feet wide and six feet deep was led along the side-hill, in and out of all the curves, sometimes through a short tunnel, then across an aqueduct, here and there, wherever its level led it, at a grade of four and a half feet to the mile, 20 miles down to the mines. This is the main big ditch. It has two or three large branches, and there are other lesser ditches throughout the region, supplying separate isolated mines, but none have so elevated a head or carry so great a volume of water as this, and it is the best of them all. When first constructed, there were many flumes and trestles along its line. Some of the trestles were over a hundred feet high, of great length, and a constant expense to keep in repair. At one spot an attempt was made to cross the bed of the Yahoola where the hight of the trestle would be 250 feet, and its length nearly half a mile. By a lavish expenditure of money the structure was carried to the hight of 150 feet, when it was found that the lower timbers had already rotted out. The scheme was therefore abandoned, and the vast erection demolished, entailing a loss of almost $200,000. Engineers say that, with all the appliances and force which could be brought to bear there, it would be impossible to build a high trestle as fast as it would decay at the foundations.

In place of this, iron pipes were substituted, and an inverted siphon made. The descent from the top of the hill is at angle of 45°, and is 215 feet in length; the pipes then cross the bed of the stream upon wooden supports a distance of 167 feet, and ascend the opposite bank 200 feet. The pipes are made of heavy boiler plating, and are 36 inches in inside diameter. Through them the water rushes with a pressure of nearly 100 pounds to the square inch at the bottom, and that is sufficient to overcome the friction and lift the column of water on the other side to within six feet (and perhaps nearer) of the level of the starting point. It was found not long ago that some men had been accustomed for a long time to shoot through these pipe sticks of cord-wood, cutting them on the mountain opposite their home. Finally they got to running whole logs through; but one was too long and got stuck, which led to the detection of this labor-saving fraud. At other points subterranean wooden tubes of equal caliber, similarly arranged, conduct the stream across the valleys. One of these tubes is 1,500 feet in length.

Having got this tremendous "head" of water at their disposal by the completion of the ditch, stamp mills were built far below it in the valleys, at points suitable to the best diggings, and they were ready to begin operations upon the new system. The cutting having been opened at the brow of the hill, a reservoir is constructed, in which water from the ditch is allowed to accumulate to the amount of thousands of gallons, whence a side ditch, controlled by flood-gates, leads to the upper edge of the cutting. From the mine downward a channel is arranged, as precipitous as possible, leading directly to the stamp mill, where a room is open to its entrance. If now a torrent should suddenly be poured into the cutting, away up there on the edge of the mountain, which seems almost to overhang you, it is evident that all the loose material would be swept out and sent headlong downward to the bottom of the hill. What a natural freshet would accomplish by accident is precisely what the miners do by artifice. They dig away all day at the loose soil and easily disintegrated rock, break up the larger fragments into small pieces and straw everything, good, bad and indifferent, in a careless pile on the floor of the cut. Then at sundown they gather up their tools, climb out of the diggings, and open the gates of the reservoir. A torrent sweeps through the mine, cleans out every loose rock and fragment of dust and hurls it down into the mill, where a rack catches all the coarse material and lets the water drain through into the much-tortured Yahoola. The whole product of the day's excavation has been deposited on the floor of the mill, half a mile away, ready to be shoveled under the stamps, which chew on it all night, and it has not cost a penny for transportation. —*Ernest Ingersoll, in Harper's Magazine for September.*

Japanese Spheres of Rock Crystal.—The difference between glass and pebble is that pebble is a better conductor of heat than glass, and therefore feels, like all other gems, colder to the tongue than their glass imitations. This is test No. 1; test No. 2 is to look for air bubbles; if with a magnifying glass you discover the minutest air bubble, it is certainly glass, as in natural stones air bubbles are never found. Test No. 3 is the hardness; a piece of a steel file will scratch glass, but it will not scratch pebble or other precious stones. Test No. 4 is polarized light; a piece of glass placed between the polarizer and analyzer of a polariscope does not show anything peculiar, while any part of a crystallized substance will show either variable colors or at least changes of light and darkness when its position is changed, the dark spots showing the direction of the axis of crystallization.

Electrical Letter Boxes.—Among the recent applications of electricity is an attachment to street letter boxes, so arranged that if an attempt is made to rob the box an alarm will be instantly sounded at the nearest police station.

Useful Information.

Saponifying Mineral Oils.—A new process, says the *English Mechanic*, has lately been patented in England, which is said to prove satisfactory in saponifying the mineral oils. The patent applies not only to those oils which are found native, such as petroleum, but also to those that are obtained from coal, schist, asphalt and other minerals. In order to render such oils capable of saponification, they are first acidified by the addition of concrete fatty matter, either animal or vegetable, and the mixture is then saponified in the usual way by the addition of alkaline lye. The soaps thus produced may be varied in hardness and solidity according to the nature of the fatty matters and lyes employed: but in all cases they are powerfully detergent and disinfectant, and baths formed by them do not putrify even after use. Such being the general nature of the new and improved process, the manner in which it can be practically carried into effect may be best explained by a particular example: Assuming the oil to be treated to be rectified oil of petroleum and the concrete fatty matter stearic acid, the latter is melted in a water bath, and poured into the petroleum, which is at ordinary temperature, the stearic acid being added to the petroleum in the proportion of about 15 parts of the former to 100 parts of the latter by weight. After thorough mixture, by stirring for a short time, the compound can be saponified in the usual way. It is, however, of advantage to combine it, before saponification, with animal or vegetable fatty matter; a good proportion for such combination: two of the acidified petroleum to three of the fatty matter. Either soda or potash may be used to saponify the compound, producing a benzine soap, which may be made hard or soft according to the alkali and the proportions adopted in the saponification.

Repeating Matches.—A patent has been taken out for a repeating match—that is, a match that may be struck a great many times, and yield a light each time. The match consists of two rods of inflammable composition, placed side by side in two compartments, with a suitable case. In order to strike the light, a scraper is moved by hand along a platform across the open ends of the two rods. The scraper removes a certain quantity of its substance from each rod, and mixing these together the light is produced. One stick is composed of three parts chlorate of potash and one part of clay, thoroughly mixed and formed into a thick paste by the addition of water, then dried. The other stick is made of three parts amorphous phosphorus and one part of clay, prepared in the same manner.

Crystals From Cast-iron by Ether or Petroleum.—On treating comminuted cast-iron with these solvents, on the spontaneous evaporation of the liquid, the author obtained acicular crystals, consisting principally of sulphur and absolutely similar to those extracted by the same process from meteoric iron. M. Berthelet, to whom the author had forwarded specimens of the crystals, stated that he had obtained similar bodies by the action of pure ether upon octahedral sulphur and upon anhydrous iron sulphides. It thus appears that even neutral solvents do not in all cases act by simple solution upon the bodies with which they come in contact, but effect also a chemical alteration.—*Scientific American.*

Incombustible Wood.—M. M. P. Folharti claims that he has discovered a method by which wood of any kind can be rendered incombustible. It becomes, as it were, petrified without any alteration in appearance. Intense heat chars the surface, slowly and without flame, but does not penetrate to any extent, and leaves the fiber intact, whereby in case of fire the fireman would have no occasion to fear that the materials on which they tread would give way beneath them, if this operation has been undergone by the wood composing the staircases, floors, etc.

Carbolic Acid for Weeds.—Some of our exchanges recommend carbolic acid as a destroyer of perennial weeds in lawns. The acid of the shops is diluted and poured from a bottle into a hole in the crown of the plant, made by a pointed iron. We have found a drop or two of strong sulphuric acid sufficient to kill instantly such intruders in lawns as plantains, dandelions, etc. The carbolic acid, largely diluted with water, is recommended for garden walks, applied with a brush or watering pot.—*Country Gentleman.*

A strong waterproof and flexible cement for joining sheets of manilla paper to form a board, can be made as follows: Good pitch and gutta-percha (about equal parts) are fused together, and to nine parts of this are added three parts of boiled oil and one-fifth part of litharge; continue the heat with stirring until thorough union of the ingredients is effected. This is applied hot, or cooled somewhat, and thinned with a small quantity of benzole or turpentine oil.

To Soften Putty.—Slack three pounds of stone quicklime in water, then add one pound of pearlash, and make the whole about the consistence of paint. Apply it to both sides of the glass, and let it remain for 12 hours, when the putty will be so softened that the glass may be easily taken out of the frame.

A New Preservative Compound.—It has been found that the double borate of potash and soda has antiseptic properties. The compound is made by dissolving equal quantities of chloride of potassium, nitrate of soda and boracic acid; filter the solution, evaporate to dryness, and keep in a tight bottle, as the salt becomes wet in the air. It is claimed that this salt has no effect on the smell, taste or healthfulness of the substances to which it is added. It has been tried for preserving meats, making sausages, butter and for tanning skins. Added to milk it will keep for a week; also added to beer or wine it retards the deterioration to which the inferior kinds of these drinks are subject.

Imitation Meerschaum.—Imitation meerschaum pipes are now manufactured from potatoes in France. A peeled potato is placed in sulphuric acid and water, in the proportion of eight parts of the former to one hundred of the latter. It remains in this liquid 36 hours, to blacken, is dried with blotting paper and submitted to a certain pressure, when it becomes a material that can be readily carved. The counterfeit is said to be excellent. An imitation ivory, sufficiently hard for billiard balls, can be made by still greater pressure. A resemblance of coral is obtained by treating carrots in the same manner.

Purification of Mercury.—The mercury is shaken up with an equal volume of a solution of five grammes potassic bichromate in one liter water, with the addition of a few c. c. of sulphuric acid, the operation being continued till the water becomes of a pure green. A strong current of water is then introduced into the flask, which washes away a green powder. This process is repeated if needful, and the mercury is finally agitated with distilled water till its surface remains perfectly bright.

Good Cement.—Gutta-percha cuttings are very useful for the laboratory. By dissolving them in benzole, and adding a little carmine or any other pigment, a solution is obtained which, when brushed on the cork and neck of a bottle, forms a tight-fitting cap, impenetrable to air, dampness, alcohol or acids, and can be taken off without difficulty.

Postal Card Ink.—an excellent invisible ink for postal cards can be made by diluting sulphuric acid with fifty times its volume of water. A slightly acid fluid is the result, which does not injure a quill pen. The message is developed by holding the card over any convenient flame—that of gas or spirits for example—or by laying it on a hot plate.

Cure for Burns.—An iron foundryman recommends powdered pine-wood charcoal as "a never-failing, grateful, and speedy remedy" for burns and scalds.

Good Health.

Blood Examination in Diphtheria.—Prof. Bouchut made daily enumerations of the blood corpuscles in all the cases of diphtheria that came under his observation within a period of six months, the number of analyses amounting to 177, and from the results obtained he has deduced the following conclusions: In severe septicæmic, or malignant diphtheria, there is always an acute leucocythæmia or increase of the whites corpuscles of the blood, which increases as the disease progresses, and diminishes when convalescence sets it. On the other hand, in the mild cases of diphtheria without septicæmia, there is no leucocythæmia, and the children always recover. In 24 cases studied day by day through the whole course of the disease, the number of white globules varied between 5,000 and 10,000 in 12 out of 93 analyses, and between 10,000 and 100,000 in the other 81, the average being 26,824. Prof. Bouchut insists on the necessity of daily examinations of the blood, as the number of white globules may be normal in one day and greatly increased in the next. He claims that valuable prognostic data may be gathered from the examinations, a rapid increase of white globules indicating the occurrence of septicæmia, and pointing almost positively to a fatal termination, while a persistence of the normal relations between the red and white globules indicates a mild form of the disease, and almost certain recovery.—*Medical Record.*

Iodine in the Treatment of Malarial Fever.—In corroboration of Dr. Willibrand's assertion that iodine is a specific remedy for malarial disease, comes the evidence of Dr. J. W. Wadsworth, Saltillo, Mexico, who has treated over 300 cases of intermittent fever with this drug. He has records of 260 of these cases, many of them being chronic cases extended over various intervals of weeks or months. In the severe cases, 10 to 15 grains of quinine were given at first, followed by compound tinctura of iodine, M x. to M xv.; in the severest cases arsenic was added. In every case the paroxysm was arrested within 24 hours, and 12 doses, or four days of treatment, were sufficient to guarantee a cure, with the exception of eight relapses, six being on the 14th day, one on the 21st, and but one on the seventh. In not a single instance, though under the most miserable hygienic surroundings, did there occur a failure to effect an immediate cure, when the medicine was taken as directed. Quinine and arsenic have often failed the writer, but iodine never.—*N. Y. Medical Journal.*

Poisoned by Nicotine.—A rather unusual case of poisoning by nicotine occurred lately in a Parisian suburb. The victim, a man in the prime of life, had been cleaning his pipe with a clasp knife; with this he accidentally cut one of his fingers; subsequently, but as the wound was of a trivial nature he paid no heed to it. Five or six hours later, however, the cut finger grew painful and became much swollen; the inflammation rapidly spread to the arm and shoulder, the patient suffering such intense pain that he was obliged to betake himself to bed. Medical assistance was called in, and ordinary remedies applied ineffectually. The sick man, questioned as to the manner in which he cut himself, explained the use to which the pocket-knife had been applied, adding that he had omitted to wipe it after cleaning his pipe. The apparent mystery that surrounded the case was thus cleared up, and, as the patient's state had become alarming, he was conveyed to the hospital. Upon his admission, the doctors attached to the institution declared that in the immediate amputation of the arm lay the only hope of saving the patient's life. The poisoned member was therefore amputated; but, in spite of the promptitude with which the operation was performed, the man lies in so precarious a condition that the chances of his recovery are said to be slight.—*Parisian.*

Bright's Disease and Ice Water.—A Baltimore druggist of experience and ample opportunity for observation, has advanced the idea that Bright's disease is attributable to the immoderate use of ice water and cold drinks. He cites the fact that the people of this country use 90% more ice in their drinks than the people of any other country—the inhabitants of Greenland not excepted. We have 75% more of Bright's disease. He cites the fact that the wine-drinking countries of Europe are comparatively free from the malady. Travelers have observed and commented upon the prejudice which seems to exist against ice water and iced drinks in all countries outside of the United States. The Englishman and the German fairly shun ice, though placed in easy reach of boundless quantities of it, and a Frenchman who sips the light wines would as soon think of taking an emetic as of chilling his stomach with an iced draft. Our drug friend points to the fact that Bright's disease has kept pace in this country with the increased consumption of ice, and claims that before ice became a common household necessity the malady was scarcely known among physicians. There may be something in this theory.—*Baltimore Gazette.*

Hygrometric Influence of Trees.—From some observations relative to the comparative influence of leafy woods and resinous woods on rain and the hygrometric state of the air, it appears that pine forests have a much greater influence on the hygrometric state than others; so that if the vapors dissolved in the air were apparent like fogs, we should see forests shrouded in a large screen of moisture, and in the case of resinous woods the envelops would be more pronounced than in that of leafy woods. Pines retain in their branches more than half the water which is poured upon them, whereas leafy trees allow 50% of the precipitated water to reach the surface of the ground. It is suggested, therefore, that in planting with a view to oppose inundations, it would be advisable to choose by preference resinous trees, as offering a better covert.

To Save from Drowning.—Never approach a drowning person from the front, but take him from behind by the hair, and never allow him to grasp any part of your body if you can possibly avoid it. Should he do so sink at once to the bottom, when he will release his hold on you. Only a good swimmer should attempt to rescue a drowning man in deep water; for a novice to try it is to imperil a second life with little chance of saving the first. Better hasten to secure a rope or a pole, or plank, which throw to the person in danger. This will give him a better chance of escape. If possible, let one going to the rescue have a rope tied under his own arms and held by some one on shore, or tied securely to some firm object. Young swimmers should use great caution.

Arsenical Dolls.—A shopkeeper in a small place not far from Berlin bought a doll dressed in a green muslin frock, from a peddler for his child, aged one year and a half. The latter repeatedly put the doll into its mouth, as babies often will do; and a few days later showed very grave symptoms of some illness which the doctor could not define till he happened to cast his eyes on the doll. The frock was immediately sent to the next chemical laboratory, where it was found to contain a quantity of arsenic sufficient to injure even an adult. The police succeeded in discovering the peddler and the name of the firm where the doll had originally been bought.—*American Med. Bi-Weekly.*

Tartrate of Morphia.—Dr. John E. Stewart, in the Edinburgh *Medical Journal* for March, advises the use of tartrate of morphia as the best preparation of the alkaloid for hypodermic injection. It is a white powder, not unlike hydrochlorate of morphia, forming a milky solution in cold water, but a clear one in hot water, in the proportion of forty grains to the fluid ounce. It is claimed that the solution is perfectly unirritating, does not need filtering or neutralizing, and keeps fresh and unchanged for any length of time. It is recommended also for administration by the mouth.

MINING AND SCIENTIFIC PRESS

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SAN FRANCISCO:
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Business Announcements.

New Edition, Webster's Unabridged Dictionary, G. & C. Merriman, Springfield, Mass.
Hand or Power Quartz Stamp Mill, Collins Eaton, Chicago.
Situation Wanted, Taylor & Co., 512 Washington st., S. F.
Assessment Notice, Butte Hydraulic M. Co.

The Week.

Information derived from various sources indicates continued activity and prosperity in the mining business. There is scarcely a county in the State that is not continuing its developments of precious mineral resources. Ledges of good paying ore are found in many unlooked-for localities, while old mines have been re-opened and found rich enough to justify the outlay of capital for machinery and other improvements. The movement is quiet, but is nevertheless assuming huge proportions. Everything argues a return of mining prosperity upon a more solid basis than that of mere speculation. The mines are being worked for what they will yield in actual output and not used as paper mines. The outside States and Territories are making efforts to attract capitalists by fabulous assays of small specimens as samples of millions of tons. Inaccessibility afflicts many mining localities largely advertised, and numberless mines, each of which, from reports, contain enough solid gold and silver to double up the world's supply, are offered in market at wonderfully low figures.

Maine, Virginia, Georgia, Arkansas and Iowa from late accounts seem to be advancing in the scale of gold and silver-producing States. Nova Scotia likewise desires it to be distinctly understood that there is gold and silver within her borders.

The Philadelphia mint during the month of August coined a total of $2,233,497, to $3,720,000 coined by the San Francisco mint. Bullion deposite for August at the San Francisco were 134,558 ounces of fine and crude gold, and 163,601 ounces of silver. There was in addition 320,870 ounces of crude silver deposited for refining. The enormous amount of gold coin flowing to the United States from Europe suggests the possibility of a revival of prosperity which is undoubtedly needed. We have labored and waited and are now beginning to get a return from our bread cast upon the waters.

The Golden Harvest.

There seems to be a disposition on the part of some Eastern mining journals to underrate the mining capacity of California. And we have noticed in connection with this spirit a great desire to exaggerate the value and output of mines in other States and Territories, which are to a great extent controlled by Eastern capitalists, or in which the East is directly interested, by reason of contiguity or marketable nearness.

In early days, when California was dependent on the East for supplies, there was none of this spirit manifested. On the contrary, California was the Utopia of the predecessors of the present mining journals. But since California has become self-supporting and independent of outside markets, the current of opinion concerning her prospective brilliant future is sought to be diverted into other channels.

From a business point of view it is, perhaps, policy to seek new advantages when old ones have been found unremunerative, but in so doing it is unnecessary to exhibit sentiments of jealousy, so far as to depreciate that which the world knows is increasing in value instead of diminishing. We are intrinsically coemopolitan in the broadest sense of the word, and have no jealousy. Our prospects forbid it. We welcome all capitalists who come to this coast, and lay bare to them our resources, keeping nothing in the background. Our mines possess an intrinsic value, and if we do not throw upon the market, at one transaction, railroad stock to the amount of $76,000,000 it is because we have more solid and certain investments.

Our Mono county mines are not dependent upon sensational articles and extravagant assays for their success. The heavy bodies of rich ore now in sight, the new discoveries being made in the opening up of veins and ledges, sufficiently demonstrates the true value of that region, when we also consider the energy now displayed in working the mines. In the Bloody Canyon district, on the western slope of the Sierras, careful prospecting has developed rich ledges. The Golden Crown shows an assay of from $143 to $201 per ton at a depth of four feet, with a ledge 25 feet wide. There are many other locations, and croppings can be traced a distance of four miles. The ores are called antimonical silver ores, and grow free as they go down. With every advantage in the way of wood and water, this district will add largely to the wealth of Mono county. The wealth of Placer county has hardly been diminished by former mining operations, and is now on the point of being developed by Eastern capitalists, who propose to work on the middle fork of the American river on a large scale and sure financial basis. The old quartz claim near Humbug canyon has been re-located, and good looking rock is being taken out. The old Pioneer ledge in the same vicinity is about to be tapped by a tunnel, and the rich rock taken out through it. Machinery has been put up on the West Damascus Gravel claim, at the head of the north branch of Shirttail canyon, with a view to go to bedrock. Everywhere in Placer county renewed energy is being displayed in developing and working claims which were supposed to be worked out, but which are now known to have been merely skimmed.

In Sierra county new and rich developments have been made at Poe's camp. Ledges of rich ore are abundant, assaying $60.27 gold and $13.15 silver, and from two and one-half to six feet in width; with plenty of water and timber, the prospects of this county in its mining capacity bids fair to come up to the standard. In addition to precious minerals, it may not be amiss to mention an immense ledge of marble about five miles from Meadow lake, which has an average width of 390 feet by one mile in length.

Nevada county is increasing in mining activity, particularly Lowell Hill, which is in a prosperous condition, with 75 men employed in drifting the various claims. Other localities in this county present an improved condition of things. The miners of Butte county are engaged in cleaning up, with exceedingly good results.

Los Angeles county contains gold-bearing ledges; one in Shrewsbury canyon near Anaheim is claimed to be very rich. Placer mining at Lytle creek remunerates at the rate of from $6 to $7 per day. The silver ore taken from Silverado, and assaying as high as 80 ounces per ton, is very similar to the Leadville ore, and requires the eye of an expert to detect any difference.

Throughout the length and breadth of the State of California, an unusually careful prospecting has lately divulged resources in precious minerals which have been entirely unlooked for. The assays that have been made indicate a reasonable credible amount, which the output verifies and exceeds in many instances. Our local mining journals present none of the exaggerated, sensational articles so common to many regarding outside localities. There is more reserve on their part, having learned by experience that deception brings many sorrows. The reason of the activity displayed in the development of our mines cannot be attributed to any speculative frenzy, but to a well settled purpose of making our mining interest a safe, paying industry. Improved methods of working ores, and extracting gold and silver from those that are refractory, has all to do with the re-opening of abandoned claims, and the facilities for working have increased so greatly that miners have been urged on in their endeavors, until valuable discoveries have been made, and new and rich ledges added to the already long list. If Eastern capitalists are willing to believe the enormous assays that are made in the ores of Utah and Colorado, which vary from $50,000 to $192,000 per ton, and invest their money, they have that constitutional privilege. But when capitalists are beginning to learn that these sensational assays drop to $30 to $40 per ton under the stamp, at an expense almost equal to the reality, and prefer to engage in the more satisfactory mining interests offered in this State, where opportunities are so much more favorable, we certainly have the right to argue against the jealous spirit that seeks to underrate what has not been exaggerated, and expose the impolitic plan of rule or ruin where control cannot be had.

Mining Decisions.

In 1871 the New Idria Mining Company applied for a patent upon 480 acres of mineral land situate in Fresno county, California. The application was rejected because, first, some of the necessary steps in the case were taken in direct violation of the orders of the proper officers of the Interior Department. Second. The evidence was defective in not showing that the proper notice and diagram were posted upon the premises, and in not identifying the claims alleged in the petition or advertisement. Third. There was not sufficient proof of the citizenship of the claimants, and the amount of land claimed exceeds that authorized by law. The mines claimed were alleged to be situated within the limits of the Rancho Panoche Grande, and the right to a patent on behalf of the New Idria was questioned both in Congress and in the courts by William McGarrahan, the alleged owner of the rancho. The Supreme Court, however, in 6 Otto (U. S.) decided that McGarrahan had no right to any of the land under the Panoche Grande claim, as it was fraudulent and invalid. Pending the McGarrahan contest the Surveyor-General of California, and the Registers and Receivers had received instructions from the Interior Department not to receive any application for mineral lands within the boundaries of the Rancho Panoche Grande. Despite these instructions the Surveyor-General and the Register and Receiver at San Francisco, caused a survey to be made of the tract claimed by the New Idria company, and received the application to purchase the same, publishing the notices required by the act of July 26th, 1866, and received payment therefor.

This was the first objection for rejecting the application for the patent. On review it was proved that the mineral land claimed was not within the rancho lines, and hence the departmental instructions had not been disobeyed.

The claim of 480 acres was in excess of the quantity that could properly be located by the parties from whom the New Idria company derive title. The location was made in supposed conformity with the rules and regulations of the San Carlos district, adopted Dec. 4th, 1854, which, however, authorized a person or an association to hold only 160 acres of land bearing silver or quicksilver ore. The original locators, Pitt, Collins, and Balenger, supposed they could take separately 160 acres each, or an aggregate of 480 acres, which they could not do, but only to the extent of 160 acres in all. The New Idria deriving title from them could not acquire any greater rights than were possessed by the original locators, and hence Secretary Schurz agreed with the decision of 1871, in this respect.

The defect in proof of citizenship was cured by the mining act of May 10th, 1872, which in the case of a corporation is made by filing a certified copy of their charter or certificate of incorporation.

The evidence, however, was still defective in not showing the date on which the proper notice and diagram were posted on the mine, and the date on which it ceased to remain so posted. The application for a reconsideration of the decision of Aug. 4th, 1871, and the issuance of a patent to said company for the tract claimed, was therefore denied by Secretary Schurz, July 26th, 1879.

In the case of Sayer *et al.*, vs. The Hoosac Con. G. and S. M. Company. The plaintiffs presented an adverse claim to the application of defendant for a patent for 1,500 linear feet of the "Dolly Varden," Secret Canyon Mining District, Eureka, Nevada. It appears that the 60th day of publication of notice of the application fell on Sunday, September 16th, 1877, and that at 10 P. M. on the previous day, Mr. Sayer presented his adverse claim and tendered fees to the Register of the Land Office, who refused to receive either. That on the following day, Sunday, Mr. Sayer again presented his adverse claim to the Receiver, who accepted it, filed it, and received the fees for the same. On contesting the claim, the Commissioner of the General Land Office decided that the adverse claim having been filed on Sunday a *dies non*, it must be regarded as having been filed on Monday, Sept. 17th, one day too late and rejected it. On appeal, however, Secretary Schurz held that in the absence of a law to the contrary, an adverse claim may be filed on Sunday, or out of office hours, if the local officers are willing to receive it, and accordingly reversed the decision of the Land Office.

The World of Improvement.

Our exchanges are filled with improvements, in the economical and practical devices which have been adopted by the mechanical and scientific world. Mons. Tellier, a French engineer, read before a late session of the French Academy of Sciences a paper on a new method of employing steam in engines. Constructors have hitherto aimed at keeping the steam as dry as possible. M. Tellier, however, admits heated water direct into the small cylinder of a compound engine, and claims in this way to generate double the quantity of steam with the same amount of coal, and obtains this apparent paradoxical result from the fact that the formation of steam no longer takes place in the boiler, but in the cylinder of the engine, for which reason, the disturbance inseparable from ebullition is no longer to be feared.

The inventor states that by this means the highest useful degree of heat can be obtained without excessive pressure, and that the condensed steam can be brought to reproduce effective steam at 284° Fahr. It is calculated that the best compound engines constructed on this principle will not consume more than 1 pound 12 ounces to 2 pounds 3¼ ounces of coal per horse-power per hour.

Russia has had constructed for artillery, divisible guns, which can be divided into several parts for transportation. Experiments with small calibre guns have led to the construction of large calibres to be used for mountainous regions.

A ship canal is contemplated across the peninsula of Florida, for the accommodation of ships bound to and from the various sea-ports on the Gulf of Mexico, and to avoid the shallowe and dangers of the Bahama channel. The canal will start from Cedar-Keys, on the gulf, and proceed in a straight line to a point on the Atlantic between Jacksonville and St. Augustine.

The value of aluminium in telegraphy has been for some time well known, and has attracted special attention from the fact that it possesses double the conducting power of iron, and can be drawn into extremely fine wires for various purposes. Its high price has heretofore been an obstacle in the way of its general use. A German exchange says it can be produced in large quantities, and at small cost, by reducing it from the cryolite of Greenland in smelting works by means of silicions iron or zinc ore.

The digging of the canal from Cronetadt to St. Petersburg is progressing so rapidly, that the Russian government has been assured that vessels of light draft will be able to reach the capital by next summer. Its depth will be 30 feet.

Several months ago, M. Thallon constructed a new spectroscope, containing compound sulphide of carbon prisms, by means of which be effected a very much greater dispersion of light than had been attained previously. With its aid he has produced a remarkable map of the solar spectrum, which contains about 4,000 lines, in a length of 33 feet. The well-known map of Angstrom contained 1,600 lines in a length of about 12 feet.

Leclanche's battery has been improved by dispensing with the porous vessel heretofore used. It has a high electro-motive force and low internal resistance, and is a useful battery where not used on a closed circuit, or where the circuit is often closed.

A series of experiments with the Westinghouse brake have been lately made on the North Eastern Railway, England, with a view to determine the question of the friction of rolling bodies, and to test the value of the friction valves. A train going at the rate of 50 miles an hour was brought to a standstill within 200 yards. Another, going at 60 miles per hour, and a pressure of 70 lbs on the inch, was stopped in about 200 yards. The experiments were highly satisfactory. The Hollway process of using sulphides as fuel, heretofore described, is causing considerable discussion in Europe on account of its great economy.

In Paris, France, the animal and vegetable refuse from markets, and refuse of all kinds, has been calcined, and forms what is known as "Paris charcoal." A furnace for that purpose has been designed by an Eastern inventor at Stamford, Conn., for utilizing all these waste products. The mineral matters melt and form vitreous scoriæ, which flow outside, where they are converted into powder or fine sandy grains, or, if desired, converted into mineral wool.

American machinery continues in favor in Europe, particularly in Russia; also in South America. Locomotives, in particular, being in demand in Russia. European journals are filled with complaints concerning the influx of American machinery and products, and many plans are suggested to counteract them, but nothing has yet occurred to stay the importations.

An outcry has been made in England because of railroad discrimination in favor of American freights.

THOMAS W. BOOKE & Co.'s sheet iron and tin plate works near Cardiff, Wales, in constant operation since 1740, have been closed, throwing 1,500 persons out of work.

IN San Francisco half dollars are quoted at 99½ buying, 99¾ selling; trade dollars, 97 buying, 98 selling; Mexican dollars, 98 buying, 98½ selling.

The Victoria Regia.

The reigning queen of water lilies, shown in the engraving on this page, is of interest, both for its rank in the plant kingdom, and from the fact that it is now flourishing in California waters, having been successfully grown from the seed in the Golden Gate Park Conservatory in this city. A large artificial pond has been especially devoted to the fine plants secured, and they are now in vigorous growth of leaf and flower, the pride and admirationof San Franciscoans.

The Victoria Regia leaves are from six to eight feet in diameter, and the stem which bears them up is a hollow tube as large round as a stout woman's wrist. From the stem ribs shoot out which are two inches in depth and regular compartments are formed by intersecting ribs, resembling nothing so much as the frame work of a house. Spines project downward from the ribs, which are very sharp, necessitating wary handling. The leaf is green on the surface, and a purplish red beneath. The fleshy part is very thin and delicate, so much so, indeed, that the least impression will puncture it, while the leaves as a whole, thanks to the compartments underneath, which are filled with air, is very buoyant and capable of sustaining astonishing weight. A healthy baby 12 months old may be laid on one of them with security, and a plank stretched over two of them will bear up easily a full grown man. Its growth under the water is exceedingly interesting, as each day the leaves shoot out and make for the surf ace so fast as to create the delusion that one can see them moving or lengthening. Around each leaf, when fully developed, is a rim, which gives it the appearance of an immense floating dish. A niche or opening in this rim is a curious natural provision against disaster.

The flower of the great queen lily possesses many interesting features. It is from 10 to 12 inches in diameter. It lasts in perfection only two days, but the rapidity with which they succeed each other on a healthy plant makes amends for their brief existence. They bloom only at night. About twilight the petals open with a sudden jerking motion, one after the other, and close up promptly at daybreak. On the first day the flower is pure white, which changes on the second to an exquisite shade of rose pink. These flowers are very rare even in England, the country of their adoption, and £60, or $300, is a moderate price for a fair specimen.

A lady of our city, Mrs. Anna Gettz Lucas, has made an especial study of the Victoria Regia, having ably reproduced the flower in wax. She has also compiled many interesting facts from the literature of the lily, and from her writings we shall take the following facts: The Victoria Regia, though indigenous to the climate of tropical America, growing in its magnificent beauty in the river Amazon and its tributary streams, is claimed as an English production, was named for its reigning Queen, and brought to the Royal Gardens at Kew; successfully cultivated also at Chatsworth by the Duke of Devonshire early during Victoria's reign. Its original discoverer was a German scientist named Henke, who found it growing in the marshes beside the Rio Mamore, a branch of the Amazon river, as early as the year 1801. Sir R. H. Schomberg made a scientific visit to British Guiana, January 1st, 1837, and while sailing in a canoe up the river Berbice, he was astonished to see, for over a mile of water, that the whole basin of the river was overspread with huge, round, curiously margined leaves and hundreds of magnificent, white and rose-tinted flowers, each measuring over a foot in diameter, scenting the whole atmosphere with a rich perfume like the pineapple. The natives called it "Y'repa," or Water Platter. The plants at Kew flowered in 1851, and between June and November produced 61 flowers.

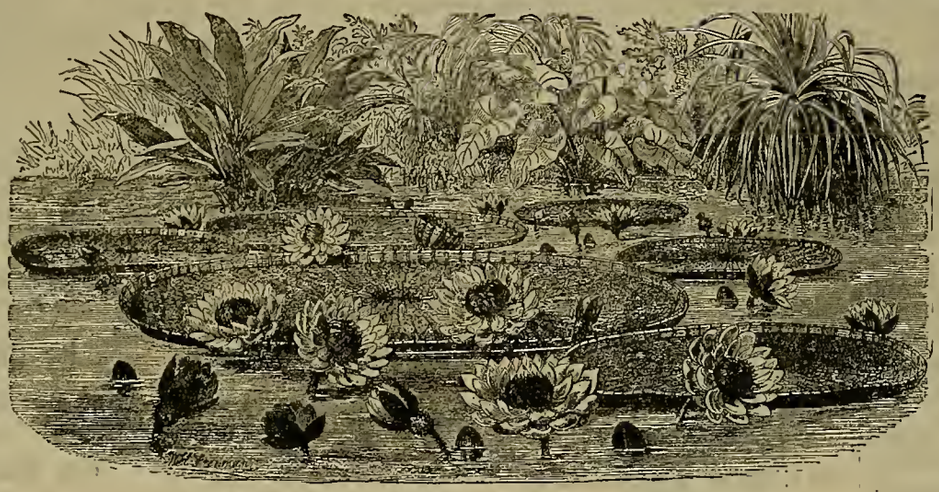
The root is a large spindle-shaped tuber, with bundles of fibrous rootlets attached, which appear with every bud and leaf. The leaf is a bright green above, and a dull crimson below, with a rim several inches in width. The ribs are very prominent, almost an inch high and are eight in number, with similar ones branching off from them. The stem is in the center of the leaf, fully an inch in thickness, and has a brown, thorny appearance. The leaf is produced in a cycle of five. Twenty-five or 26 leaves appear before the flower bud. The leaf is from 10 to 13 feet in size; the flowers from 12 to 18 inches.

The flower stem is over an inch thick near the calyx, thickly studded with thorns about an inch long. The calyx is four-leaved, upwards of seven inches long and three inches broad, thick at the base, creamy white side, reddish brown and thorny outside, measuring from 12 to 17 inches in diameter. The pistils and stamens are numerous, the stamens growing like pointed scales around the pistils, the outside row, 30 in number, forming a crown around the rest. The color of the stamens is a brilliant yellow tipped in crimson. The flower petals are from 50 to 60 in number, or three distinct sets, each growing smaller near the stamens. The first row next the stamens are of a brilliant rose color, spotted and flecked with crimson. The fruit, when ripe, is half as large as a full-sized human head, and is full of seeds. The natives of South America call it "mayz de l'agua," for from its seeds a farina is produced from which a paste cake is made, which they consider a luxury.

The first flower raised in the United States was at Springbrook, the country house of Caleb Cope of Philadelphia. His plants were raised in 1851, and the same plants lived for several years. One of them flowered 200 times. The plant was exhibited in 1865, near the Central park, New York, and during that summer produced 70 flowers.

The plants now growing at the Golden Gate park, seems strong and vigorous, likely to produce magnificent flowers, the conditions of this climate being favorable to its growth. It is grown from seed raised in London. We are indebted for the specimens now on exhibition at the Fair to the kindness of W. S. Munree, the gardener at the conservatory.

Popular interest has been greatly increased in the plant from the fact that large leaves, cut from the Park stock, are now shown in a tank at the Mechanics' fair in this city, and attracted much attention. When the flowers are opening at the Park the conservatory is kept open until midnight and lighted so that the people can visit the lily queen. Her votaries have been many, and Victoria Regia may be proclaimed the belle of the hour.



THE VICTORIA REGIA AT GOLDEN GATE PARK, SAN FRANCISCO.

Coals and Lignites.

In speaking of the coals of the North Pacific coast, they have usually been called *lignites*, to distinguish them from the coals of the carboniferous period, mined in Ohio, Illinois, Pennsylvania, and Great Britain. The *Daily Astorian*, published at Astoria in Oregon, says the name is an unfortunate one, because while the word *lignite* implies that the coal is of woody origin, it is now proved that these coals are not formed from wood to any greater extent than are the coals of the carboniferous period. Nor are they inferior coals, as sometimes designated. Coals of every quality and for every purpose can be found in the so-called lignite coals of the North Pacific. Vancouver's Island, good gas coal; Seattle, excellent grate and parlor coal; steam and parlor coals are found at Mount Diablo; while at Wilkinson, good blacksmith coal is obtained. Bituminous, semi-bituminous, and even anthracite coals are found in this region, all in the same lignitic period. Within 23 miles of Astoria, south, exist large veins of coal as good as the Sydney coals for steaming, and better than Seattle or Coos Bay for grate and parlor use. The *Astorian* proposes hereafter to drop the word *lignite* as too poor a name, and speak of these coals by their right name—*coals*, of the best quality.

South Yuba.—A tunnel is being constructed through a point of land on the south side of the South Yuba river, Nevada county, Cal. A mining flume is to be placed in it for washing the tailings continually passing down the river from the claims above. The tunnel is of a capacity sufficient to carry the entire volume of water and gravel passing through the flumes of all the mining claims discharging into the river above it. In addition to the tailings, a large portion of the river bed is to be laid bare and made available for mining purposes. The large amount of water, boulders, etc., prevented operations in early times, beyond demonstrating the fact that very rich pay dirt existed. The quantity of tailings is immense, and said to be rich.

Since the yellow fever broke out at New Orleans, July 22d, there have been 17 cases and five deaths.

Technical and Industrial Education.

Some points made on this subject by our exchanges are worth the consideration of all interested in the solution of the educational problem. The subject of education in relation to its bearings upon points of public as well as private utility has enlisted many in the cause of the technical part of it, as a solution of many of the difficulties which are attendant upon the existence of a large unemployed class of citizens, or whose employment is unremunerative. Machinery is doing our drudgery for us, and now man, lifted by it out of the slavish toils to which he was accustomed by the introduction of labor-saving and automatic machinery, must either elevate himself to a higher standard of skill or fall back into utter degradation. There is hardly any medium, and hence the importance of an industrial schooling.

The advantages of technical education have been made more apparent in Europe than in the United States, because of the greater difficulty in securing remunerative employment. The ability of labor counts for little. Skill is at a premium everywhere.

Mr Huxley says: "If a lad in an elementary school showed signs of special capacity, I would try to provide him with the means of continuing his education after his daily working life had begun. If in the evening classes he developed special capabilities in the direction of science or of drawing, I would try to secure him an apprenticeship to some trade in which those powers would have applicability. Or, if he chose to become a teacher, he should have the chance of doing so. Finally, to the lad of genius, the one in a million, I would make accessible the highest and most complete training the country could afford. Whatever that might cost, depend upon it, the investment would be a good one. I weigh my words when I say that, if the nation could purchase a potential Watt or Davy or Faraday, at the cost of a hundred thousand pounds down, he would be dirt cheap at the money. It is a mere commonplace and everyday piece of knowledge that what these three men did produced untold millions of wealth in the narrowest economical sense of the word."

Barnes' Educational Monthly argues that "Technical education supposes that a child must be educated for the sphere he is expected to occupy in life. Advocates of a purely technical education use frequently such phrases as 'laboring classes,' 'station in life,' 'educated classes,' 'cultured society,' 'upper classes.' Whether this is wise in republican America as in monarchical Europe remains to be seen. Experience has shown that it is exceedingly unwise to suppose that a certain boy is to make a Congressman, while another will peg boots. The issue usually shows that the young lawmaker makes a cobbler, while the predestinated bootmaker becomes a foreign minister. Some of our very best and most learned men were not intended by their parents to occupy very high stations in life. It is dangerous to 'suppose' very much in reference to any boy in this enlightened age." Every boy and man has a genius for some particular pursuit. It should be the endeavor of educators to ascertain this genius or inclination by experimental studies and develop that one alone. We are running to specialties, and only extraordinary men can compass generalities, and even then are more in the nature of encyclopediaa than profitable every-day consulters.

In New York Government bonds are quoted at 101½ for 4s of 1907; 102½ for 5s of 1881; 104½ for 4½s; sterling, $4.82@4.84; silver bars, 112½; silver coin, ½@1 discount.

At Glasgow, Scotland, 1,000 cotton operatives have struck.

The Portuguese Consul at Pernambuco has been assassinated.

Progress of the American Silk Industry.

It is beyond question that the silk manufacturing industry of this country is making notable progress. As we have stated before, while the production of raw silk in this country is restrained by many conditions, the manufacture of silk goods from imported raw material is going forward rapidly, and is succeeding in placing its products on the market with such traits of excellence that the foreign silks are taking a lower rank in the estimation of purchasers. Although we sincerely desire that in some way the production of the raw material may ere long demonstrate its practicability, so that our silk industry may be wholly American, it is gratifying that the manufacturing branch of the industry should be going forward, for this signifies the employment of a large number of operatives, and the money which our wealthy silk purchasers spend is going for the support of our own people rather than for the enriching of foreign nations.

An excellent compilation of facts and statistics concerning our silk industry is contained in a handsome volume, published by D. Van Ostrand, of New York city, under the auspices of the Silk Association of America, and written by W. C. Wyckoff, Secretary. The work is entitled the "Silk Goods of America," and it enters minutely into the causes and effects which mark the progress of the industry. It is but characteristic of American enterprise that the aid of improved machinery should have been already invoked, and it is true that our silk manufacturers now have fine power looms working with precision, while foreign makers are still laboring with rude hand appliances. In this country all sorts of fabrics are now made on power looms, from gossamer veiling to upholstery brocatelle, and goods are made with perfect uniformity of quality not attained by hand operations.

In the manufacture of silk thread, known as "sewing silk" and "machine twist," our factories have succeeded so well that foreign competition is already distanced. This branch of the industry is thriving on this coast as well as in the Eastern States. The method which our manufacturers have employed to secure a triumph for their silk thread, has been the high standard of purity which they adopted. Instead of loading the fiber with adulterants to increase its weight at the expense of strength, they determined to sell a pure, or standard dye silk. The result has been as we have said, the American-made silk thread has won the day, and those who use it not only encourage home manufacturers, but they consult their own interests by getting the better article. Foreign producers are now urged by their newspapers to adopt the American system of honesty in production, or their business will fail. This is a very significant fact. American-made sewing silks cannot be surpassed in delicacy, brilliance and permanence of hue.

One very interesting fact which is fully set forth by Mr. Wyckoff in his book, is that the raw material used by American silk makers is better than that used in Europe. He shows conclusively that American manufacturers are obliged to use the best raw silk as a simple measure of economy. The cost for labor in this country is so high that all the foreign manipulations, by which poor raw material is made to look like good when in the thread or fabric, are too expensive to practice in this country. In other words, the extra cost of the best raw silk is less than the cost of the labor required to "doctor up" the poor. Then, too, the best raw silk works well in machinery, and fabrics can be made rapidly, while the poor is continually breaking and the machinery has to be stopped to tie the ends. Thus time is lost and less work is done by the machine in the day.

In all styles of silk goods, American enterprise and machinery are winning their way. The manufacture began a few years ago with some simple lines of manufacture. It has progressed to such an extent that nearly all kinds of silk goods are produced of unrivalled excellence. It is estimated that from a fourth to a third of the plain silks and a much larger proportion of the brocade silks which are consumed in this country, are now made here. The production of figured dress silks has attained large development within a very few years. The designs are mostly original, and no mere description can do justice to the beauty and variety of these fabrics. In producing grenadines and satins, the improvements have been equally striking. Ribbons of the most elaborate designs and most perfect finish are now made in this country by power looms, and they have superseded the foreign hand-made ribbons, being so superior that French makers compliment us by imitating American tickets, trademarks and designs. The finest silk laces are also made upon American machines. In short, the American silk manufacting industry may be fairly regarded as thoroughly American in its character and methods, and highly creditable to those who are pushing it forward.

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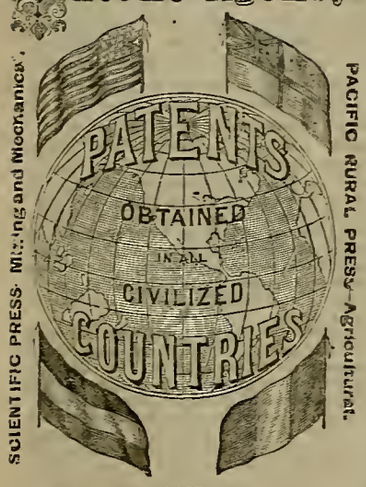

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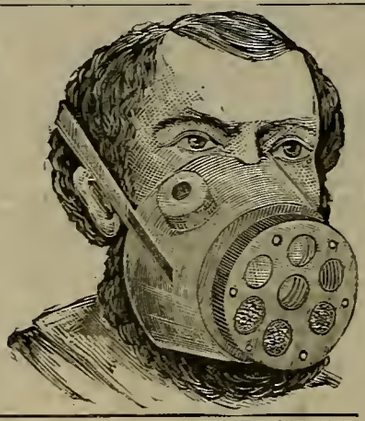

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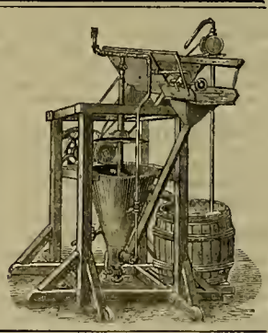

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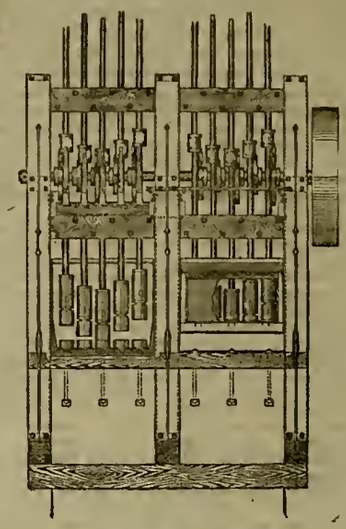

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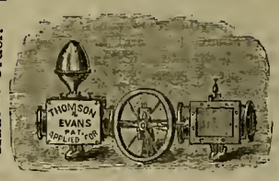

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The Mechanics' Fair.

The following ars some among the most interesting exhihits in ths fair:

Manufacture of Metallic Laths.

Mr. Chas. H. Carter has a machine for manufacturing metallic laths at work in ths machinery department of the pavilion, both the form of the lath and the machine heing of Mr. Carter's invention, recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency. Metallic laths have heretofore heen formed in sheets in a series of corrugated pieces, adapted for placing on broad, smooth places. The new metallic laths are made singly, and have a curved central portion with extending flanges, hy means of which they may bs attached to the wall. They are made iu long strips, each one separate, and may be put in place like ordinary wooden laths, and weigh about as much. When placed side hy side, the space formed hetween the raised portions of the lath produces a depression which forms the hend to hold the mortar in place.

The machine for forming the laths is a simple though ingenious piece of mechanism. A sheet of metal of snitable dimensions is pushed under the plates from oue side. The eccentrics, as the shaft is rotated, force the sliding plates down, thus forcing down ths oppositely placed levers. These levers force down the upper edges of the swinging presser plates, the lower sharpened heveled edges of which squeeze the overlapping edges of the metal plates from which the laths are formed down over the rounded edges of the former, and into a crevice on each side. The eccentric again raises the swinging plates and separates their lower edges, releasing the lath, which may he drawn out, and a new piece of metal inserted.

The laths, thus formed singly, csn be put upon any surface, and formed or bent to fit corners or angles; while they at the ssme time provide a perfectly fire-proof wall and a hond to hold the mortar in place. The Carter lath is now heing put iu the new Hall of Records in Oakland, and will no douht come rapidly into use in all buildings designed to be fire-proof.

Bruckner's Ore Mill.

There is on exhihition, in the display of Prescott, Scott & Co., in the fair, oue of Mr. Bruckner's ore pulverizing cylinders, a machine of which some 80 are in use in Europe, and which is now meeting with the favor here, which experience ahroad has induced. The machine was invented some two years ago hy the well-known metallurgist, Mr. Bruckner, to replace, if possihle, the costly and cumhersome plant necessary for crushing hy the ordinary stamp battery so much in vogue on the Pacific coast; and from the facts, which are from the experience of a considerable period, our readers can judge for themselves of its value.

It is constructed somewhat on the principle of the ordinary holt-polisher, with which every machinist is familiar. It consists in the main of a cylinder four feet long and four feet in diameter, in which a number of iron halls are placed, and which, when the machine is charged with ore, is rotated, to produce the necessary grinding. The cylinder is constructed of flat steel rails of ahout three and a half inches in width, placed hoop-like at distances of 3-32 of an inch apart, and securely fastened together hy iron hraces. The ends of the cylinder are made of strong sheet iron. The ore is charged hy any continuous feeder through one of the trunnions on which the harrel turns. Around the cylinder and fastened to it is placed a cone of cast iron, so that the pulverized ore falling through the apertures hetween the rails is caught hy the cone and carried hy gravity to the part having the greatest diameter. Here is placed a hollow, annular riug, which forms a natural depository for the ore. This ring contains two cylindrical sieves. The one is made of strong punched iron or steel, and is made with 18 holes. This simply serves to protect the other, a wire screen, which is placed heneath it. This screen is usually a No. 30.

The next object is to remove this pulverized ore, which after having passed the No. 30 screen lies at the lowest part of the outermost compartment of the annular ring spoken of above. This is effected hy a curved tuhe or channel of cast iron, which runs from the bottom of the outer compartment along the end of the cylinder to the hollow trunniou opposite that at which the ore entered the cylinder. With such an arraugement it is evident that the revolution of the cylinder will naturally discharge the pulverized ore through the hollow trunnion. By a similar arrangement all the ore which has passed the No. 18 sieve, hut not the No. 30, as well as that which was too coarse for the No. 18, is taken hy a similar tube and discharged hack into the cylinder itself for repulverization. A little reflection will make the working plain, and it is evident that the whole operation is automatic, and that with a proper ore feeder no attention whatever is required to the apparatus. In a cylinder of the dimensions given it is usual to work with about 1,500 pounds of iron halls. The cylinder is rnn at a speed of from 15 to 22 revolutions per minute. A 5 to 7 horse-power engine only is needed.

Perhaps the testimony of Mr. Arnold Lohse, a practical mill man, and chief engineer at La Barranca, Sonora, whsre two of thess pulverizing mills have heen used for two years, will show practical results hetter than anything. He says: "The one at the mill, which is 48x48, discharge screen No. 35, running 27 revolutions per minute, grinds 20 tons of silver ore in 24 hours. Power necessary to propel it is 7 horse-power. The one at the mine is 48 diameter by 36 length of harrel, run at 22 revolutions per minute. Discharge screen for sizing ore for concentrators are 16, 12 and 8, and grinds 30 tons in 24 hours. Six-horse power propels it easy. The repairs are not more than on batteries, and to say the least, your pulverizer is bound hefore long to dismiss the use of batteries in mills." The cylinder is usually run in connection with a Blake Stone-Breaker, and can be fed with anything from two to four inches in diameter. It will crush either wet or dry, and in the former case the water may be used over and over agsin, a great advantage in dry districts. Besides the advantages presented, there are some which have heen hinted at only, and are evident from the arrangement of the machine. There is no useless work done. As soon as the ors is crushed fine enough to pass through the slits between the rails it passes out, and there is not that useless waste of energy so constant in the stamp hattery. Also, ths ore is not ground to that impalpable fineness which gives such a loss in the slimes of all our ordinary amalgamating contrivances. Next, the wear and tear of the parts is small. Machines of this kind, with a capscity of two tons in 24 hours, can he purchased for $250. One with a capacity of 20 tons costs $2,000. Mr. W. Bruckner, No. 328 Montgomery street, room 16, csn furnish any further particulsrs if desired.

Waste Pipe Cut-Off.

In the machinery department of the fair, near the hig engine, is exhibited a wsste pipe cut-off and valve for water closets, recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency hy Levake & Gruhh. This closet has s metal seat, and dispenses with an overflow, providing for valve overflow, making it a sure preventive of sewer gas entering dwellings in which the closet is placed. It also dispenses in new work with traps of all kinds, which are usually worse than useless, giving a feeling of safety which does not exist. In these closets a direct connection is always maintained hetween the outlet valve and waste pipe, and any leakage occurring, passes into the waste pipe and not into the howl. When the closet is not in use the lower discharge is always connected with the waste pioe, and no overflow is necessary in the lower bowl, since, as the valve is closed, there is no connection with the upper pipe, it heing tightly closed. In case the waste pipe should become stopped, all that is necessary to do is to raise the fall enough to open the inlet valve and allow the full pressure of the water to flow through the lower discharge pipe into the waste pipe, where the pressure will force the pipe clear. By this action the bowl continues closed, and no sewer gss or odor can arise, while the water may he allowed to flow as long as necessary through the waste pit. The waste pipe cut-off and valve may he attached to hasins, hoppers, or wherever a waste pipe is run. The mechanical construction of the device, though simple, is very effective in accomplishing the purpose.

Home Made Hardware.

Morris & Son, of No. 1045 Market street, make an exhibit of a few articles, all of which are of their own invention and practically introduced. Of these the pneumatic hell is prominent. The elasticity and mohility of atmospheric air fits it for hecoming, under suitahe appliances, the most perfect medium known for sending signals and ringing a hell. Morris' hell is rung hy means of pressing air by a common hell pull through a small metal pipe or tube leading to the hell. It does away with all wires. For steamhoats it is particularly useful, since in the case of wires hreaking frequent accidents occur. They show a steamboat bell with a detector attached. This consists of a small hell in the pilot house, which rings when the engineer's bell does, hut when the latter fails to ring the detector does not, so the captain or pilot will know it immediately. The pneumatic hell is in use in the Board rooms of the S. F. stock board, having displaced an electric hell. The Morris door knob, recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency, as was the bell also, is exhihited. This door knoh is adjustahle without any screws or washers, and fits any thickness of door readily, hy a very ingenious and simple construction. It has been adopted in the new city hall, and is rapidly coming into use. The firm also show an improved lock invented hy them and of home manufacture. It is a five-tumbler lock, very light and strong. It is adapted for prison locks, as well as for general use where care is to he exercised. Morris & Son also manufacture locks and hinges, hronze work, nickel-plated goods, as well as hells, knohs, etc.

WM. HAWKINS, of 210 Beale St., exhibits in running order his improved elevator hoist, patented through the MINING AND SCIENTIFIC PRESS Patent Agency not long since. The only gold medal awarded at the fair last year was given for this machine. A long revolving screw carries the cross-head to which the hoisting ropes are attached, thus hoisting the elevator steadily and easily, without any jerk or jar.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS TO DEWEY & CO.'S MINING AND SCIENTIFIC PRESS PATENT AGENCY.]

FOR THE WEEK ENDING AUGUST 26TH, 1879.

218,930—CAR COUPLING—C. Chisholm, Los Angeles, Cal.

218,938—HORSE POWER—H. M. Cox, Linden, Cal.

218,975—CULTIVATOR, HARROW AND SEED SOWER—James Hugill, Woodbridge, Cal.

218,977—WINDMILL—M. C. Jackson, Alvin, Cal.

218,992—PEACH AND PLUM PITTER—J. Lyon, Placerville, Cal.

218,995—COMBINED BOOT AND LEGGING—P. McNulty, S. F.

219,018—BLACKING-BOX HOLDERS—L. F. Reichling, Oakland, Cal.

219,028—RAILWAY TRACK LUBRICATOR—F. P. Smyth, Cuffey's Cove, Cal.

218,918—ELECTRIC AMALGAMATOR—J. O. Stewart, Alameda, Cal.

219,050—MINE DRAINING APPARATUS—J. R. Wilcox, S. F.

7,628—CIGARS—Trademark—M. P. Kohlberg & Co., S.F.

7,629—CANDLES—Trademark—Lavenson, Winter & Co., S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent hussiness for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently ohtained throngh Dewey & Co.'s SCIENTIFIC PRESS Americsn and Foreign Patent Agency, the following are worthy of special mention:

IMPROVED CULTIVATOR, HARROW AND SEED-SOWER.—James Hugill, Woodhridge, San Joaquin county, Cal. Patent No. 218,975. Dated Aug. 26th, 1879. This invention relates to an improved farming implement, hy which the ground is harrowed, cultivated and seeded at one operation, therehy saving a grest deal of time and expense for farmers. The construction of this machine is simple and not liahle to he easily hroken; it consists of two large rollers arranged to operate independently of each other, rotating freely upon an axle which is journalled in a frame; on the outside of these rollers are placed in diagonal lines a series of teeth. Behind these two larger rollers is a small one having teeth arranged so as to keep the teeth on the large rollers free from lumps, and is connected to the larger rollers hy means of a set of gears. Near the rear end of the frame is arranged a seed-trough in which the seed is placed and dropped as required, and afterwards covered hy means of teeth secured in the rear beam of the frame.

AUTOMATIC MINE-DRAINING APPARATUS.—Joseph R. Wilcox, S. F. Patent No. 219,050. Dated, Aug. 26th, 1879. This invention relates to an improved apparatus for raising water from mines, wells, etc., and consists in providing two sets of three cylinders each, one set inside the minc and the other set outside, the latter being placed at a lower point than the inside set. Each set of cylinders is placed in line, so that one piston-rod may carry three pistons, one for each cylinder. Two pipes connect with opposite ends of each of the central cylinders, so that a continuous pipe leads from one end of the inside central cylinder up and down into the mine, connecting with the outer end of said inside cylinder, thus forming a continnous double water colnmn when said pipes are filled and sealed.

HORSE-POWER FOR OPERATING PUMPS.—Henry M. Cox, Linden, San Joaquin county, Cal. No. 218,938. Dated Aug. 26th, 1879. This device consists in the employment of a bevel or crown wheel, which is fixed upon a hed with its teeth uppermost. A central spindle arises from this wheel, and an arm or lever mounted upon this spindle extends across ahove the gear wheel, having an attachment for the horse at one end, while a pinion at the other is mounted to rotate upon its axis hy meshing with the teeth of the large wheel while the lever is carried around hy the movement of the horse. A crank-arm upon the pinion is nnited hy a pitman and universal joint with a halance-beam ahove, and the action of the crank causes it to oscillate so as to operate a pump at the opposite end. This device is simple and easily constructed.

COMBINED BOOT AND LEGGING.—P. McNulty, S. F. No. 218,995. Dated Aug. 26th, 1879. The object of this invention is to provide a combined hoot and legging adapted to fit over the pantaloons and fit the ankle and leg symmetrically; and it consists in a hoot having one side of the leg narrow and the other side projected toward the front to a sufficient width to wrap over the front of the leg onto the other side of the boot leg, the sides heing provided with fastening devices, and connected at the front with gore of thinner material, and lapping over when the leg-flap is secured.

RAILWAY-TRACK LUBRICATORS.—T. P. Smyth, Cuffey's Cove, Mendocino Co., Cal. No. 219,028. Dated Aug. 26th, 1879. This device relates to a novel method for preventing the retarding friction which usually occurs hetween the moving trains upon railways and the rails where curves exist; and it consists in the application of water to the rails and wheels in such a manner as to prevent in a great measure this rstarding friction, while at the ssme tims allowing sufficient direct adhesion for the purpose of traction.

News in Brief.

ROBERT BONNER is now the owner of "Rsrus."

AFFAIRS in Hayti continue in a trouhled condition.

THE had state of sffairs coutinues at Constsntinople.

THE British resident at Mandalay has been withdrawn.

THE Chilean Minister of War has tendersd his resignation.

A TERRIFIC hail-storm occured Friday at Fort Keogh.

DURING August 2,787,059 standard silver, dollars were coined.

THE excess of exports over imports during 1879 is $263,572,089.

ANOTHER party of farmers left Livsrpool last Saturday for Americs.

THE puhlic debt statement shows a decrsass in August of $527,395.

A BROTHER of the Pope died at Rome, Ssptemher 2d, of apoplexy.

THE Austrisn hudget this year shows a deficit of 21,000,000 florins.

"MOLLIE MCCARTY" is broken down and will probshly never run again.

SPECIE in the Bank of France decreassd 1,527,000 francs the past week.

THE coal minsrs of the Cumherland rsgion in Pennsylvania, are on a strike.

DON CARLOS denies that he has compromised his claims to the throne of Spain.

EX-QUEEN ISABELLA will attend the wedding of Alfonso and Archduchess Marie.

WHOLESALE arrests were made at Houston, Tex., for violating the quarantine laws.

SILVER in London, 51⅝d; consols, 97 11-16; 5% U. S. honds, 105⅝; 4s, 104⅝; 4½s, 108½.

THE state of siege in the recently disturhed districts of Bulgaria will shortly be raised.

THE interest at the East in regard to the De Young-Kalloch husiness has ahout died out.

THE deaths at Memphis from yellow fever to date numher 233—183 white and 50 colored.

IN Staffordshire, England, 50,000 workmen are affected by the recent reduction in wages.

THE death of John Adams Jackson, the American sculptor, is announced from Florence.

A LETTER from Tangier announces the death of a brother of the Emperor of Morocco by poison.

GEN. TODLEBEN, Governor General of Odessa, is to he relieved by Prince Don Daukoff Korsakoff.

A RAILROAD is soon to be huilt from Austin, Nev., to the Central Pacific, a distance of 90 miles.

THE Oneida commnnity has heen compelled hy puhlic sentiment to ahandon its free love system.

AT Liverpool wheat is quoted at 8s 6d@9s 6d for average California white, and 9s 5d@9s 10d for cluh.

SINCE August 12th $4,000,000 in gold has been received at the New York assay office from London.

ENGLISHMEN at Constantinople strongly protest against the proposed new taxes on foreigners in Turkey.

STEAMERS leaving Europe dnring the last three days for New York have on hoard $5,500,000 in gold.

TROUBLE is reported in the States of Coahuila, Durango and Chihuahua, Mexico, over disputed mining ground.

THE numher of gallons of spirits produced dnring the fiscal year 1879, is 71,892,617, against 56,103,053 in 1878.

THE President will enforce his order in regard to the active interference of Federal officials in political conventions.

THE coinage at the Philadelphia mint during August amounted to $2,233,497, of which $1,876,050 was in silver.

THE programme of the prize shooting at Creedmoor contemplates 19 matches, with an aggregate value of $7,277.

ALL the gamhling houses in St. Louis are to he closed after Sunday night, under the new law, which is very strict.

GENERAL GRANT does not desire to he President again, according to a letter from him to the Hon. Elihu B. Washburne.

RICHARD STEVENSON, United States Deputy Marshal, was shot to death last Saturday by a horse-thief, near Wellington, Ks.

A MONSTER meeting was recently held at Tirnova to protest against the nnconstitutional acts of the Bulgarian government.

THE Italian military maneuvers were ahandoned hecause it was not thonght advisable to concentrate troops near the Austrian frontier.

WOODEN RAILWAY.—The *Engineering News* says that a wooden railway is in practical operation at Live Oak, in Florida. Pine or other logs are split in halves and laid on the road hed with the flat side up for a track. Dove-tail the ends together, make the top surface smooth, the sand will pack under the logs and hold them in place, lay the logs far enough apart for a mule to travel hetween, and the track is completed. The car is kept to the track hy making the wheels eighteen inches or two feet wide. It is found that eighteen inches width of wheel gives play enongh, so that it is impossible for the cars to leave the track.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Gila, Aug. 30th, $5,090; Northern Belle, Aug. 30th, $4,666.71; Martin White, Aug. 31st, $7,284.16; Bodie Con., Sept. 1st, $17,000; Christy, Sept. 2d, $6,193; Hillside, Sept. 2d, $4,200; Hillside, Aug. 28th, $4,200; Northern Belle, Aug. 25th, $2,978.96; Alexander, Aug. 28th, $8,133.64; Ophir, Aug. 27th, $24,394.12; Hillside, Aug. 30th, $4,100; Martin White, Aug. 27th, $5,357.15.

TENACITY OF PURPOSE.—The life of Louis Favre, the well-known Swiss engineer, and the constructor of the St. Gothard tunnel, furnishes an example of tenacity of purpose worthy of imitation. When he began the building of the tunnel, which he was not permitted to see completed, he was attacked in the wildest manner by engineers and mechanics, who accused him of being a dreamer and a man devoted to idle theories. He was a genius, however, and forced his way from a poor lad to a world-wide repute as a practical theorist. He died worth millions, which is not so much to the point of the moral involved in his life as his steady perseverance against obstacles to the carrying out of well-grounded theories.

LABOR.—The world owes most of its growth to men who tried to do as much work as they could. The debt is small to those men who worked as little as possible, and there will not be many credits to those who shirk. To most men more than eight hours work is necessary for the maintenance of physical, mental and moral health. The forces of the animal nature and passions can only be kept down by physical exertions. If mechanical improvements should discharge men from the necessity of laboring more than six hours a day, there is no doubt that society would rot in measureless and fatal animalism.

A Library for Inventors.

We have at our patent offices, No. 202 Sansome street corner Pine, a complete set of Patent Office reports, containing engravings and claims of EVERY PATENT ever issued in the United States.

We have also a complete set of the MONTHLY VOLUMES issued by the Department, with full detailed description and large drawings of all the patents issued since the time when these volumes were first published.

A set of all the LAW BOOKS ON PATENTS is also on our shelves ready for reference. We have also the British Commissioners reports, Canadian Patent Office reports for all British North America, full files of MINING AND SCIENTIFIC PRESS, PACIFIC RURAL PRESS, *Scientific American*, *Scientific American* supplement, *American Artisan* and other American and foreign scientific and mechanical journals, as well as mechanical dictionaries, chemistries, encyclopedias, and other works of reference.

Inventors and patentees are WELCOME TO EXAMINE at their leisure any of the books in the above sets, and we shall be glad to give them any assistance in hunting up what they want.

Our library is the most complete of its kind on the Pacific Coast in every respect, and we are continually adding to it as occasion demands. DEWEY & CO.,

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1870	21	1 Copy of No. 7, August 13th.
1871	22	5 Copies of No. 1, Jan. 7th.
1871	22	3 Copies of No. 5, Feb. 4th.
1871	22	1 Copy of No. 3, Jan. 21st, 6 of Feb. 2d, and 1 of May 1st.
1871	23	1 Copy of No. 2, July 15th, and 0 Sept. 2d.
1872	24	2 Copies of No. 4, Jan. 27th.
1872	24	3 Copies of No. 7, Feb. 17th.
1872	24	2 Copies of No. 17, April 27th.
1872	25	1 Copy of No. 10.
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1873	26	3 Copies of No. 8, Feb. 22d.
1873	26	3 Copies of No. 9, March 1st.
1873	26	2 Copies of No. 10, March 8th.
1873	20	1 Copy of No. 7, Feb. 15th.
1873	27	3 Copies of No. 20, Nov. 15th.
1873	27	4 Copies of No. 21, Nov. 22d.
1873	27	3 Copies of No. 24, Dec. 13th.
1875	30	1 Copy of No. 4, Jan. 23rd.
1875	30	1 Copy of No. 5, Jan. 30th.
1875	30	1 Copy of No. 8, Feb. 20th.

HELP IN ACQUIRING KNOWLEDGE.—In acquiring a knowledge of the English language, and especially in learning the meaning of words, probably no other work, nor many other books altogether, can afford so much aid as Webster's Unabridged Dictionary, with its 3,000 pictorial illustrations, its precise and full definitions, its careful discrimination of synonymous words, its many valuable tables, and above all with the recent additions to it of a supplement of over 4,600 new words and meanings, such as have come into the language within the last few years, and a new biographical table of more than 9,700 names of noted persons, giving in brief the name, pronunciation, nationality, profession and date of each. It is, in itself, a whole library of the language. Let one family have a copy of this work, and use it faithfully, and another be without it, the difference in the progress of the two families in getting knowledge will be very great.

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[WHOLESALE.]

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Crystal Wax	17 @—
Eagle	12 @—
Patent Sperm	30@—
CANNED GOODS.	
Assorted Pie Fruits, 2½ lb cans	2 25 @ —
Table do	3 50 @ —
Jams and Jellies	3 75 @ —
Pickles, hf gal	3 25 @ —
Sardines, qr box	1 67½@1 90
Hf Boxes	2 50 @2 75
Merry, Faull & Co.'s. Preserved Beef, 2 lb. doz	3 75 @4 00
do Beef, 4 lb. doz	6 50 @ —
Preserved Mutton, 2 lb. doz	3 75 @ —
Beef Tongue	6 50 @ —
Preserved Ham, 2 lb, doz	6 50 @ —
Deviled Ham, 1 lb, doz	5 50 @ —
do Ham, ½ lb doz	3 00 @ —
Boneless Pigs Feet, 3 lbs	4 50 @ —
2 lbs	3 75 @ —
Spiced Fillets, 2 lbs	4 25 @ —
Head Cheese, 3 lbs	4 25 @ —
COAL—Jobbing.	
Australian, ton	6 00 @ 6 50
Coos Bay	— @ 5 50
Bellingham Bay	— @—
Seattle	5 50 @ 6 00
Cumberland	12 00 @15 00
Mt Diablo	4 75 @ 6 00
Lehigh	11 50 @12 50
Liverpool	6 00 @ 6 50
West Hartley	— @ 8 00
Scotch	@ 8 00
Scranton	— @— —
Vancouver Id	6 00 @— —
Charcoal, sack	75 @— —
Coke, bush	60 @— —
COFFEE.	
Sandwich Id, lb	— @— —
Costa Rica	16 @ 16½
Guatemala	16 @ 16½
Java	25 @— 26
Manilla	17 @— —
Ground, in cs	25 @— —
FISH.	
Sac'to Dry Cod	— @ 4
do in cases	5 @ 6
Eastern Cod	— 7 @— 7½
Salmon, bbls	8 00 @ 9 00
Hf bbls	5 00 @ 5 50
1 lb cans	1 10 @ 1 12½
Pkld Cod, bbls	22 00 @— —
Hf bbls	11 00 @— —
Mackerel, No. 1, Hf Bbls	9 50 @10 00
In Kits	1 85 @ 2 10
Ex Mess	3 25 @— —
Pkld Herring, bx	3 00 @ 3 50
Boston Smkd H'g	70 @— —
LIME, Etc.	
Plaster, Golden Gate Mills	3 00 @ 3 25
Land Plaster, tn	10 00 @12 50
Lime, Sta Cruz, bbl	1 25 @ 1 50
Cement, Rosendale	2 00 @ 2 25
Portland	4 00 @ 4 50
NAILS.	
Assted sizes, keg	2 70 @ 2 75

OILS.	
Pacific Glue Co's Neatsfoot, No 1	1 00 @ 90
Castor, No 1	1 35 @ —
do, No. 2	1 30 @ —
Baker's A A	1 25 @1 30
Olive, Plagniol	5 25 @5 75
Possel	4 75 @5 25
Palm, lb	9 @ —
Linseed, Raw, bbl.	78 @ —
Boiled	80 @ —
Coconut	55 @ —
China nut, gal	— @ 65
Sperm	1 40 @ —
Coast Whales	— @ 32½
Polar	— @ 35
Lard	— @ 70
Oleophine	22 @ 22
Devoe's Brl't	17½@ 18½
Photolite	— @ —
Nonpariel	31 @ 32½
Eureka	18 @ 42½
Barrel kerosene	20 @ —
Downer Ker	35 @ —
Elaine	37½@ —
PAINTS.	
Pure White Lead	8 @ 8½
Whiting	1½@ —
Putty	4 @ 5
Chalk	1½@ —
Paris White	2½@ —
Ochre	3½@ —
Venetian Red	3½@ —
Averill Mixed Paint, gal White & tints	2 00 @2 40
Green, Blue & Ch Yellow	3 00 @3 50
Light Red	3 00 @3 50
Metallic Roof	1 30 @1 50
RICE.	
China, Mixed, lb	4½@ 5
Hawaiian	6 @ —
SALT.	
Cal. Bay, ton	15 00 @22 50
Common	10 00 @12 00
Carmen Id	12 00 @14 00
Liverpool fine	19 00 @— —
SOAP.	
Castile, lb	8 @ 15
Common brands	4½@ 6
Fancy brands	7 @ 8
SPICES.	
Cloves, lb	— @ 45
Cassia	19 @ 20
Nutmegs	85 @ 87½
Pepper Grain	— @ 12
Pimento	19 @ 20
Mustard, Cal., ½ lb glass	— @1 25
SUGAR, ETC.	
Cal. Cube, lb	— @ 10½
Powdered	10 @ 10½
Fine crushed	— @ 10½
Granulated	— @ 10
Golden O	— @ 8½
Cal. Syrup, kgs	70 @ —
Hawaiian Mol'sses	26 @ 30
TEA.	
Young Hyson, Moyune, etc	— @ 51
Country pckd Gunpowder & Imperial	— @ 42½
Hyson	30 @ 35
Foo-Chow O	35 @ —
Japan, 1st quality	40 @ —
2d quality	20 @ 2

METALS.

[WHOLESALE.

WEDNESDAY M., September 3, 1879.

IRON.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2½@ 3½
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 7
Norway, according to thickness	6½@ 7
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @
TIN PLATES.—	
10x14 I O Charcoal	8½@ 9
10x14 I C Coke	7 @ 7
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb. less than cask	9½@— 10
NAILS.—	
Assorted sizes	2 90@3 00

LEATHER.

[WHOLESALE.]

WEDNESDAY, M., September 3, 1879.

Sole Leather, heavy, lb	22 @ 29
Light	20 @ 24
Jodot, S Kil, doz	48 00 @50 00
11 to 13 Kil	65 00 @76 00
14 to 19 Kil	80 00 @90 00
Second Choice, 11 to 16 Kil	55 00 @70 00
Cornellian, 12 to 16 Kil	57 00 @67 00
Females, 12 to 13 Kil	63 00 @67 00
14 to 16 Kil	71 00 @76 00
Simon Ulmo, Females, 12 to 13 Kil	58 00 @62 50
14 to 15 Kil	66 00 @70 00
16 to 17 Kil	72 00 @74 00
Simon, 18 Kil	61 00 @63 00
20 Kil	65 00 @67 00
24 Kil	72 00 @74 00
Robert Calf, 7 and 9 Kil	35 00 @40 00
Kips, French, lb	1 00 @ 1 35
Cal. doz	40 00 @60 00
French Sheep, all colors	8 00 @15 00
Eastern Calf for Backs, lb	1 00 @ 1 25
Sheep Roans for Topping, all colors, doz	9 00 @13 00
For Linings	5 50 @10 50
al. Russet Sheep Linings	1 75 @ 4 50
oot L ess, French Calf, pair	4 00 @—
BGood French Calf	4 00 @ 4 75
Best Jodot Calf	5 00 @ 5 25
Leather, Harness, lb	15 @ 38
Fair Bridle, doz	48 10 @72 00
Skirting, lb	33 @ 37
Welt, doz	30 00 @50 00
Buff, ft	38 @ 21
Wax Side	07 @ 80

LUMBER.

WEDNESDAY M., September 3, 1879.

CARGO PRICES OF REDWOOD.		PUGET SOUND PINE RETAIL PRICE.	
Rough, M	13 00	Rough, M	18 00
Refuse	9 00	Fencing	18 00
Clear	23 00	Flooring and Step	28 00
Clear Refuse	13 00	Narrow	30 00
Rustic	23 50	2d quality	25 00
Refuse	18 00	Latha	3 50
Surfaced	20 00	Furring, lineal ft	
Refuse	14 00	**REDWOOD.** RETAIL PRICE.	
Flooring	20 00	Rough, M	18 00
Refuse	12 00	Refuse	14 00
Beaded Flooring	23 00	Pickets, Rough	15 00
Refuse	13 00	Pointed	16 00
Half-inch Siding	16 00	Fancy	22 50
Refuse	14 00	Siding	20 50
Half-inch Surfaced	20 00	Surfaced & Long Beaded	30 00
Refuse	14 00	Flooring	30 00
Half-inch Battens	16 00	Refuse	22 50
Pickets, Rough	11 00	Half-inch Surfaced	30 00
Rough, Pointed	12 50	Rustic, No. 1	30 00
Fancy, Pointed	18 00	Battens, lineal ft	
Shingles	1 75	Shingles M	2 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, September 3, 3 P. M.

SILVER 25.

GOLD BARS, 890@910. SILVER BARS, 6@16 ⅜ cent. discount.

EXCHANGE on New York, 20, on London bankers, 49½@49¾. Commercial, 50; Paris, five francs ⅜ dollar; Mexican dollars, 90½@92½.

LONDON Consols, 97⅞; Bonds (4%), 104¾.

QUICKSILVER in S. F., by the flask, ⅜ lb. 33½c.

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending September 2, 1870.

HIGHEST AND LOWEST BAROMETER.

Aug. 27	Aug. 28	Aug. 29	Aug. 30	Aug. 31	Sept. 1	Sept. 2
29.900	30.043	20.982	29.886	20.060	30.025	29.978
29.943	29.985	29.802	29.800	20.823	29.950	29.920

MAXIMUM AND MINIMUM THERMOMETER.

64	68	73	89	77	62	64
55	50	57	60	57	54	53

MEAN DAILY HUMIDITY.

77.3	69.3	62.3	48.3	74.7	81.7	82

PREVAILING WIND.

W	W	W	NE	W	W	W

WIND—MILES TRAVELED.

376	243	152	161	154	331	205

STATE OF WEATHER.

Clear.	Clear.	Clear.	Clear.	Clear.	Fair.	Fair.

RAINFALL IN TWENTY-FOUR HOURS.

Total rain during the season, from July 1, 1879. 0.03 in.

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Any stock upon which this assessment shall remain unpaid on the 29th day of September, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the 21st day of October, 1879, to pay the delinquent assessment, together with the cost of advertising and expenses of sale.

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CHAS. H. GOODWIN ..... Treasurer.
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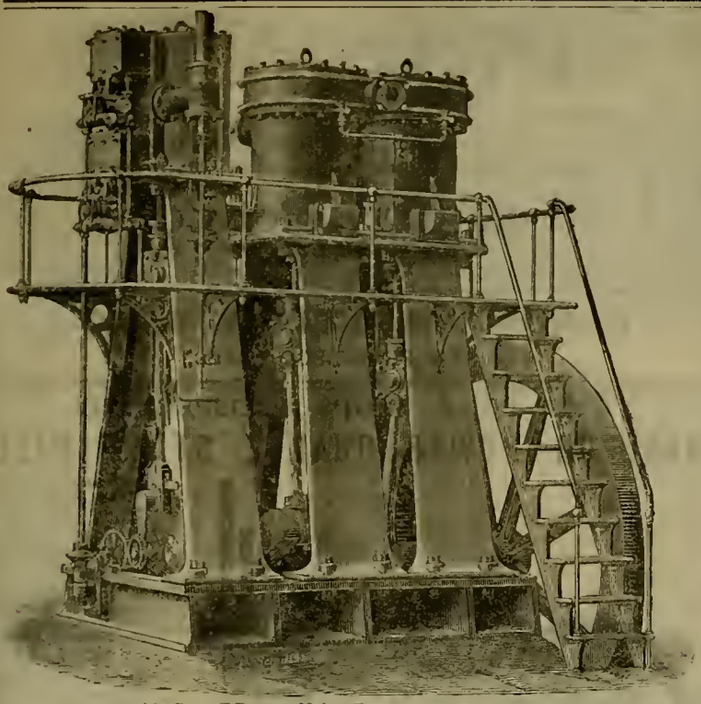

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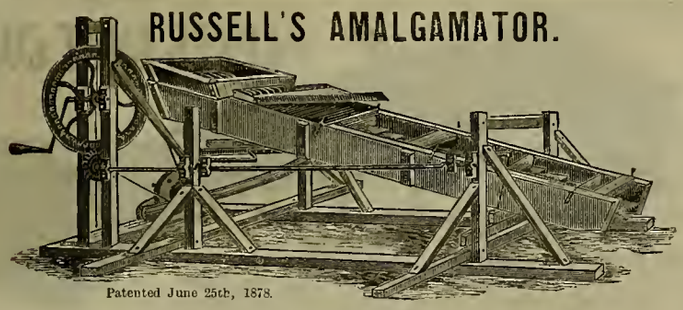

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HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

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No. 1 XX) is the Strongest Explosive Known.
No. 2 is superior to any powder of that grade.

PATENTED IN THE UNITED STATES PATENT OFFICE.

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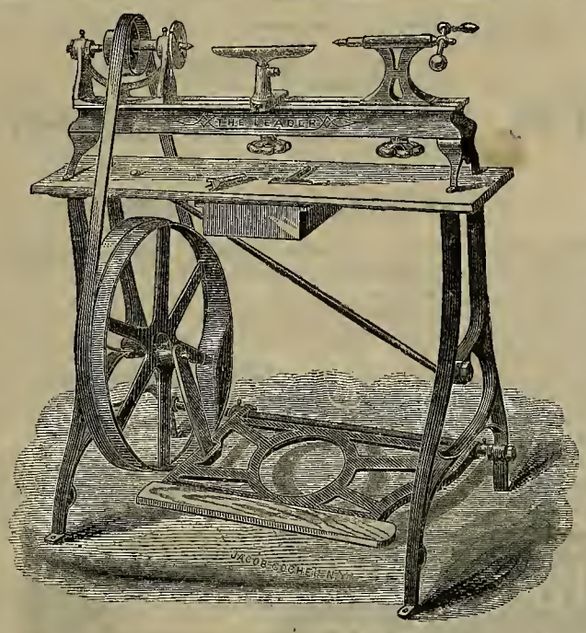
This lathe has been made especially to meet a want felt by many for a really good and substantially made Foot-Lathe at a reasonable price, and we think that we can safely say that it is by far the best Lathe ever placed on the market at the price asked. The bed, head, and tail stocks are of iron, the spindles of steel. The bearing of the head stock is conical, so that the wear can be easily taken up.



Material eighteen inches long and eight inches in diameter can be turned upon it. The pieces that accompany this Lathe without extra charge are two T rests, two plain centers, one spur center for wood turning, and one face plate.

Price of Lathe without Saw Attachments.....$45. Price of Lathe WITH SCROLL Saw Attachment.....$55.
Price of Lathe with both Scroll and Circular Saws, $70.

Trump Drill Chuck.

Chuck for drills ⅜ and under, Price.....$1.50
Chuck, for drills ¼ and under, Price.....$2.25
They are made on solid steel plug, centered and *readily fitted to Lathe or Drill Press.*
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MANUFACTURED UNDER A. NOBEL'S ORIGINAL AND ONLY VALID NITRO-GLYCERINE PATENTS

Nos. ONE, TWO and THREE.

Stronger, Better and Safer than any other High Explosive.

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It breaks more ground, pulverizes it better, saves time and money, and is superseding the ordinary powder wherever it is tried. Triple Force Caps and all Grades of Fuse.

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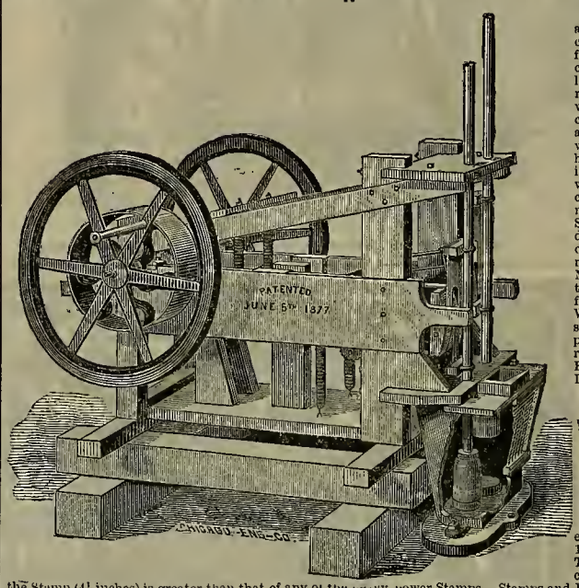
THE POOR MAN'S PROSPECTING HAND OR POWER QUARTZ STAMP MILL.



Two men can operate it all day. It is simple, efficient and durable. The force of the blow can be changed so as to strike a light or a very heavy blow readily. Two men can work this Mill to its full capacity, and do this work as well as can be done with any of the old-style heavy Stamp Mills. An inspection of this Machine will convince any practical person that it is the most perfect QUARTZ STAMP MILL ever produced in this or any other country. A large number of old practical Miners have seen it, and they all say it is a perfect Hand Stamp Mill. We put on a band pulley, so it can be run with power. This cut is a correct representation of C. EATON'S Patent LATELY PERFECTED MILL

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IT IS SIMPLY

Perfection!

When power is used each Stamp will strike 150 blows per minute. The force of the blow in comparison to the face of the Stamp (4½ inches) is greater than that of any of the heavy power Stamps. Stamps and Dies cast on Chill. These Machines are well and thoroughly made, nothing about them to get out of order. They are put together with bolts. Can be taken apart readily, so as to be convenient to pack on a mule's back. The whole machine weighs about 1,300 pounds. The heaviest piece weighs 200 lbs. These Mills will do more work (according to money invested) than any of the old heavy Stamp Mills. For sale at AMES' STEAM ENGINE DEPOT, 14 S. Canal street, Chicago, Illinois. Net Cash Price, $150.

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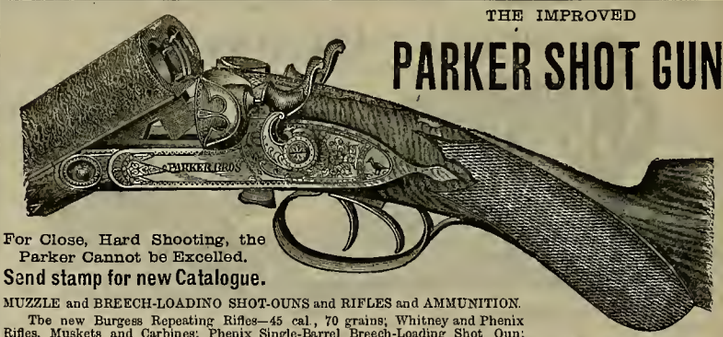

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MINERS TESTIFY THAT IT IS FREE FROM OBJECTIONABLE FUMES.

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No. 1.—Equalling Liquid Nitro-Glycerine in Strength. We recommend this Grade in extremely hard rock, boulders, iron, etc.
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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. | SAN FRANCISCO, SATURDAY, SEPTEMBER 13, 1879. | VOLUME XXXIX Number 11.

Twenty-Nine Years a State.

On the evening of September 9th last, the 29th anniversary of the admission of California to the Union, was celebrated with appropriate ceremonies by the Territorial Pioneers, at the B'nai B'rith hall, Eddy street, San Francisco.

There is very little in the mere announcement of this anniversary to distinguish it from any other anniversary, unless we recall to our mind's eye the progressive development of California from her admission to the Union to the present time; her condition and prospects then, and her prominent position in the world now. There are men now living, and they are comparatively young, who came to our shores when the whole of the Pacific slope was either so thinly settled as to be a comparative wilderness, or contained a different race of men than those who now throng its hills and valleys.

Long ago, before our rich mineral and agricultural resources were known to the world, a writer in drawing conclusions from the early history of mankind, predicted that the greatest civilizations and power of the vast territory of the United States would, in some future period, be found in the narrow strip of country west of the Rocky mountains. The prediction now seems like an inspired prophecy, and near its fulfillment.

In the year 1848 there was nothing in the "signs" which pointed to California either as an El Dorado, or as an empire within an empire. On the 19th of January, 1848, James W. Marshall, picked up in the race of a mill, on the banks of the American river, a piece of bright, yellow metal. He was ignorant of its nature. Mrs. Elizabeth Jane Wimmer, who lived in the vicinity, pronounced it gold, from her knowledge of that metal while living at the gold mines of Georgia. That was all. From this simple find was to arise the greatest civilization of the vast territory of the American continent. From all parts of the world came a vast motley crowd. Where were the mines of gold and silver of other parts of the world that up to this time had been so well and so favorably known? They were still yielding, as they are now, and as they will, perhaps, to the end of time, a meager supply of the world's medium of exchange. The world took cognizance of the magnitude of California as an El Dorado, as if it had received a revelation. The world's supply of gold and silver was inadequate to the needs of increasing commerce. Governments were endeavoring to solve the problem of how to increase the money supply, to prevent the lengthening of what was foreseen to become gigantic international commercial relations. Statesmen had in vain pondered over the matter and recommended measures, but in vain. The small, bright, yellow piece of metal found on the American river at Sutter's mill solved the problem; introduced a new philosophy; a new system of political economy among nations. From that time to this, only 30 years, hardly one generation, untold millions have been yielded up from the treasure stores of our State, and an empire has its foundation laid in the solid rock of prosperity. The grand achievements resulting from this shining yellow piece of metal are not confined to our own State. They spread over the whole word and have brought about a civilizing influence. A cosmopolitan, international spirit has pervaded the entire mass of humanity upon the earth, and the world has progressed. Would it have been as far advanced if California were still unknown? We are bold enough to utter an emphatic denial. Our wealth is yet untold. The surface of the ground has alone been imperfectly touched by the pick of the miner. The refuse of early days is now yielding wealth to more careful hands. Our veins of gold and silver are exhaustless, for nature is not eccentric in the deposit of her riches. She has placed her most precious minerals within our borders, and to find one line of mineral is to find promise of another. Gold and silver mining is as old as the first gathering of the human race into nations. No history refers to an epoch anterior to the use or search of the precious metals. Their discovery, obtainment and use, have exerted a refining influence, and those nations engaged in their production and circulation were proportionately progressive in wealth, power and arts. Where are the signs of decay in our mines? Only 30 years in all and but few of those 30 years spent upon veins, nearly all upon placer mining. Centuries have not exhausted known and well-defined metalliferous veins, they are productive as long as power can be provided for their working. Such has been the experience in Europe, and greater than that will be the experience of California, inasmuch as her golden veins are richer and more numerous. The scepter of power and civilization has been within our grasp but a short time only, for our State is but an infant in age, though of strong promise, but a future generation looking down from its advanced position, will still feel all the wonder at 60 years of growth, as we now feel at only 30. Our mines are waiting the fruition of the prophecy alluded to in the beginning.

New Zealand Gold Fields.

It appears from the last number of the *Thames Advertiser*, that the output of the gold mines of New Zealand from the 21st of July to the 15th of August was about 2,000 tons of ore, which yielded under the stamps 2,697 ounces, and 8 dwts. of gold, equivalent to an average of about 1½ ounces per ton. This yield is regarded as very satisfactory. The Borough Council has consented to contribute 250 per month out of the gold duty toward paying the big pump. The County Council declined to consider an application for a like amount. The pump, however, is again in operation, and had, during the week previous to Aug. 15th, reduced the water in the mines 40 feet.

To save expenses the engineers stoke for themselves, and keep only a pitman and a lad to wheel coals and run messages. Six of the miners have quartz lying stacked outside the drive, which they are unable to have hauled to the crushing mills on account of impassible roads. The accumulation of quartz has been so great that it interferes with the output, which is consequently less than it would be if facilities for removing it existed.

In the Moanataiari mine a large quantity of paying stone is being taken out. The ledge at the 150 level is 18 inches thick, and of promising appearance. The rock drill is working satisfactorily, being more expeditious and cheaper than by hand. There are fine gold-bearing stringers in the face of the drive.

In the Tairua district considerable prospecting is going on, and in one claim there have been found two crevices of quartz, about a foot thick. Gold has shown itself all the way down to 60 feet, the depth sunk, but the richer stuff was obtained nearer the surface. A parcel of about 30 tons, recently taken from it, gave a return of 45 ounces of gold.

The drainage question is regarded as very important in the mining region, and the Drainage Association have secured the co-operation of all the mines in their efforts to keep them free of water. The most auriferous portions of the mines are under water and cannot be worked. New machinery, including a turbine, are being put in, however, which it is hoped will accomplish the object of their desires.

THE new Cassiar Mining district of British Columbia has been abandoned, the claims being worked out.

City Foundry Notes.

Fulton Iron Works.

The Fulton Iron Works (Hinckley, Spiers & Hayes) is one of the only two large foundries which are at present doing very much work in in this city, business in this line being very slack as a general thing. Among other work under way at the Fulton is a 30-stamp mill for the Noonday mine at Bodie. This order also includes 24 five a half-foot pans, 12 eight-foot settlers, a 23x48-inch engine, and three steel boilers, 54x16 inches, the whole forming a complete outfit for the mine. They are also building a 20-stamp mill for the Western Mining Company, Tombstone district, Arizona, together with 14 five-foot pans, 7 eight-foot settlers, an 18x14 engine, and two steel (54x16) boilers. This order includes all the necessary shafting, pulleys, retorts, etc., etc., for the mill.

Among other work just completed is a 10-stamp mill for the Paradise mine, Nevada, with a 16x36 engine, four pans, two settlers, and a 55x16 boiler. Another 10-stamp mill has been shipped to the Monumental Mining Company, Oregon. The whole mill was complete, and included four pans, two settlers, a 14x30-inch engine, two 42x16 boilers, etc. They are also building a hoisting engine for the McMillan mine, Globe district, Arizona, with engines, boiler, etc., complete. Are building a 16-inch pump, 10 feet stroke for the Enterprise mine, Plumas county, Cal. They are doing the usual amount of small work, some steamboat repairing, etc. The Fulton has been pretty busy all summer, and is now working full handed with 170 men.

The Risdon Iron Works.

The Risdon Iron Works are at present making a number of mining hoisting engines of the compound type, a form which meets with much favor. They are made with 9 and 18-inch cylinders, and are compact and in one piece. They work from 1,200 to 1,800 feet with great success. Mr. Moore, the superintendent, informs us that in Europe they are now compounding all the locomotives, as they did many steamers here when this form of engine came more into favor. We are not advised as to details of the method of compounding the locomotives, but it has evidently been successfully accomplished.

FOREIGN MINERS NOT WANTED.—A correspondent of the New York *Sun*, under the above caption, regards the agitation in favor of the immigration of English miners to the coal fields of Pennsylvania as nothing less than criminal, because there is no demand for miners and laborers in the anthracite region of Pennsylvania. The present force of miners and laborers number about 70,000 men and boys, and they can mine the regulation 22,000,000 tons per year by working only three days a week. We do not apprehend that all foreign emigration of miners is directed to the coal-fields of Pennsylvania, nor are the jealousies and disturbances in that region destined to rend the country asunder. We happen to have rich mines on this coast, and welcome intelligent labor with capital. The continuation in the East of a close corporation spirit will perpetuate the Pacific slope.

A Ten-Foot Extension Rule.

William J. Derickson, of Clayton, Contra Costa county, has recently patented, through the MINING AND SCIENTIFIC PRESS Patent Agency, a very convenient tool for carpenters, bridge builders, and all mechanics who use a ten-foot pole. It is simply a ten-foot extension rule, properly graduated, and made in four pieces.

Figure 1 shows the first two parts of the rule, connected by the slides, *E* and *F*, which allow of the parts sliding by each other. When a desired measurement is reached the parts are secured by means of a set screw, on the slide, *E*, when the measurement may be read on the face of the slide, *E*. Some of the rules are made with a cam, instead of a set screw, an arrangement somewhat more convenient, as more quickly connecting or disconnecting the parts.

Figure 2 shows the ends and connections of the ten-foot extension. The left shows the joint, connected and held in place by means of the spring, *m*, entering the slot, *n*, from the inside, which is relieved by pressure when the joint is withdrawn. The right shows the joint withdrawn.

Outside measurement may be taken by means of the callipers, *J J*, Fig. 2; and there are similar callipers in the five feet extensions. The calliper measurements are read on the narrow edges of the rule, and indicated by the point on the sides of the slide, *E*, Fig. 1, which accounts for the space taken up by the callipers. Figure 3 shows the compact form of the rule when placed in a chest, 1 feet 8 inches by 1¾ by 1½ inches.

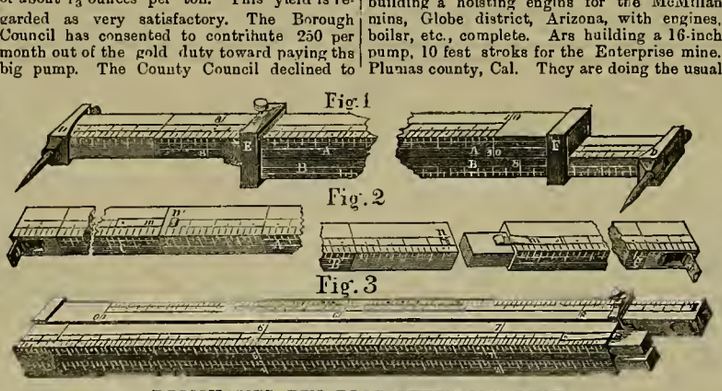
This rule will describe circles or curves of any desired radius of 10 feet or less, by the use of the trammels, *D D*, Fig. 1. A common pencil may be screwed in the place of either point, if desired. The points being parallel with the clamps, they may be placed flush at the ends, using the extension to measure; or, they may be used on one of the pieces, by moving one of the clamps to the measurement desired.

The callipers, on plates *J J*, are provided with springs on their spindles, so they will be kept down flush when closed, and may be raised by the thumb in taking outside measurements.

To measure circles, or arcs of circles, the trammel clamps are put in place on the ends. The parts are adjusted by each other until the proper size is reached, when one point is placed down, and the other describes the arc or circle of the required size. The trammels may be put on the ends of the short pieces, *A A*, or may be slid up or down either of the parts to suit requirements.

The ordinary ten-foot rules used by carpenters, bricklayers, and other workmen, are very troublesome from their inconvenient size. New ones have to be made very frequently, and the fractions of feet have to be measured with the two-foot rule, they not being marked on the poles. Two rules have, therefore, to be used to get one measurement.

Then again, two pieces are lapped upon each other and nailed together, and then measured, for taking inside measurements. Mr. Derickson's device overcomes these obstacles by making the rule in the four parts which slide by each other as described; and whenever a measurement is taken, either inside or outside, the dimensions are marked on the scale accurately in feet, inches and fractions of inches, as shown. The whole rule may, when closed, be placed in the chest with the ordinary tools. The rule is now on exhibition in the Mechanics' fair, division W, on the partition of the stairs leading to the gallery from the Market-street end of the machinery department.



DERICKSON'S TEN FOOT EXTENSION RULE.

BODIE BULLION YIELD.—The bullion yield of Bodie district for the month of August amounted to $213,518 15. Of this amount the Standard shipped $138,039.68; Bodie, $69,567.40; Noonday, $5,911.07. For the months from January to August inclusive the production of this camp foots up a grand total of $1,563,066.85. For the same period of 1878 the shipments amounted to $1,308,959.68. It will be seen that the output of bullion so far this year has been greatly increased over that of 1878. The increase amounts to $251,107.17. The Standard has shipped two bars this month, amounting to $35,181.17.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents. —EDS

Poisoned Water.

EDITORS PRESS:—Much has been said and written in regard to the poisoning of water by the use of lead pipe. It is now asserted in some quarters that galvanized iron pipe, now extensively used in place of lead, is equally poisonous, or more so; also that the brass (or other composition) rods used in force pumps are open to the same objection.

It is also asserted, by physicians and others, that the water from the elevated tanks in common use throughout the country is poisonous and unfit for drinking. As these are matters of great importance, not only to individuals and families, but to the whole community, please enlighten us in regard thereto, chemically or otherwise; and also state in what the process of galvanizing iron consists, and what is the best pipe for the conduct of drinking water.—PURE WATER.

EDITORS PRESS:—It would be easy to write a volume in giving a full reply to the above inquiry, the subject being one whose importance is only equaled by the difficulty of giving rules applicable to all cases, and avoiding the jumping to hasty conclusions.

First, as regards the use of zinc, whether in independent sheets or covering the surface of sheet-iron ("galvanized"), I have for many years past warned and protested against the tendency to its use in place of tinued iron (tin-sheet) for almost all purposes. We have seen "galvanized" tanks and evaporators for acid juices; ditto preserve kettles, milk-pans, and finally, even churn-dashers, warmly recommended as cheap and innocent substitutes for tinned sheet, copper and brass, as well as for iron, and even wood. I claim some merit in disposing of the zinc churn-dasher, by publishing an analysis of some of the resulting buttermilk, which was thick with the zinc compounds formed in its corrosion by the sour cream; but then, it made the butter (and such butter!) come in the twinkling of an eye. However, I still see the "galvanized" preserve-kettles and cooking-pots for sale in the shop windows, and often feel curious how the consumers of their contents stand it.

It is not altogether easy to explain to the unprofessional reader just when and where zinc, or zinc-covered iron, must not be used in connection with substances designed for eating and drinking. As for copper and brass, they may be considered unobjectionable for water pumps and for vessels used in ordinary culinary operations, provided the latter are kept perfectly bright and acid or salty messes are not allowed stand (or in the case of fruit even to cool) in them, especially when exposed to the air. It is at the edge of the fluid, where it meets both the metal and the air at the same time, that corrosion of these metals occurs; hence there is little danger in boilers kept close, and none at all in the case of copper bottoms to kettles, etc., unless they are allowed to stand dirty when empty; when they must be scoured bright before using again. The fact, however, that the safety of the family depends so much on the cook's cleanliness, has caused copper kitchen pots to be largely discarded in favor of tinned sheet iron; both because tin "rusts" but very slowly, and when it does so the product is hardly to be classed as a poison. Yet when acid fruits, for instance, stand in open tin vessels for a length of time, tin will be dissolved and manifests itself in a change of color, progressing from the margin inward.

It is quite otherwise with zinc surfaces. Zinc dissolves readily in any acid, or even saline liquid, in the absence as well as in presence of air; and boiling, which in the case of copper diminishes the action, on the contrary greatly accelerates the solution of zinc. Any one making currant jelly in a zinc or "galvanized" preserve-kettle, must have noticed the froth that quickly gathers around the edges, and continues to rise while the juice is in the vessel, accompanied by a peculiar odor like that of impure hydrogen gas. Of course the operation leaves the kettle beautifully bright, for the dissolution of the metal goes on steadily so long as it lasts. As all fruits, vegetables, meats, etc., are more or less acid, and as salt water exerts a similar action, it is clear that the use of "galvanized" cooking utensils involves a steady consumption of zinc on the part of the family.

It has been contended by some that zinc is so bland and genial a metal, that the small amount thus conveyed into humanity may be viewed in the light of the administration of a gentle tonic like iron. Homœopathic believers would, however, consider it a pretty heavy dose; and few but interested persons will recommend to the general public the habitual administration of even small doses of any medicine whatsoever. The alleged blandness, however, is but illy illustrated in the most common compound—white vitriol or zinc sulphate—which not unfrequently gives rise to severe cases of poisoning, being easily mistaken for epsom salt. When it is considered that the habitual taking of such small doses of even the latter as are contained in the water of some regions, is sufficient to affect the health of the population most seriously, we must conclude that the use of zinc or "galvanized" vessels for kitchen, dairy or any similar purposes, involving the use of acid or saline fluids, is absolutely and unqualifiedly unsafe, and the lead frequently contained in it renders it doubly so.

The fact that some of its compounds are given medicinally in doses as large as those of iron compounds, lacks cogency in that the soluble iron salts (for example, copperas) have such an intensely disagreeable taste that no one will consume them unperceived. As is well known to housekeepers who have tried to stew or preserve fruit, etc., in iron vessels, and have seen the mess assume the color and taste of ink, no such safeguard exists in the case of zinc salts; the metal is more readily corroded than iron, and large quantities may pass unperceived into the system.

The case is not so clear, however, in regard to cold water pipes and tanks. The action of *pure* water on zinc surfaces is very slight, even in the presence of air; but the ordinary drinking waters are far from pure, and, at the same time, the *kind* of impurities they contain is exceedingly various, and these are very diverse in their action upon zinc. I think it may be said in general that *good drinking water*, especially that from streams, may, without danger to health, be passed through "galvanized" service pipes. Unfortunately, a good deal of the water actually used would not come under the above head; and, such as is naturally objectionable, whether on account of the presence of decaying substances or of mineral salts, is precisely that which also exerts a strong influence on the zinc surfaces of pipes and tanks.

The use of bare zinc surfaces in *tanks* is much more objectionable than in pipes, because of the free access of air and of the decaying matter that will accumulate and ferment there. Some waters will eat through an ordinary zinc sheet near the water surface of a tank in the course of a year; and the zinc so removed will, of course, have been swallowed by the consumers. There can scarcely be an excuse for not disposing of all trouble, expense and danger in this case, by giving the tank a good inside coat of asphaltum, paint or varnish, in every case. It is proper to say, that, from experiments made with sea water, it appears that "galvanized" sheet is much less acted upon by saline liquids than simple sheet zinc.

As for the water in the common elevated wooden tanks of the country, it is hard to say anything that would be absolutely true of all. The larger the tank, or rather the more slowly the water passes through it, the more liable it is to become foul; and, in general, all water from large tanks ought to be filtered through a charcoal filter before using it for *drinking*. This simple process disposes not only of all decaying matter, but also, in a great measure, of whatever metallic impurities may have been introduced by the pipes or pumps. Such filters are so simple and cheap, and so readily kept in order, that wherever there is any possible danger of water contamination, they ought to be used continually; as is actually done in many parts of the United States. And most users will be both surprised and edified when, at the semi-annual or annual cleaning out of the filter, they contemplate the array of filth, including bugs, maggots and nastiness of all kinds, from the virtual consumption of which this simple device has preserved them.

E. W. HILGARD.

University of California, Sept. 2d, 1879.

Utah.—Little Cottonwood.

EDITORS PRESS:—I have just had my attention called to an interview of the editor of the Salt Lake *Tribune* with Prof. J. S. Newberry, of Columbia College, on the subject of the prospects of different mining districts in this State.

Concerning this Little Cottonwood district he is reported to have used the following language:

"Little Cottonwood, which includes the famous Emma, Flagstaff and other noted mines was the next district visited by me. The nature of the mineral deposits here is totally different from those in Parley's Park. In the Park they are true fissure veins which carry comparatively little galena, and the ore is to be treated by milling rather than by smelting. In the Cottonwood, on the contrary, the ore occurs in chambers in limestone, was originally mainly galena, but is now changed to carbonate of lead. The nature of these mineral deposits is similar in all respects to those of Eureka, Nevada. The chambers and galleries have been dissolved out of the limestone by surface water carrying carbonic acid, and have been in subsequent upheavals opened by fissures, through which mineral solutions have flowed, more or less perfectly filling these cavities with ore deposits from such solutions. Very naturally these deposits lack the regularity and reliability of fissure veins, and they have in many cases, as the Emma, been completely worked out, so far as known; and yet the magnitude of some of these ore bodies, and the millions of dollars of bullion taken from them, prove that this class of deposits may be a source of great wealth. The great ore chambers formerly discovered here have been for the most part emptied of their contents. It is by no means certain, however, nor even probable, that all the valuable ore deposits are yet known, and there is encouragement for much and long-continued exploration in the extensive belt of country which is known to be metalliferous."

I am astonished that the distinguished Professor should have dealt so cavalierly and cursorily with such great interests as these of a district embracing about 20 paying mines, besides scores of others, some of them in as true fissure veins, and as distinctly not in limestone formations as any that can be found elsewhere. I am informed that the Professor came to Alta in the 11:30 morning train, dined at the inn, and then went up to the Emma mine and remained there till the train left, at three o'clock the same day!

The Emma mine is in the heart of the Limestone belt, which has made this region famous for its great "chambers of ore." What he says on the subject of limestone formation may be weighed for its full value. But the statement, or inference, that there are no true fissure veins here is singularly incorrect. There are mines, paying mines, in true *quartzite* fissures with no limestone rock above them, or on either side of them, or beneath them as far as known, which are worked 500 feet down and nearly 1,000 feet in drift on the veins without a break in their continuity or general uniformity of direction, and growing richer as they go down. They are not the mines that startle the world with their sudden production. They are scarcely known abroad. They are not Ontario's that show that "nothing succeeds like success." But they are fissure veins bearing ore in the great quartzite and iron and granite mountains that may be seen on every side from where the Professor dined, and ought to have attracted the attention of a distinguished scientist even in a three-hours' visit to a mining camp. All these different formations are quite as conspicuous as the lower lime-capped hills near the Emma, and all of them are dotted with claims in true fissure veins *not in limestone*. There is great reason to believe that some of these fissure veins traverse the district below the limestone, and that with depth even some of the limestone-chamber mines may strike permanent fissure veins that have contributed to their richness. However that may be, if Prof. Newberry will revisit Little Cottonwood he can be shown plenty of true fissure veins that promise permanence of production of paying silver ore, with some promise of gold also.

This Little Cottonwood district has suffered immensely by the opprobrium attached to the management of certain of its great mines. Smaller mines that in other districts would invite capital to take hold of them, and where at moderate prices such capital could develp them thoroughly, so as to bring out generous returns, are here "unsight, unseen," by reason of the repressive influence of former unsuccesses of the stockholders in the collapsed bonanzas.

We naturally expect scientific men to examine such matters more calmly and dispassionately than other men; to take ample time for investigation of important matters, and not to pronounce hasty opinions on the mining geology of a great mountain district, on the strength of one little stroll after dinner to a single mine.

A scientific man owes it to his position not to fan the flames of speculation towards those districts where excitement already runs wild, as it did in this district in 1872, and now does in Leadville, Park City, and Bingham; but rather to hold the even balance of his judgment, to foster investment where property has less fictitious, in proportion to its real, business value.

Alta City, Aug. 18th, 1879. F. J. SCOTT.

American and European Archæology.

A marked difference is observable between Europe and America with respect to the order of succession of the different prehistoric human "periods" to one another. In fact the succession is in the one exactly the reverse of what it is in the other. This difference is clearly expressed by the Rev. Stephen D. Peet in an article on "The Archæology of Europe and America." "In Europe," he says, "the cave-hunter, who used bone implements, first departed; the fisherman of the kitchen-midden next passed away; the builder of the earth mounds followed with his rude weapons, and the inhabitants of the palafitte next disappeared; and last of all the etruscan, the builder of the rude stone monuments. Thus Esquimaux, Basque Briton, Belgian, Celt, Saxon and Etruscan (?), are the successors to one another, while on this continent Quiches, Toltec, Aztec, Mound-builders, Red Indians, and Esquimaux are the silent throng who have reversed the column of departure. The Esquimaux was ruder than the Basque, and the Basque than the Briton, and so the order of departure gave place to a higher culture. In America the most civilized was the soonest removed, and the rudest remained the longest. The ancient city was deserted, but the pueblo remained; the pueblo itself changed inhabitants, but the Mound-builder remained; the Mound-builder was driven away, but the Red Indian continued; the Red Indian has disappeared, but the Esquimaux abides. The palaces of Palenque and Uxmal and the seven cities of Cibola are monuments of a civilization more ancient than the Mound-builders. The mounds of the Mississippi valley were doubtless erected by a more ancient race than the people who occupied at the time of their discovery. The Red Indians held an unbounded dominion more ancient than the villages which they inhabited, and the Esquimaux may possibly have once covered the whole land where all of these tribes so lately roamed, but the last survivor of all is now the rudest and wildest."—*Science Monthly.*

COPPER IN MAINE.—A copper belt some two miles long and from 200 to 400 feet wide, has been discovered about the middle of the southern part of Maine, directly on the coast. Some 20 miles to the northward of the copper belt, silver has been found in flakes, masses and filaments. A shaft has been sunk some hundred feet deep, and it is reported that the ore increases in richness with the depth.

Nova Scotia Mining Region.

A writer in the *Mining Record*, speaking of the mining affairs in Nova Scotia, says: "The whole Atlantic coast section of the peninsula of Nova Scotia proper, is believed to be of lower silurian age. This geological district is, at the western extremity of the Province, about 40 miles in width, but narrows gradually, although irregularly, as we proceed eastwardly, until, at Cape Corso, it runs out to a mere point. The total area of this district may be roughly estimated at nearly two-fifths of the whole area of the Province. Northward of this district and extending throughout the greatest length of the peninsula, with a generally easterly and westerly direction, are certain ridges usually classed as upper silurian and devonian; similar ridges, and also isolated masses of the same formation, form a large portion of the island of Cape Breton. These ridges and masses comprise the highest lands in the Province. Bounded by them on the south and elsewhere intersected or broken by them, we next find the carboniferous formation, which comprises all the remainder of the Province except a narrow band of new red sandstone, with associated trap, which forms the southern shore of Bay Fundy, and extends around the basin of Minas. The carboniferous district comprises a larger proportion of the total area of Nova Scotia than any of the others named.

"Gold is found throughout the widest extent of the lower silurian district, and in quartz beds—although usually called 'veins'—interstratified and conformable with the enclosing strata of quartzite and slate. Sometimes, although rarely, gold is found in true fissure veins of quartz. Indeed, such veins are rather of unfrequent occurrence. Where they are found connecting with, or intersecting, an ordinary quartz bed, it is usual—although not invariably the case—to find the quartz in the immediate vicinity of the point of connection, exceptionally rich in gold. These quartz beds, or auriferous lodes—locally called 'leads'—have a general easterly and westerly strike, conforming to that of the enclosing quartzite strata, and describing an approximate parallelism with the line of the Atlantic coast. The whole of the strata of this silurian district have been folded into numerous plaits, the axes of the plications of which also have a general parallelism with the neighboring coast line, consequently the quartz lodes, whilst they have all a nearly east and west strike, vary in dip from vertical to nearly horizontal; and so numerous are the folds already mentioned, that these extreme variations in dip sometimes occur within a few hundred feet of each other. As to the degree in which gold is distributed throughout this whole auriferous area, but little is yet known. The few 'gold districts' locally defined as such by the Provincial government, comprise in the aggregate only a small portion of the whole auriferous area, and even in the case of each of these 'proclaimed gold districts,' only a very small portion of the ground has yet been prospected. It may be remarked that, taking the city of Halifax as upon the meridian of the center of the whole gold-bearing tract, which it pretty nearly is, a large number of districts which have been proclaimed as such by law, and in which the principal mining operations have thus far been carried on, lie more to the eastward of that line than to the westward of it. It so happens that, in the western section of the Province explorations have never been prosecuted with much vigor. Yet it is certain that good prospects have been discovered in that section at numerous points extending to the extreme western shore of the Province."

GOLD DEPOSITS OF SACRAMENTO VALLEY.—While there seems to be no controversy as to the conclusion that the Sacramento and San Joaquin valleys occupy the bed of a former inland sea, situated between the Coast range and the Sierra Nevada mountains, which was filled by lava and debris from the adjacent mountains, it was considered doubtful whether the strata underlying these valleys contained any considerable deposits of gold or silver, because the mineral deposits were supposed to have been formed at a more recent period. Miners generally have believed that the ore veins were filled through crevasses either from melted quartz or liquid solutions containing minerals deep in the earth. The Folsom *Telegraph* says: "The recent developments through the enterprise of Mr. Wm. H. Dolman has established the fact that most if not all the gold and silver on the Pacific coast has been deposited from waters containing those metals in solution, as the lower strata of sand and gravel for a depth of 40 feet or more, is found to contain the crystallized sulphurets of those metals in abundance, and that they were formed where found is evident, from the fact that they not only adhere to the surface of smooth-worn pebbles, but fill the pores of the lignite or petrified wood found in those strata. That the evaporation from an inland sea in a climate like this, where scarcely a cloud is seen for six months in the year, would cause such a concentration as to produce such deposits, seems quite natural."

IMMIGRATION TO U. S.—A conference of delegates, representing 200,000 miners, was held in Manchester, England, on August 13th. A resolution was unanimously passed favoring emigration to the United States. If they all come, several of our undeveloped Western mines can be made to increase the wealth of the country.

MECHANICAL PROGRESS.

Water-Power Engines with Variable Stroke.

A Scotch engineer, Mr. John Hustie, says that about 13 years ago his attention was called to the necessity for some form of hydraulic power being substituted for horses in hoisting at the various sugar stores in Greenock; and he then designed a hydraulic winch mounted on wheels, and arranged to be connected by flexible tubing with the nearest water-main, so that one winch would be sufficient for several stores. In making the necessary calculations connected with this design he was surprised to find that the consumption of water was the same, whether a light or heavy weight was being raised; in fact, that as much water would be used in lifting the chain alone as was required for the greatest weight to be lifted. While thinking over this matter it occurred to him that if the stroke of the piston could be varied by some simple mechanical means, the difficulty would be overcome; but no encouragement was given to the employment of hydraulic power at the time, and the matter was laid aside until about three years ago, when the Greenock local authorities obtained an act of Parliament giving power to abolish the hoisting in the street by horses. As the employment of some form of hydraulic hoist thus became almost a necessity, his attention was again given to the principle, not only with a view to hoists, but for general purposes.

His first efforts were directed to obtaining a variable stroke of piston in a water engine. This was achieved in two ways; first, by means of a variable crank-pin, and secondly by employing a link as in the expansion gear of a steam engine. Both of these arrangements fulfilled the conditions required, but the variable pin was selected, as capable of being applied in a more compact form than the link. The principle was developed in three forms: (1) an arrangement with a screw, similar to the crank-pin of a slotting machine, which enables the engine to be set before starting so as to use a given quantity of water for any given amount of work; (2) an arrangement for varying the radius of the pin by hand while the engine was at work, which was a much more rapid way of effecting the change in the stroke than the former; (3) an arrangement for making the variation of the stroke automatic, the amount of work to be done by the engine being itself the means employed for effecting the change. This was by far the best method of the three. Engines on all these three principles have been constructed; 18 engines in all are now at work, and others are in course of construction. But the third or automatic method of varying the stroke is the most perfect form of this invention, and fulfills all the conditions necessary for the economical working of hydraulic motors with variable loads.

The consumption of water varies in proportion to the power required.

A New Nut Machine.—A new machine for sawing iron nuts has been invented in Springfield, Mass. The nut on which this machine is designed to work is of ordinary iron, but with two slots cut at right angles across the upper surface half as deep as the nut, so that when it is turned tight upon the nut the grip of the wrench closes up the apertures so much that it is impossible for the nut to work loose. The new machine will cut the slots in the red-hot iron as fast as it can be fed. The nuts are placed upon an iron plate in front of the operator, who with one hand pushes them forward till they drop one by one into an open box fitted to them, in which they are moved by gauge against a circular saw. A motion of the hand then turns each a quarter of the way round, when it is pushed against a second saw for the other slit. Thus, after the first one is cut into in one direction, two are slotted in the opposite direction by the same forward pressure against the saws. The saws, of soft steel, revolve 3,000 times a minute, the periphery traveling nearly four miles per minute, and the iron is sawed into as easily as a piece of wood on an ordinary machine. The machine will easily slot a ton of nuts, averaging 4,000 in number, in a day, and can probably be run up to a ton and a half.

Pressure Reducer.—In order to relieve low-lying and branch mains, and domestic service pipes from excessive or unnecessary pressure, and thereby reducing the liability to bursts in the former case, and of injury to house fittings in the latter, a reducer has lately been invented in Glasgow, the action of which is as follows: The valve is perfectly balanced, so far as the inlet pressure is concerned; hence, if there be no pressure in the outlet main, it falls from its seat by its own weight and allows the water to pass; but when the pressure on the outlet main becomes sufficient to lift the valve, it forces it back to its seat, where it will remain until the pressure in the outlet is again reduced. All, therefore, that is necessary in order to obtain a fixed limit of pressure in the delivery pipe is to weight the valve, either by dead weight or spring and lever, to such an extent as to balance the intended pressure when acting on the valve. When this has been done, the pressure in the inlet may vary to any extent, but that in the outlet can never rise above the fixed limit.

Tubular Piles.—The *Scientific American* describes a novel and ingenious system of constructing and driving piles which has of late been introduced into practice by Messrs. Le Grand & Sutcliff, of London, artesian well engineers. It involves a considerable departure from ordinary practice, inasmuch as the piles are driven internally and at the bottom, instead of externally and at the top. The invention originated with the senior member of the firm, whilst the credit of some of the applications of the principle is due to the junior member. The piles, says *Engineering*, are tubular, and can be made of either wrought or cast-iron, and the thickness of the metal can be proportioned to suit the varying circumstances of construction. The lower end of the pile is made solid and pointed, and is generally of wrought-iron and steel-tipped. The piles are made in sections, which are screwed together by strong steel sockets or joint covers, which are barrel-shaped on the outside in order to diminish friction when being driven. The method of driving these piles is as simple as it is novel. Instead of the blows being delivered on the head of the pile, the driving force is expended just where it is wanted, namely, at the point. This result is attained by using an elongated cylindrical driving weight, which travels easily inside the tube. The weight is raised by means of rope or rods, and is allowed to fall on the flat head of the solid point, the pile thus forming its own guide for the driving weight. The effect of each blow is to drag rather than to drive the pile down. The point is swelled, and of sufficient diameter to effect a clearance for the joint covers, which have to follow it down. This pile fractures and passes through minor obstructions. The system commends itself for its simplicity.

A Valuable Invention for the Laundry. A man in Bridgeport, Conn., has invented a very simple but ingenious machine for ironing shirts. It consists of an iron framework about five feet long, three feet wide and two and one-half high. On the top of the framework is attached the iron, which is a hollow cylinder or roller, 16 inches long and 18 inches in diameter. This is provided with arms at each end, and, being attached to a crank, when in motion it rides back and forth on the framework. The cylinder is heated by gas. An attachment called the bosom board is connected at the end of the frame by hinges. The operator stands at the end of the frame and operates the machine very simply. The shirt is placed over the board the same as when ironed by hand, being drawn tight and smooth. The board is then thrown down in its place with the bosom upward. The heated cylinder passes over and finishes the work. This machine is capable of ironing from 500 to 600 shirts a day.

Scraping Hogs by Machinery.—Man's inventive genius descends on many occasions to a porcine level. This remark is called forth by an invention used in Chicago in the packing houses of Armour & Co. for scraping hogs. As the scalded hogs pass over the revolving flukes they are scraped clean at the rate of ten hogs per minute, as we lately witnessed in company with some prominent agricultural gentlemen from the South who had come here to see the commercial emporium of the West, and the greatest live stock, grain and lumber mart of the world. And it is interesting to note the improvement which must have been effected in this marvelous machinery during the past year or so; for, if we remember rightly, the previous account of it was that large hogs could be scraped in ten seconds and small ones almost momentarily. So that there has been a saving of four seconds on big pigs, and possibly a fraction of a second or so on small ones.

Great Pressure upon Powdered Substances.—Mr. Spring, a member of the Belgian Academy of Science, has made several very interesting experiments on the above subject with the following results, as reported in the *Chemiker Zeitung:* In a hollow steel bar, the sides of which were 64-100 of an inch thick, he subjected several powdered substances to a pressure of 20,000 atmospheres (133 tons per square inch). Molten and powdered saltpeter was pressed into a solid hard mass like porcelain. Powdered poplar wood was pressed into a block of much greater hardness than that possessed by the wood itself. The specific weight of the powder was 0.389, and that of the compressed block, 1.328. A powdered grindstone was transformed into a new stone of the same hardness as the original one. The same was the case with chalk.

Improved Rheostat.—This instrument, first invented by Sir Charles Wheatstone for putting a known resistance into a galvanic circuit and thus regulating the current's strength, has been improved by a gentleman in New York city. The bed plate is made of non-conducting material, and in an annular groove in its upper surface there is a film or plate of material that offers considerable resistance to the electrical current. Generally the groove is partly filled with plumbago. One end of the resistant is connected with a battery, and the current is completed through a movable key whose pivot is at the center of the circular groove. The key is provided with a roller which rests upon the plumbago and moves over its surface without abrading it. This rheostat seems especially adapted to the use of physicians and experimenters.

SCIENTIFIC PROGRESS.

Coal Tar Colors.

The wonderful growth of the industries engaged in the production of alizarius (artificial madder) and the coal tar colors generally, is the subject of a paper lately read before the Chemical Section of the London Society of Arts, by W. H. Perkins, F.R.S. The author, whose name is closely associated with the development of these manufactures in England, places the value of all the coal tar colors produced in Europe in 1878 at $15,750,000, divided as follows:

Germany	$10,000,000	France	$1,750,000
England	2,250,000	Switzerland	1,750,000
Total			$15,750,000

Germany has at present 17 coal tar color works, England has six, France five, and Switzerland four; besides which there are three works in Germany and as many in France which manufacture aniline in enormous quantities for the production of coal tar colors. Of alizarine the total production is estimated to be 9,500 tons, representing a money value of $7,225,000.

The noteworthy and instructive thing about this whole subject is the fact that these enormous industries, which have sprung into existence since 1856, are entirely the fruits of theoretical researches in organic chemistry, and the extensive researches may be expected ere long to bear practical fruit, possibly even more valuable. Another subject toward which the eyes of chemists are turned with expectation is the artificial production of indigo upon the commercial scale. The distinguished German chemist, Beyer, has succeeded in putting out of the way the chief difficulty by actually producing it in the laboratory.

The Chromograph.—Mr. Albert Ungerer, of Vienna, has discovered a process of copying letters, which requires no more delicacy of manipulation than the drying of a letter with an ordinary piece of blotting paper. It consists of a slab of gelatinous material having the appearance of soft vulcanized india rubber, contained in a zinc tray. With this there is supplied a small bottle of ink—apparently an aniline compound—with which the circular or drawing to be reproduced is written upon any ordinary piece of paper, and permitted to dry. The writing is then placed face downward on the composition, and the band is then passed lightly over it; after being left for a minute the paper is lifted, and every line and detail of the negative is found upon the composition with absolute precision. The reproduction can now be commenced; a sheet of ordinary paper is pressed upon the negative as in using blotting paper on a letter, and copies may be obtained consecutively to the number of 40 or 50. When the required number has been obtained, the negative is washed off, and the apparatus is ready for fresh work. As the copies can be obtained in several colors at one operation, it will be obvious that the apparatus will be of immense value in engineers' offices for reproducing sketches of machinery for the guidance of intending purchasers or manufacturers, and that it will be not less useful in mine and public companies' offices for the reproduction of reports and balance sheets for the information of, or to be revised by auditors or directors previous to printing them. As soon as known, the chromograph will certainly be almost universally adopted. It is being extensively introduced in England by Mr. Otto Lelm, of Farringdon street, E. C., London.

Fire Extinguisher.—Mr. Watson Smith discovered, several years ago, that crude ammonia water, or gas liquor, as it is called, acts like a charm in extinguishing a fire in a tar distillery. He now recommends that owners of cotton mills, and of tar works, varnish works, etc., should have on their premises a stock of about 1,000 gallons of this gas liquor stored in a tank or old boiler, mounted upon brick-work, and at such an altitude as to give pressure enough for a good jet service in case of fire. There is no reason why this cheap and efficient preventive of destructive conflagrations should not be generally adopted. It may be readily imagined, says Mr. Smith, how a jet of the liquor, thrown into a burning room, would act, the space being so enclosed, when the action is so powerful in a comparatively open space, and with such a refractory substance as burning pitch. It would seem, he adds, that the extinguishing power of the liquor would be even further called forth by a more intensely hot fire, for here, in all propability, the ammonia would be decomposed, and the generated hydrogen and nitrogen gases would help to swell the volume of non-supportive gas, displacing the air, and so choking out the combustion.

New Explosive.—Prof. Emerson Reynolds, of Dublin, has discovered a new explosive, compounded of two substances, which can be kept apart without risk, and can be mixed as required to form a blasting agent. The powder is a mixture of 75 parts of chlorate of potassium with 25 parts of "sulphurea," a body discovered by Prof. Reynolds, which can be obtained cheaply from a waste product of gas manufacture. The new explosive is a white powder, which can be ignited at a lower temperature than gunpowder, and leaves less solid residue.

Utilization of Exhaust Steam.—According to the invention of Mr. N. W. Ericson, of Stockholm, he lets steam of higher pressure, or higher temperature, or both higher pressure and temperature than the pressure or temperature, or both, of the steam which is to be used in a steam engine or for any other purpose, pass into an apparatus for the suction and compression of elastic fluids, in order that the said higher or stronger steam may in such apparatus act as the suction fluid to the said spent steam; this suction and compression apparatus is further connected with the apparatus wherein steam is to be used in order that the spent steam may to a greater or less extent be drawn into the suction and compression apparatus when the acting or higher steam passes through it. The mixture of the acting or drawing steam and the spent steam passes through the delivery pipe of the suction and compression apparatus (and its continuation, as required) either to the place where the thus compressed steam is to be used, or else first through an apparatus containing saturated steam or water, or in so near connection with water that the steam, if in a superheated state, becomes more or less saturated or lowered in temperature, or else into an apparatus wherein the steam, by cooling, is rendered liquid, and the heat thereby given out is used for generation of fresh steam. This latter apparatus may be the steam boiler in which the acting superheated steam is generated, or another steam boiler vessel. The suction and compression apparatus may be any suitable suction and compression apparatus, such as an annular or other jet apparatus.

Draper's Researches on Oxygen in the Sun.—Prof. Henry Draper, on the 13th of June, laid before the Royal Astronomical Society of London the evidence by which he claims to have demonstrated the existence of oxygen in the sun. A writer in the London *Times* (presumably Mr. J. Norman Lockyer) acknowledges the force of the evidence adduced by Prof. Draper. He says: "We think that most spectroscopists will admit that Prof. Draper does not pass beyond the limits of scientific caution in claiming that the coincidence shown in his photographs between the bright lines of oxygen and bright parts of the solar spectrum establishes the probability of the existence of oxygen in the sun. The burden of proof, or rather of disproof, should now fall on those who consider that the coincidence may, after all, be merely accidental. To us it seems that if such evidence as Prof. Draper has obtained is rejected, hardly any spectroscopic evidence can suffice to prove the existence of an element in the sun. We certainly have not stronger evidence in the case of sodium or magnesium, elements which every physicist regards as present in the sun, than Prof. Draper has obtained in the case of oxygen."

Photograph of the Oxygen Spectrum.—The spectrum showed the lines described by Paalzow, O between *b* and E, O close by F, and O between F and G. A band of great intensity, which the author names O, lies near *h*. It is sharply defined toward the red end of the spectrum, but shades away toward the violet extremity. A double band, O_2, near G, has the same character. In the spectrum of hydrogen the three already known hydrogen lines in the blue and violet were seen very distinctly, and also the red line, Hα, coincident with C of the sun. The fourth hydrogen line, coinciding with "*h*" of the sun, was observed with the naked eye by Paalzow and the author, on the application of the simple induction current, in opposition to the assertion of Lockyer that it is only visible at very high temperatures. Upon this assertion he found in part his supposition of the decomposition of hydrogen at elevated temperatures.—*H. W. Vogel, in Scientific American.*

Breakage of Locomotive Axles.—For some time it was suspected by the officers of the Frankfort and Hebra railroad, Germany, that the practice of casting white-metal bearings around steel axles had been the primary cause of several breakages on the line, and a series of experiments were undertaken to ascertain the possibility of such being the case. By repeating the casting process a number of times on the same axle, it was found that in every case, and with every kind of steel tried, cracks appeared sooner or later, sometimes on the second trial, sometimes not till the forty-fifth. The white metal used contained 7 parts copper, 14 parts antimony, and 79 parts zinc, and melted between 810° to 932° Fahr. These experiments, therefore, tended to show that the plan of casting white metal round the axle is a fruitful source of danger.

New Lamp for Passenger Cars.—The well-known inventor, Geo. Westinghouse, has devised a lamp for passenger cars, which he thinks will supersede the ordinary oil lamp. It has been tried with satisfaction on the North British railway, Scotland, for some time. The use of the Westinghouse brake places at disposal a large amount of compressed air. When air is passed over benzine, or similar light hydrocarbons, it becomes saturated with the hydrocarbon vapor, and may then be burned just like ordinary illuminating gas. Beneath each car, therefore, a long cylinder is placed, which is filled with felt, saturated with petroleum. A current of compressed air, entering the cylinder at one end and escaping at the other, is led up to the roof of the car and burned in lamps of very elegant construction.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Aug. 21		Week Ending Aug. 28		Week Ending Sept. 4.		Week Ending Sept. 11	
Alpha	25	23	25¼	23¼	25¼	23¾	27¼	24
Alta	7¼	6½	6⅞	6½	6⅝	6⅞	6⅝	6
Andes	1.15	1	1	90c	1	90c	1	90c
Alps	....	....	....	....	....	....	....	....
Argenta	1.05	80c	1	90c	80c	75c	80c	75c
Atlantic	50c	40c	....	....	....	....	....	....
Aurora Tunnel	....	....	....	....	20c	....	....	....
Baltimore Con	....	....	50c	....	50c	....	60c	....
Belcher	4⅝	3⅞	4.85	4¼	4.65	4½	4⅝	4.55
Belmont	95c	90c	75c	60c	85c	65c	80c	65c
Best & Belcher	19	18	19¼	18¾	18⅞	18	19¼	18
Bullion	6⅝	6¼	7⅜	6	8¼	7¼	6⅞	7⅜
Bechtel	1½	1¼	1.30	1¼	1.30	1¼	1.30	....
Belle Isle	4	3.55	4.30	3⅞	4.45	4.30	3.90	3.55
Bodie	11⅝	10⅞	11	10¼	10⅞	10	10⅞	10¼
Bonton	4½	3.70	4	3.80	3.90	3½	4.10	3.80
Bulwer	9	8½	8¼	....	9	8⅝	9¼	8⅞
Boyle	....	....	....	....	....	....	....	....
Black Hawk	1.30	1¼	1.10	1	1.05	1	1.05	75c
Belvidere	1¼	1	1	75c	75c	....	1	80c
Booker	1.20	1.15	1.35	1.15	1.20	1	1.20	1.05
Caledonia	2¼	2	2	1.70	1.95	1.85	2¼	1.85
California	5¼	4¾	4.80	4.60	4.95	4.80	4.95	4¾
Challenge	2.60	2¼	2.30	....	2.40	2	2¼	2⅜
Chollar	7	6	7¼	6¼	7	6½	7⅞	6⅞
Confidence	11⅞	11	11⅜	10	11	10¼	11¼	10⅞
Con Imperial	1.60	1.40	1.55	1.40	1.70	1.45	2.05	1⅝
Con Virginia	4⅞	4.55	4.85	4.60	4.85	4⅞	4.90	4⅞
Crown Point	4.70	4¼	4.35	4	5.80	3.70	3.90	3.70
Con Washoe	75c	55c	1.05	75c	....	....	....	....
Champion	50c	40c	50c	45c	45c	40c	40c	30c
Concordia	....	....	....	....	10c	5c	10c	5c
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	....	....	25c	....	10c	....	20c	15c
Eureka Con	16	14¼	16⅞	16½	16⅞	16	16⅞	16¼
Exchequer	6⅞	6½	6½	6	6⅞	6¼	7⅞	6⅞
Endowment	45c	....	40c	....	50c	45c	30c	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	3.90	2.90	3.80	2.60	3.55	2⅞	2⅞	2½
Gila	1½	1¼	1.10	50c	65c	50c	60c	55c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	13⅞	13	12⅞	....	....	....	12	....
Goodshaw	45c	....	45c	40c	50c	40c	50c	35c
Gould & Curry	12½	11¼	12½	11¼	12	11¼	12⅞	11⅞
Hale & Norcross	14¼	13¼	15¼	13⅞	14⅞	14	15	14¼
Hillside	1.40	1	1½	1¼	1.60	1¼	1.85	1.65
Highbridge	....	....	....	....	5c	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	15c	....	10c	5c	5c	....	10c	5c
Independence	2.60	2.10	2.20	2	2.15	2.10	2.20	2.05
Julia	4.55	4.10	4.35	4.05	4.40	4.15	4.90	4.15
Justice	3.65	3.10	3⅞	3	3	2.60	4½	2⅞
Jackson	5	4½	5	4⅞	....	....	4	....
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	1	....	1	....	2	1⅞
Kentuck	5	4½	4¼	4	4¼	4	4¼	4
Kossuth	....	....	....	....	20c	....	20c	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	1	55c	60c	50c	60c	55c	60c	50c
Lady Wash	1.30	1.10	1.20	1.10	1.20	1.05	1.30	55c
Leopard	1	40c	60c	30c	40c	30c	35c	25c
Leviathan	40c	25c	25c	....	30c	25c	55c	25c
Leeds	75c	70c	....	....	70c	65c	70c	....
Lee	....	....	....	....	....	....	....	....
May Belle	....	....	25c	....	25c	....	....	....
Modoc	1½	1.15	1.10	1	1½	1	....	....
Manhattan	3	2	3	2⅞	3	2⅞	3½	3
Martin White	3.70	3	3½	2⅞	2.20	2	2.10	1.20
McClinton	1	75c	1	75c	1	70c	75c	65c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	36⅞	32	35	32⅞	35	33½	37	33
Mides	....	....	....	....	....	....	....	....
Morning Star	3	....	3.15	....	....	....	....	....
North Con Virginia	9½	9	8½	....	8	7⅞	8	7½
New York	90c	70c	70c	60c	90c	55c	70c	60c
Northern Belle	4¼	4	4	3.95	3⅞	3½	4	4⅞
New Coso	....	....	....	....	....	....	....	....
Navajo	30c	....	35c	25c	30c	25c	30c	25c
Occidental	1.55	1.30	1.40	65c	1	75c	1.65	90c
Ophir	38	35	37	35½	36⅞	35⅞	38¼	35
Oriental	70c	35c	40c	35c	40c	30c	50c	25c
Overman	9⅞	9	9	8¼	9	6⅞	10	8⅞
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	1¼	....	2½	....
Phil Sheridan	60c	40c	....	....	40c	....	....	....
Potosi	5⅜	4.70	5¼	4¼	5⅜	4.85	6½	5½
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	3⅞	95c	90c	65c	75	65c	75c	65c
Richer	25c	10c	20c	15c	40c	15c	30c	25c
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	45c	....	....	....	....	....	....	....
Savage	14	12⅞	12¼	12⅞	15	14⅞	15⅞	14¼
Seg Belcher	....	....	14	....	24	23½	23	22½
Sierra Nevada	49¼	39⅞	42	39⅞	43⅞	41¼	47¼	41
Silver Hill	1⅞	1.60	1.55	1½	1.60	1½	2	1.60
Silver King	....	....	5	4	....	....	4½	....
Silver Prize	25c	10c	20c	....	15c	10c	10c	....
Succor	....	....	15c	10c	15c	10c	10c	5c
Summit	2	1⅞	1.80	1⅞	1.70	1½	1½	1¼
Scorpion	2.95	2.40	2⅞	2.30	2.70	2½	3	2½
Solid Silver	....	....	....	....	....	....	....	....
South Bodie	35c	10c	35c	30c	30c	....	35c	30c
South Standard	15c	10c	15c	....	5c	....	10c	....
Star	45c	40c	....	....	45c	40c	40c	....
St. Louis	....	....	30c	....	....	....	40c	....
Syndicate	6⅞	4½	7	6⅞	6⅝	5⅞	6	5⅞
Tioga Con	3.95	3½	4	3.55	3.55	3.45	3.60	2.95
Tiptop	95c	....	....	....	90c	75c	1	90c
Trojan	30c	25c	30c	....	30c	25c	40c	25c
Union Con	67½	47½	57½	50	62½	65½	73½	69
Utah	22½	18½	19½	18½	19	18	21	18⅞
Vermont Con	....	....	....	....	....	....	....	....
Ward	2	1⅞	1.95	1.80	2	1.85	2.95	1.95
Wells Fargo	15c	10c	10c	....	....	....	10c	5c
Woodville	50c	....	45c	40c	40c	35c	45c	35c
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	17⅞	16⅝	16⅞	15¼	17	15⅞	18	16¼

Sales at S. F. Stock Exchange.

Friday A.M., Sept. 5.

275 Alta....6⅝@6½
70 Andes....95c
10 Alpha....24
60 Belcher....4.60
70 Best & Belcher...18½@18
605 Benton....3⅞@3.80
855 Bullion....7⅝@7⅜
350 C Dorado....1.70@1⅝
130 California....4.95@4.90
100 Con Virginia....4.90
50 Chollar....6⅞
60 Challenge....2.40@2½
255 Con Imperial....1⅝@1.70
140 Crown Point....3.70@3⅞
40 Caledonia....1.90
60 Exchequer....6⅝
1050 Flowery....40@35c
100 Fairfax....1
375 Gould & Curry...11⅞@11½
65 Hale & Nor....14⅜@14½
390 Justice....2⅞@2.80
240 Julia....4¼@4.20
100 Kossuth....20c
115 Kentuck....4@4½
130 Lady Wash....1.15@1.20
400 Leviathan....25c
200 Lady Bryan....55@50c
350 Mackey....1
100 Mt View....2.60@2½
525 Mexican....33⅞@33
540 N Bonanza....1.30@1.36
20 North Con Vir....7½
670 New York....70@65c
100 Occidental....1
65 Overman....8⅞
135 Ophir....35¼@35
215 Potosi....6½
500 S Utah....5c
350 Silver Hill....1.60@1.65
785 Scorpion....2.60
200 Savage....14⅝
170 Sierra Nevada....41@41¼
10 Utah....18½
230 Union Con....69@59½
535 Ward....2@1.95
100 Woodville....40c
345 Yellow Jacket...16½@16⅞

AFTERNOON SESSION.

800 Argenta....75c
400 Adenda....50@45c
1000 B Chief....60c
915 Belle Isle....3.70@3.55
230 Bulwer....9@8⅞
250 Booker....1½@1.05
60 Black Hawk....1
430 Belvidere....90c@1
5495 Big Prize....40@45c
235 Bodie....10½@10⅞
150 Bechtel....1.30
75 Belmont....80c
100 Concordia....10c
400 Champion....40c
315 C Pacific....6⅞@7
100 Dudley....75c
170 Eureka Con....16½
450 Gila....60c
50 Grand Prize....2⅞
70 Golden Terra....12
55 Goodshaw....40c
50 Giant & O A....4
50 Hillside....1.80
200 Independence..2.10@2.05
75 Jackson....1
275 Jupiter....1.80@1⅝
60 K K Con....2@1⅞
350 Leopard....35c
25 Manhattan....3
200 Martin White....2.10
1020 Mono....6½@6⅞
45 Northern Belle....3⅞
500 N Belle Is....40c
400 Oriental....30@25c
150 Orient....15c
150 Phenix....2½
835 Paradise....2.20@2⅛
50 Queen Bee....55c
600 Ray'd & Ely....65@70c
100 Star....40c
100 Silver Prize....10c
100 S Bulwer....70c
60 S Bodie....30c
500 S Standard....10c
80 Summit....1½@1.46
300 Syndicate....5⅞@6
250 Tuscarora....20@15c
200 Tioga Con....3½@3.60
195 Tiptop....90@95c
150 Wales....8

Saturday A.M., Sept. 6.

30 Alpha....24
350 Alta....6½@6
70 Andes....90c@1
500 Argenta....75c
110 Best & Belcher....18½
90 Belcher....4.60@4.55
280 Bullion....7¾@7⅞
420 Benton....3.80
5400 Big Prize....40c
150 Bello Isle....3.65
100 Belvidere....80c
45 Bechtel....1.30
300 B Chief....60c
200 Boston....1.30
230 Con Dorado....1⅝
340 Con Virginia....4.90
230 Chollar....7@6⅞
1700 Con Imperial..1.65@1.70
350 C P Ravine....25c
125 Caledonia....1.85
600 California....4.90
25 C Pacific....8
500 Dudley....75c
760 Exchequer....6⅝@6⅞
105 Eureka Con....16½
100 Fairfax....1
1000 Flowery....55@60c
310 Gould & Curry....11½
730 Gila....60c
525 Grand Prixe....2⅞@2½
220 H & Norcross....14¼@14½
565 Hillside....1.85
15 Hussey....10c
100 Independence....2.10
340 Julia....4.20@4.15
265 Justice....2.80
545 Jupiter....1½@1.55
650 Kossuth....20c
320 Lady Bryan....55c
270 Lady Wash....1.20@1.15
200 Leviathan....50c
275 Mackey....1
170 Mexican....33⅞@33½
25 McClinton....65c
25 Manhattan....3.10
920 Mono....6⅞@6½
40 Mammoth....9
170 M White....2.10
940 New York....60@65c
550 N Bonanza....1.30
1900 N Belle Is....40c
80 Northern Belle..3⅞@3.95
100 Noonday....3½
145 Ophir....35⅞@35½
40 Overman....8½
250 Occidental....95c
300 Oriental....25@30c
270 Potosi....5½@5⅜
200 Plutus....1.90
440 Paradise....2⅛@2.15
195 Richer....25c
290 Savage....14⅝@14½
35 Sierra Nevada....41½
50 Silver Hill....1.60
500 Scorpion....2.60@2½
200 Syndicate....5½@5½
25 Summit....1.40
200 South Standard....10c
100 S Bulwer....70c
150 S Bodie....30c
50 Trojan....25c
250 Tioga Con....3.40@3¼
100 Tuscarora....15c
195 Union Con....59@59½
40 Utah....18½
5500 University....25c
30 Wales....8½
500 Ward....2.15@2.10
20 Yellow Jacket....16½

Monday A.M., Sept. 8.

120 Alpha....25½@25¼
360 Alta....6½@6
150 Andes....95@90c
185 Benton....3.90@3.95
180 Best & Belcher....19
510 Bullion....8¼@8⅜
120 Belcher....4.60@4.65
40 Confidence....10½
255 California....4.95@4.90
450 C Dorado....1½
315 Con Virginia...4.90@4.85
350 Chollar....7@7¼
170 Caledonia....1.90@2
1330 Con Imperial....1⅞@1.70
100 Crown Point....3.70
200 C P Ravine....25c
590 Exchequer....7¼@7⅜
1425 Flowery....60@50c
380 Gould & Curry...11⅞@11½
185 Hale & Nor....14⅜@14½
905 Julia....4½@4.45
95 Justice....3.85@3.90
100 Kentuck....4.20@4⅜
250 Lady Bryan....60c
350 Lady Wash....1.20
120 Mexican....34½@34¼
300 Mary Ann....80c
390 Mackey....1
750 N Bonanza....1.40@1.35
120 N Con Virginia....8
425 New York....60@65c
60 Occidental....90c@1
135 Ophir....35½@36
110 Overman....8⅞
350 Potosi....5¼
100 S Utah....5c
635 Scorpion....2.60@2½
65 Silver Hill....1.60@1.65
140 Savage....15
535 Sierra Nevada....42⅞@42
70 Utah....20@20½
925 Union Con....62@65
100 Wells-Fargo....5c
2145 Ward....2.70@2.95
95 Woodville....35c
170 Yellow Jacket....16⅝@16½

AFTERNOON SESSION.

100 Adenda....50c
125 Argenta....75c
130 Bulwer....9@9½
300 Booker....1⅛@1.15
300 Belmont....80c
500 B Chief....65c
220 Boston....1.30
50 Black Hawk....1.05
45 Bodie....10½
245 Bechtel....1.30
4000 Big Prize....45c
665 Belle Isle....3.80@3⅞
220 Champion....30@35c
100 Concordia....5c
500 Crœsus....25c
30 C Pacific....7
400 Day....15@20c
100 Dudley....75c
285 Eureka Con....16½
300 Endowment....30c
225 Goodshaw....40c
1340 Gila....60@55c
610 Grand Prize....2⅞@2½
200 Hamburg....25c
10 Hillside....1.65
500 Independence..2.20@2.15
150 Jupiter....1.60
10 Jackson....4
410 Leopard....30c
15 Mammoth....9½
155 Mono....6⅞@6½
250 M White....1.20
190 McClintou....65c
85 Mt Diablo....4½@4⅜
200 Manhattan....3½
150 Northern Belle....3.95
1745 N Belle Is....40@30c
10 Noonday....3½
400 Navajo....25c
180 Orient....20@15c
860 Oriental....30@35c
130 Paradise....2.45@2⅞
75 Queen Bee....50c
75 Richer....30@25c
260 Raymond & Ely..65@70c
50 Real del Monte....2
450 S Bodie....30@35c
100 S Bulwer....70c
100 S Standard....10c
50 Summit....1.40
45 Syndicate....5¾@5⅞
50 Star....40c
370 Tioga Con....3@3.15
200 Tuscarora....10c
500 University....25c
50 Vortex....55c
100 Wales....8⅞

Tuesday A.M., Sept. 9.

220 Alpha....27¼
500 Alta....6⅝
240 Andes....95c
1240 Bullion....8⅜@6⅝
170 Best & Belcher....19@19¼
1030 Belcher....4½@4.70
260 Benton....3.95@4
65 Confidence....11¼@11
290 Con Virginia....4.85
585 Chollar....7¼@7⅞
300 Con Dorado....1⅞
185 California....4⅞@4.80
275 C P Ravine....25c
3960 Con Imperial....2@2.05
80 Challenge....2.40
395 Caledonia....2⅛@2.05
230 Crown Point..3.90@3.85
375 Exchequer....7⅞@7⅞
600 Flowery....60c
320 Gould & Curry...12⅞@12⅝
90 H & Norcross....14⅝@15
555 Justice....3.80@3.90
440 Julia....4.65@4.70
100 Kentuck....4½
425 Leviathan....55@50c
430 Lady Wash....1⅛@1.30
510 L Bryan....60@55c
1360 Mexican....36½@37
810 Mackey....1.10@1.05
110 Mt View....2½@2.60
325 N Bonanza....1.40@1.35
1180 New York....60@65c
180 North Con Vir....8@7⅞
345 Occidental....95c@1
150 Overman....9½@9⅞
665 Ophir....36½@37
725 Potosi....6
180 Plutus....2.05
10 Seg Belcher....23
250 Savage....15⅞@15⅝
510 Scorpion....2.60@2⅝
1205 Sierra Nevada....45@47
120 Silver Hill....1⅞@1.60
100 Trojan....30c
150 Utah....21@20½
1240 Union Con....72@69
1405 Ward....2.70@2.65
200 Woodville....40c
355 Yellow Jacket....17⅞

AFTERNOON SESSION.

1580 Argenta....75c
200 Albion....20c
325 Belle Isle....3⅞@3.90
725 Belmont....70@65c
300 B Chief....70c
20 Booker....1.20
915 Black Hawk....75c@1
100 Boston....1.30
90 Bulwer....9@8⅞
2220 Big Prize....45c
30 Bechtel....1.30
50 C Pacific....7@6⅞
100 Crœsus....20c
150 Champion....40@35c
200 Defiance....25c
50 Day....15c
300 Dudley....70@60c
300 Endowment....30c
130 Eureka Con....16½
145 Grand Prize....2.70@2.60
440 Gila....60c
100 Giant & O A....5⅞
300 Goodshaw....50c
350 Hussey....5c
750 Hillside....1.70@1.85
375 Indepeudence..2.10@2.15
110 Jupiter....1.60@1.70
200 Leopard....30c
100 Leeds....70c
300 Martin White....1.90@2
85 Manhattan....3½
100 Mono....6½
520 Mammoth....9½@9
100 McClinton....75@70c
60 Noonday....3½
1600 N Belle Is....35c
250 Northern Belle....3.95@4
400 Navajo....30c
1000 Oriental....30@35c
365 Paradise....2.55@2⅞
250 Queen Bee....60c
100 Raymond & Ely....70c
100 S Bodie....30c
175 Syndicate....6
10 Silver King....4½
600 S Bulwer....65c
45 Summit....1.40
610 Tioga....3
180 Tiptop....1

Wed'sday A.M., Sept. 10.

440 Alta....6⅝@6⅞
150 Alpha....27¼
475 Andes....95c@1
505 Bullion....8⅝
470 Belcher....4.80@4⅞
40 Best & Belcher....19
330 Benton....4.10@4.05
350 Con Dorado....1⅞
120 California....4.80
450 Caledonia....2@2.05
445 Challenge....2.60@2½
70 Confidence....11½
965 Con Imperial....1.95@2
95 Crown Point...3.80@3.85
110 Con Virginia...4.85@4.80
130 Chollar....7¾@7⅞
300 C P Ravine....25c
555 Exchequer....7⅞
450 Flowery....60@70c
480 Gould & Curry...12⅞@12⅝
275 Hale & Nor....15
1655 Justice....4.30@4½
830 Julia....4.70@4.90
260 Kentuck....4½@4.30
200 Leviathan....50c
365 Lady Bryan....55c
710 Lady Wash....1¼@1.30
800 Mexican....38@37⅞
775 Mackey....1.10@1.15
100 Mary Ann....85c
10 North Con Vir....8
325 N Bonanza....1.40
1320 New York....60@65c
225 Occidental....1½@1.05
100 Overman....10
575 Ophir....38@38½
2070 Potosi....6½@6⅞
530 Silver Hill....1.90@2
235 Savage....15½@15⅝
530 Sierra Nevada....47@47½
1525 Scorpion....2⅞@3
100 Succor....5c
1595 Trojan....30@35c
605 Union Con....72½@73½
325 Utah....21@20½
100 Woodville....40c
600 Wells Fargo....10c
1225 Ward....2.70@2⅞
375 Yellow Jacket....17⅞@18

AFTERNOON SESSION.

1110 Argenta....75@80c
50 Addenda....40c
450 Black Hawk....1
150 Belvidere....80c
2850 Big Prize....50c
500 Bodie....10⅞
150 Bechtel....1.30
425 Belle Isle....3.90@3⅞
160 Bulwer....9
360 Booker....1½@1.20
1000 Belmont....65c
50 Caledonia (B H)....3
30 C Pacific....7@6⅞
100 Champion....35c
20 Dudley....75c
200 Defiance....25c
2800 Day....15@20c
235 Eureka Con....16⅞
300 Goodshaw....40@35c
160 Grand Prize....2.70
75 Giant & O A....5½
400 Gila....60@55c
600 Hussey....5c
400 Hillside....1.65@1.85
100 Independence....2.15
110 Jupiter....1.60@1.65
370 Leopard....25c
120 McClinton....75@70c
175 Mammoth....9½@9
520 Martin White....1.80@1⅞
130 Manhattan....3
300 Metallic....40c
100 Mono....6½
145 Mt Diablo....4½
810 Northern Belle....4
1325 N Belle Is....45@40c
150 Noonday....3½
280 Navajo....25c
1950 Oriental....40@50c
125 Paradise....2.45
25 Queen Bee....60c
10 Real Del Monte....2
10 Raymond & E... 70@75c
400 Richer....30c
50 South Standard....10c
55 Summit....1½
50 S Bulwer....60c
545 Tioga Con....3@2.95
80 Wales....9

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Con M Co	Nevada	10	1 00	Aug 7	Sept 11	Oct 1	Wm Willis	309 Montgomery st
Argonaut M & M Co	California	1	05	Aug 11	Sept 15	Oct 6	J L Fields	240 Montgomery st
Belcher S M Co	Nevada	19	1 00	July 21	Aug 26	Sept 16	Jno Crockett	203 Bush st
Bullion M Co	Nevada	11	50	Aug 12	Sept 16	Oct 7	J M Brazell	418 California st
Caledonia S M Co	Nevada	28	50	Aug 21	Sept 26	Oct 17	R Wegener	414 California st
Champion M Co	Nevada		05	July 26	Aug 31	Sep 30	G C Hurlbut	525 Commercial st
Chollar M Co	Nevada	1	50	Aug 29	Oct 3	Oct 24	W E Dean	203 Bush st
Crown Point G & S M Co	Nevada	38	1 00	Aug 27	Oct 1	Oct 22	James Newlands	203 Bush st
Dudley M Co	California	5	50	Aug 14	Sept 17	Oct 13	E C Masteu	22 Nevada Block
Eagle S M Co	Nevada	14	10	Aug 4	Sept 10	Sept 30	J E Byrne	633 Kearney st
Flowery M Co	Nevada	2	25	Aug 6	Sept 10	Sept 30	W W Stetson	309 Montgomery st
Gold Deposit G & S M Co	California	1	25	July 25	Aug 28	Sept 16	J M Buffington	209 California st
Goodshaw M Co	California	4	25	July 9	Aug 23	Sept 30	V Fernhach	327 Pine st
Hale & Norcross S M Co	Nevada	62	1 00	Sept 9	Oct 14	Nov 4	J F Lightner	58 Nevada Block
Hussey Con G & S M Co	Nevada	9	15	Aug 25	Sept 30	Oct 21	Jno E Dixon	20 S. F. Stock Ex.
Justice M Co	Nevada	—	1 00	———	Sept 11	Sept 30	R E Kelley	419 California st
K K Con M Co	Nevada	—	1 00	Aug 1	Sept 3	Oct 1	B B Minor	309 Montgomery st
Leopard M Co	Nevada	12	50	Aug 23	Sept 26	Oct 17	Jno E Dixon	20 S F Stock Ex.
Leviathan M Co	Nevada	9	25	Aug 6	Sept 9	Sept 30	F E Luty	330 Pine st
McCrackin Con M Co	Arizona	3	25	July 29	Aug 29	Sept 17	H Aug Whiting	211 Sansome st
Mexican G & S M Co	Nevada	8	1 50	Sept 11	Oct 15	Nov 6	C L McCoy	203 Bush st
North Bonanza M Co	Nevada	3	25	Aug 13	Sept 17	Oct 7	W W Stetson	309 Montgomery st
Original Keystone S M Co	Nevada	2	25	July 28	Sept 1	Sept 28	F E Luty	330 Pine st
Occidental Con G M Co	California	2	.03	Aug 11	Sept 23	Oct 20	W T Smith	402 Montgomery st
Potosi M Co	Nevada	1	50	Aug 29	Oct 7	Oct 28	W E Dean	203 Bush st
Sierra Nevada S M Co	Nevada	59	2 00	Aug 30	Oct 3	Oct 22	W W Stetson	309 Montgomery st
South Bodie G M Co	California	1	25	July 18	July 25	Sept 17	H Deas	309 Montgomery s
South Bulwer	California	4	15	July 16	Aug 20	Sept 12	Wm Stuart	320 Sansome s
Succor M & M Co	Nevada	24	25	Aug 30	Oct 3	Oct 23	Wm H Watson	302 Montgomery st
Tellurium G & S M Co	California	19	10	Aug 1	Sept 1	Sept 24	J M Litchfield	415 Montgomery st
Tioga Con M Co	California	7	30	Sept 10	Oct 15	Nov 4	W H Lent	62 Nevada Block
Tuscarora M & M Co	Nevada	4	10	Aug 2	Sept 5	Sept 30	M E Sperling	309 California st
University G M Co	California	3	20	Aug 21	Sept 24	Oct 15	W L Oliver	328 Montgomery st
Union Con S M Co	Nevada	14	2 00	July 31	Sept 4	Sept 23	J M Buffington	309 California st
William Penn	Nevada	5	05	July 12	Aug 20	Sept 15	O J Humphrey	328 Montgomery st
Yellow Jacket S M Co	Nevada	33	1 00	Aug 4	Sept 8	Oct 8	Mercer Otey	Gold Hill, Nevada

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company	Location	No.	Amt.	Levied	Delinq'nt	Sale	Secretary	Place of Business
Belle Isle M Co	Nevada	Jno E Dixon			20 S F Stock Ex		Annual	Sept 25
Crœsus G & S M Co	California	2	10	Aug 22	Sept 23	Oct 11	E Huestis	328 Montgomery st
Dardanelles M Co	Nevada	7	50	Sept 9	Oct 10	Oct 27	H O Hinman	411 California st
Dudley M Co	California	5	50	Aug 14	Sept 17	Oct 13	E. C. Masten	309 Montgomery st
Harrington M Co	California	1	20	Aug 11	Sept 18	Oct 8	W W Bausman	426 California st
Keystone S M Co	California	2	25	July 28	Sep 16	Oct 6	F E Luty	330 Pine st
North Scorpion M Co	Nevada	1	10	Aug 11	Sept 20	Oct 10	T B Ludlum	318 Pine st
Original Keystone S M Co	Nevada	2	25	July 28	Sept 1	Sept 28	F E Luty	330 Pine
Occidental M Co	Nevada	5	60	Aug 11	Sept 15	Oct 6	A K Purhrow	309 Montgomery st
Santa Mina G M Co	California	1	15	Aug 29	Oct 2	Oct 22	J H Sayre	330 Pine st
San Pedro G & S M Co	California	2	05	July 29	Aug 29	Sept 15	T A White	113 Leidesdorff st
Sherwood Con M Co	Nevada	2	10	Sept 1	Oct 6	Oct 23	H S Stone	309 California st
South Utah M Co	Nevada	3	10	Sept 5	Oct 6	Oct 25	O S Healy	45 Merchants Ex
South Comstock G & S M Co	Nevada	6	25	Sept 9	Oct 13	Nov 3	J M Buffington	309 California st
Red Hill H M & W Co	California	2	03	Sept 1	Oct 2	Oct 18	A B Paul	228 Montgomery st
Richer M Co	California	3	25	July 13	Sept 3	Sept 23	W H Lent	309 Montgomery

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Alaska M Co	———	O W Crane	10 Leidesdorff st	Annual	Sept 22
Belle Isle M Co	Nevada	J E Dixon	20 S F Stock Ex	Annual	Sept 25
Cherokee Flat Blue G M Co	California	R N VanBrunt	318 Pine st	Special	Sept 23
Curtis Con M Co	———	J M Buffington	309 California st	Stockholders	Sept 23
Grand Prize M Co	———	John E Dixon	S. F. Stock Ex.	Annual	Sept 16
Humboldt M Co	———	W L Oliver	328 Montgomery st	Annual	Sept 17
Jupiter M Co	California	E O Masten	22 Nevada Block	Annual	Sept 15
Nevada M Co	Nevada	J T McGeoghan	318 Pine st	Annual	Sept 23
Niagara G & S M Co	———	O A Morse	217 Sansome st	Annual	Sept 23
Pittsburg M Co	———	R Wegenor	414 California st	Annual	Sept 20
Reno M Co	Nevada	J T McGeoghan	318 Pine st	Annual	Sept 23
South Bulwer G M Co	California	J Miller	320 Sansome st	Annual	Sept 16
Trojan M Co	Nevada	D Wildor	328 Montgomery st	Special	Sept 25

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Belle Isle M Co	Nevada	John E Dixon	Stock Exchange	50	Aug 5
Bodie Con M Co	California	W H Lent	Nevada Block	1 00	Aug 1
California M Co	Nevada	C P Gordon	23 Nevada Block	50	Aug 17
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	50	Aug 16
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	1 00	July 21
Independence M Co	Nevada	John E Dixon	Stock Exchange	25	Aug 21
Indian Queen M & M Co	———	A K Durbrow	69 Nevada Block	20	Aug 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	July 26
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	30	July 28
Montezuma M & M Co	———	J T McGeoghegan	318 Pine st	25	Aug 12
Standard Con M Co	California	Wm Willis	309 Montgomery st	60	Aug 12

SALES OF LAST WEEK ANO THIS COMPARED

Thursday A.M., Sept. 4.

30 Alpha....24
275 Alta....6⅝@6½
200 Andes....90c
230 Best & Belcher..18¼@18½
510 Belcher....4½@4.55
1300 Bullion....8½@8
420 Benton....3.85@3⅞
120 Con Virginia....4.30@4⅜
150 Chollar....7
60 California....4.85@4.80
100 Confidence....10⅞
50 Crown Point....5.80
1310 Con Imperial..1.70@1.65
25 Caledonia....1.90
250 C P Ravine....25c
300 C Dorado....1.70
110 Exchequer....6⅝@6⅞
850 Flowery....40@45c
170 Gould & Curry....11⅞@11¼
170 Hale & Nor....14⅜@14½
535 Justice....2.90@2.80
215 Julia....4½@4.30
180 Kentuck....4
45 L Bryan....55c
500 Leviathan....25@30c
550 Mexican....35@34½
250 Mackey....1
895 New York....65@70c
150 N Bonanza....1.45
85 Ophir....36⅞
20 Overman....8⅞@9
85 Occidental....1
95 Potosi....5½@5⅞
100 Plutus....1.90
410 Savage....14⅞@15
85 Sierra Nevada....43@43⅞
200 Succor....15c
270 Silver Hill....1.60@1.55
35 Scorpion....2.55@2.60
200 S Utah....5c
100 Trojan....30c
15 Utah....19
420 Union Con....62½@61½
700 Ward....2
145 Yellow Jacket....17

AFTERNOON SESSION.

2330 Argenta....80@75c
10 Aurora T....25c
10 Bulwer....9
6700 Big Prize....35@40c
170 Bodie....10⅞
60 Bechtel....1.30
680 Boston....1.30@1.35
155 Booker....1.05@1.10
70 Black Hawk....1
200 Belvidere....80c
1250 Belle Isle....4.20@4¼
610 Champion....40c
350 Concordia....10c
100 C Pacific....6⅞
230 Dudley....80@75c
115 Eureka Con....16½
100 Endowment....35c
375 Gila....55c
100 Giant & O A....5⅞
20 Goodshaw....40c
260 Grand Prize....3
440 Hillside....1.60@1⅞
75 Jupiter....1⅞
300 Leopard....40c
225 McClinton....70@75c
165 Mono....6⅞@7
730 Martin White....2@2.10
415 Manhattan....3
130 Northern Belle. 3⅞@3.90
70 Noonday....3⅞
80 Navajo....30c
100 Oriental....25c
100 Orient....20c
700 Paradise....2.60@2½
30 Real del Monte....2
70 Raymond & Ely..65@70c
50 S Bodie....25c
440 S Bulwer....65@75c
200 Syndicate....5⅞
700 S Standard....5c
250 Summit....1½
50 Star....40c
50 Tuscarora....20c
200 Tioga Con....3.60@3½
300 University....30c
50 Wales....8½

Thursd'y A.M., Sept. 11.

195 Alpha....25⅞@25½
185 Alta....6½@6⅝
280 Andes....1
50 B & Belcher....18½
170 Belcher....4⅞
745 Bullion....8½@8⅞
930 Baltimore Con....50c
400 Benton....4.05@4
200 Crown Point....3.80
455 California....4.80@4⅞
1300 Con Imperial..1.85@1.90
205 Con Virginia....4.80@4⅞
50 Chollar....7½
300 Caledonia....2@1.95
40 Confidence....11
70 Challenge....2½
150 C P Ravine....25c
430 Con Dorado....1⅞@1.70
430 Exchequer....7⅞@7¼
1245 Flowery....65@70c
120 Gould & Curry....11⅞
465 Hale & Nor....14⅞@14⅞
460 Justice....4.05@4.15
340 Julia....4.70@4⅞
235 Kentuck....4½
50 Leviathan....50c
445 Lady Bryan....50@55c
485 Lady Wash....1⅞@1.20
680 Mexican....35⅞@35½
820 Mackey....1.15
100 Mt View....2.60
50 Mary Ann....85c
1220 New York....65c
320 North Con Vir....8
530 N Bonanza....1.40
250 Ophir....37½@37⅞
30 Overman....9⅞@9⅞
160 Occidental....1.65@1.60
1175 Potosi....6½@6
100 Plutus....2.10
25 Savage....14½
460 Sierra Nevada....45@44
400 Succor....10c
100 Silver Hill....1⅞
10 Seg Belcher....22½
635 Scorpion....2.80@2⅞
85 St Louis....40c
2200 Trojan....40@35c
100 Utah....20@19⅞
795 Union....67½@68½
1215 Ward....2.60@2.40
150 Woodville....40@45c
255 Yellow Jacket....17

AFTERNOON SESSION.

1500 Argenta....75c
300 Albion....20c
100 Addenda....40c
125 Belle Isle....4.10@4.20
800 Booker....1.20@1.30
700 Black Hawk....1
3500 Big Prize....50@55c
50 Bodie....10⅞
590 Bechtel....1.30@1¼
75 Boston....1.30@1¼
100 Concordia....10c
600 Champion....30c
1600 Day....15@20c
200 Defiance....60c
105 Dudley....95@90c
485 Eureka Con....17
210 Grand Prize...2.70@2.60
3100 Gila....50@55c
300 Goodshaw....40@35c
300 Hussey....5c
195 Hillside....1.80@1.90
100 Independence....2.20
480 Jupiter....1⅞@1.60
1050 Leopard....25c
200 Leeds....65c
450 M White....1⅞
125 Mono....6⅞
500 Metallic....40c
210 McClinton....60@65c
80 Manhattan....3½
30 Mammoth....9½
150 Noonday....3
150 Northern Belle....4
275 Navajo....25@30c
1700 N Belle Is....45c
1720 Oriental....50@45c
400 Paradise....2½
100 Richer....30c
320 Raymond & E....70@75c
100 S Bodie....35c
50 Star....40c
125 Summit....1.35@1.40
775 S Bulwer....60@65c
140 Syndicate....5⅞
170 Tioga Con....2.80@2.60
450 Tuscarora....15c
100 Tiptop....85c
240 Vortex....60c

Pacific Board—Latest Sales.

Wed'sday A.M., Sept. 10.

10 Alpha....27
50 Andes....95c
100 Belcher....4.80
595 Benton....4.05@4.10
170 Best & Belcher....19
160 Bullion....8.70@8.55
50 Caledonia....2.10
70 California....4.85@4.80
140 Con Virginia....4.85
130 Crown Point...3.70@3.85
500 Con Imperial....1.95
90 Exchequer....7⅞
240 Gould & Curry....12¼
10 Hale & Nor....15
420 Justice....4½@4⅞
30 Kentuck....4½
110 Mexican....37½@37⅞
100 New York....65c
170 Ophir....37⅝@38½
40 Overman....9⅞@10
280 Potosi....6⅝@6.45
10 Savage....15⅝
200 Silver Hill....1.85@1⅞
60 S Nevada....46⅞@46½
30 Union....73
90 Yellow Jacket...17⅞@17⅞

AFTERNOON SESSION.

50 Andes....1
50 Alta....6½
195 Bonton....4½@4.05
20 Bullion....8⅞@8½
30 Belcher....4.80
20 Crown Point....3.65
20 Con Imperial....1.95
70 Hale & Nor....14⅞@14⅞
20 Justice....4.20
110 Mexican....36⅞@36
100 N Standard....2.20
35 Ophir....38¼@38½
100 S Bodie....20c
100 Trojan....37½c
40 Union Con....68½@69⅞
10 Yellow Jacket....17⅞

California Board—Latest Sales.

Wed'sday A.M., Sept. 10.

20 Alpha....27
50 Alta....6½
1000 Atlantic....20@15c
200 Atlas....3c
40 Belcher....4.80@4.85
20 Best & Belcher...19¼@19½
30 Bullion....8⅝@8⅞
100 Black Hawk....75c
30 California....4⅞@4.80
10 Con Virginia....4.80
200 Con Imperial....2
40 Crown Point....3⅞@3.95
30 Challenge....2½
150 Caledonia....2 05@2.10
50 Exchequer....7½@7⅞
30 Gould & Curry...12½@12⅞
30 Hale & Nor....14⅞
40 Julia....4.60@4.65
70 Justice....4.10@4.15
120 Leviathan....50c
20 Mexican....37½

100 Monumental	3c
300 Mint	9@10c
600 North Carson	2c
20 Ophir	37@37½
30 Potosi	6½@6¾
20 Savage	15
20 Sierra Nevada	46
100 South Bodie	20c
170 Silver Hill	1.80@1½
30 Union Con	72
20 Yellow Jacket	17@17½
AFTERNOON SESSION.	
30 Alpha	37½
30 Alta	6½
400 Atlas	3@1c
2300 Atlantic	14@10c
110 Andes	1
50 Belcher	4.80
30 Best & Belcher	19@19½
30 Bullion	8½
100 Black Hawk	80c
400 Big Prize	45c
20 California	4.80
50 Con Virginia	4.80
100 Con Imperial	1.95
30 Crown Point	3.80
30 Challenge	24
40 Caledonia	2.15
10 Coso Con	80
40 Exchequer	74
50 Enterprise	1½
20 Gould & Curry	12
30 Hale & Nor	15
30 Julia	4.80
60 Justice	4.45@4½
50 Mexican	37½
100 Newark	13c
20 Ophir	38½
20 Potosi	6½
30 Savage	15½
20 Sierra Nevada	47½
10 Union Con	73
20 Yellow Jacket	18

The Mining Share Market.

The election returns at the close of our last report seemed to affect the prices of stocks and produce a certain stagnation. The ability to control the water in the flooded mines sustained Comstock, although the market showed many signs of weakness, which were in a great measure dispelled by a stronger market, with a good demand for Comstock, a revival which was felt all along the line, and as we close our report the market is in a healthy condition, with a demand for stocks at advanced rates. The election of a conservative element to the Legislature has probably created more confidence than has been felt for the past year, and removed the fear of the destruction which threatened the mining stock business.

Bloody Canyon Mines.

We clip from the Mammoth City *Herald*, of a late date, the report of Superintendent A. Caldwell, on the mines of Bloody canyon, which is in itself an interesting sketch of this new district in Mono county. Mr. Caldwell says:

"I have made a close examination of the mines at the head of Bloody canyon on the east, and the headwaters of the Tuolumne river flowing westerly through the Yosemite valley. These mines are situated near the summit of the Sierras, on the westerly slope and 27 miles from Yosemite. They are without doubt on the mother vein of the Sierra Nevada mountains, the same mineral belt as Mammoth, North Fork, Prescott and Tioga. This mineral belt can be traced 50 miles and a continuous vein found. Its width of mineral belt will average one mile; its course is northwest by southeast and its pitch is easterly. At Mammoth the ores are free milling; gold is found one-third, silver two-thirds, and as you go north the metal runs into antimonial silver. This is the description of ores found in the mines of the headwaters of Tuolumne river. The outcrop commences at the head of Parker canyon, and follows the western slope of the mountains for a distance of six miles, and the vein can be traced the entire distance.

"At the Golden Crown the croppings show 200 feet in width. Ores from this mine assay as high as $300 per ton at a depth of three feet below the cap. The cap rock is iron rock, and below this comes the antimonial silver ore. Following locations have been made: Golden Crown, Gem, New York, Big Blue, Mount Dana, Kalamazoo, New Brunswick, Ella Blose, Liberty, Enright and Silver Gray. The mineral belt lies in granite on the west side, and the east side of a belt is a quartzite and porphyry. There is only one vein running through the country. The facilities for working these ores cannot be excelled; wood and water are in abundance at the base of the mountain. A natural road leads down to Yosemite valley. I predict that in one year these mines will employ thousands of miners, and another grand field will be opened to the attention of our capitalists.

"I see no better field for an enterprising mining man on this coast than in these mines. The returns are certain, but of course capital must be had to open them up. It is no place for poor men this fall. The mines are new, and it is impossible to get employment; but next year there will be a splendid field for labor. The climate is healthy, and the winters are not severe. Living will be within the reach of the laborer, as everything is convenient, and all freight will come by Yosemite valley."

DISTANCE AND THE ELECTRIC LIGHT.—The *Scientific American* in its last issue says: "On the evening of July 12th, the Maxim electric light was put in operation on the tower of the Grand Union Hotel, Saratoga Springs, N. Y., with a view to test the extent of its illuminating powers. An open paraholic reflector was used—no lenses. The light was turned toward a spot in Ballston Spa, New York, 7½ miles distant. So powerful was the light, so accurate the focusing and alignment, that the designated place in Ballston was instantly illuminated, so that ordinary print could be read, the time seen on watches, etc. The night was clear, still, and dark. The experiment was made at 9½ o'clock P. M."

DIMOND, the defaultiog ex-Treasurer of the Massachusetts Missionary Society, has been committed to prison at Boston in default of bail.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

ITEMS.—*Dispatch*, Sept. 6: The Tallaman mine has nearly finished sinking the extra hundred ft on which they have been engaged for some time past. The rock taken out from the bottom looks well, and the prospect of making this a successful mine is much brighter now than it ever has been before.

CALAVERAS.

GWIN MINE.—*Chronicle*, Sept. 6: The batteries are kept constantly employed, rock being mined from both the 1400 and 1500 levels. The new hoisting works, at the new shaft on the Alexander mine, are completed, and sinking has been commenced.

CLEAN-UP.—J. F. Veith, Esq., proprietor of the Mammoth hydraulic, finished cleaning up this week. We are not at liberty to give the figures, but the amount of gold realized was large. Mr Veith has made a very successful season, and, although the water has failed for the present, he will continue work putting the Mammoth in condition for active operations when rains come again.

EL DORADO

SACRAMENTO MINE.—*Republican*, Sept. 4: This mine is located about a mile and a half north of Shingle Springs and bids fair to be one of the richest in the county. The rock assays well; even at the surface a ton yielded $20. It is owned by Mr. Stewart, of Sacramento, who is already erecting a large furnace and works suitable for the mine. He proposes to work the mine by what is known as the Robertson process. This is considered a vast improvement on the old cumbrous mills and at a cost of $3 per ton, 90% of the fire assay can be obtained. An assay office will be erected near the furnace works and mining tests will be made at a cost of $1.50 per pound, $15 per ton.

ITEMS.—*Mountain Democrat*, Sept. 6: The Eagle mine at Grizzly Flat has a large and strong ledge, the prospecting of which gives promising results. A thorough development is to be made at once, capital having been secured for that purpose. The "Eagle" is on the same ledge as the celebrated "Mount Pleasant" mine. The Golden Gate mine is located upon the north bank of Canyon creek, near Jones' Hill village. There is a handsome five-stamp quartz mill on the mine. Tunnels and crosscuts have been run along the lode, which satisfy the owners that there are many years steady work yet ahead. The ore taken from the tunnel and crosscuts runs from $40 to $75 per ton. Georgia Slide is a permanent mining camp. The Beattie mine, owned by Barklage, Beattis, Gormsby and Thurston. This mine in character is bedrock, in places interspersed with quartz seams and stratas of porphyry. The mode of working is by running tunnels or powder drifts to be blown up, then, after breaking with hammers the large rocks by hydraulic process, the debris is washed through the flume. The result pays the owners handsomely, who have thus worked it since 1854. The mine is now worked to a depth of 150 ft. The Reinhart mine, owned by Jo. Reinhart and others, adjoining the Beattie, is worked in the same manner, and pays satisfactorily to the owners, who have worked it constantly since 1850. The Blue Rock mine adjoins Reinhart's, and is owned by the Flynn Bros. This mine is the same in character as the others, and pays with like satisfaction to its owners.

INYO.

MODOCK.—*Independent*, Sept. 6: South drift, 300 point, run 22 ft; north drift, 300 point, 15 ft; north drift, 800 point, 16 ft; north crosscut, 1100 point, 16 ft, and south drift, 1100 point, 16 ft. Total length of south drift, 300 point, 194 ft; north drift, 300 point, 105 ft; north drift, 800 point, 160 ft; north crosscut, 1000 point, 39 ft, and south drift, 1100 point, 160 ft. Have started a crosscut west from drift north, 300 point, and shall further explore the ore body. We have been running in on this drift. Have had ore from the first 18 ft to present face, 87 ft. North drift, 800 point, still presents the same appearance, carrying clay seam in face, and holding its course towards the ground we are running for. North crosscut 1000 and south drift 1100 point, continue to improve as we advance. Face of latter is in crystallized lime and manganese, looking favorable for ore.

INDEPENDENCE TUNNEL.—At a distance of some 50 ft from the mouth of this tunnel the miners have cut into a blind ledge containing some very fine looking ore, but, as yet, nothing is known of its extent. At a point 100 ft further it will cross the lowest ledge on this line having a surface outcrop, one of Superintendent Holt's original locations, the ore of which assays as high as $180 per ton.

MONO.

STANDARD.—Bodie *News*, Sept. 7: North drift, 385 level, is in 307 ft, the ledge in this drift is 3 ft wide of good ore. Have started a crosscut from this drift 358 ft north of the main east crosscut; the rock here is at present very hard. In the stopes the ledge continues to look well, and is from 8 to 15 ft wide of high-grade ore. The south drift, 050 level, is in from the winze 36 ft, the ledge being 4 ft wide and looking well. The top raise from this level has reached a hight of 130 ft; the ledge at this point is very wide of fair milling ore. The west crosscut, 300 level, is in 75 ft; formation continues very hard. The ledge in the West Standard stopes is about 10 ft wide of rich ore. In the stopes, 350 level, south drift from the ledge, is from 8 to 12 ft wide of good ore. The ledge in the Gildea stopes is 3½ ft wide, and is looking about the same as usual. The pumping engine is now in place. Work on machinery and buildings at the new shaft is nearly finished. The new boiler house, and car track to tramway, will be completed in a short time.

SOUTH NOONDAY.—Engaged in sinking a winze from the north drift, on the ledge, which continues to improve as distance is made. The vein is now 3 ft between walls and of a fine character of ore which will do to mill. The character of the ledge is a soft decomposed quartz and clay, resembling that found in the Noonday and other mines in the immediate vicinity. The tracing done on the surface at this mine has resulted in uncovering a fine and paying ledge, which will average from the grass roots 4 ft in width.

MARYLAND CON.—Main double compartment shaft down and timbered 160 ft, and will be completed to its lower level in about 15 days.

VORTEX.—Winze from the north drift, on the 200 level, has been advanced nine ft during the week; ledge in the bottom is two ft wide, of good ore.

UNIVERSITY.—New shaft down 105 ft, showing a formation of porphyry with heavy seams of quartz and clay. Indications are favorable to the discovery of a large ore body at an early date.

SOUTH BULWER.—Ledge on 350 level is 3 ft wide, showing a fair character of ore encased between good walls. North drift from the bottom of winze No. 2 has been advanced 10 ft, making a total of 29 ft; ledge 2½ ft wide of good milling ore. The west crosscut on the 420 level has been advanced 0 ft through very favorable formation, having passed through several fine strata of quartz.

WEST PACIFIC.—The ground very hard. Progress during the week 11 ft. The old portion of the shaft, about 35 ft, is to be retimbered, as it is not considered safe, although the lagging is quite sound. A small vein, prospecting well in gold, has been struck at the bottom of the shaft.

MONO.—*Chronicle*, Sept. 0: The joint crosscut has been run a total distance of 405 ft. A drift has been run south on the Boyd ledge a distance of 34 ft. A winze has been sunk on the above ledge 34 ft, and as depth is attained the ledge widens, showing good paying ore. Two large boilers have been added to furnish additional steam power.

BLACKHAWK.—The shaft is now down 28 ft below the 300 evel, and is going down at the rate of two ft a day. The bottom is entirely in vein formation. The winze on Warren vein is down 150 ft below 820 level. Crosscutting has commenced, east and west, to cut veins on both sides of the winze. Winze on west vein, near the west line of the claim, is down 55 ft below 320 level. Vein continues about 2 ft wide, regular and well defined between two solid walls. Average assays, $20, and improving as depth is attained. On our visit to the mine yesterday we found them putting on a new wire cable 700 ft in length.

TIOGA.—Shaft down 605 ft, in hard rock. Syndicate drift is in about 320 ft, in fair working ground. The lateral drift, south, on vein No. 3, 500 level, is in 75 ft, with a ledge in face of drift 3 ft wide of good milling ore. The north lateral drift in same vein is in 65 ft, with 2 ft of ore in face. Have started a vertical winze on 520 level to strike the No. 3 vein, which will occur at no great depth.

RED CLOUD.—Working on 250 level, and running two drifts. South drift, west crosscut in Red Cloud ledge, is in 18 ft, with 2 ft of fair ore.

CHAMPION.—Sinking winze on 400 level. It is now down 32 ft, in ore all the way, and which is widening out in the bottom. The south crosscut is in 62 ft, and also in ore all the way. Everything about this mine is running smoothly.

MAMMOTH.—*Lake Mining Review*, Sept. 0: The Bonanza tunnel is in 387 ft. Crosscut No. 3 has been advanced over 36 ft, the whole distance in fine ore. The ore vein becomes richer as work progresses.

MONTE CHRISTO.—A large quantity of fine milling ore is on the dump.

TRUE BLUE.—The face of the drift is in 140 ft, with stringers of quartz coming in. The ledge is 30 ft distant.

NAPA.

QUICKSILVER.—*Calistogian*: Mining business at Calistoga begins to look up a little as the weather gets cool. Francis will soon work his claim day and night; and it begins to look as if the Ida Easley might receive some attention again soon. Work on several other claims will commence at an early day. During the week ending with Tuesday, Sept. 24, the large amount of 41,732½ pounds of quicksilver were shipped from Calistoga to San Francisco.

ITEM.—*Register*, Sept. 0: About a year ago J. H. Francis, of Calistoga, commenced prospecting for gold and silver on his 140-acre mountain ranch above that town. Until lately, however, he has not pursued the work very energetically, but a month or two ago a man in his employ came down from the ranch and told him good quartz had been found, and Mr. F. immediately repaired to his claim, to find the report correct. He immediately set men to work, and has now quite an extensive tunnel in the mountain side. When in 30 ft some of the rock was sent to San Francisco, and an assay obtained that warranted a following up of the indications. This has been done and the rock improves in richness as the work progresses. Men are now at work on the tunnel continuously, day and night, and there are those who think Mr. F. is in a fair way to strike a bonanza. The claim is on the east side of the valley, one and a half miles above Calistoga.

PLACER.

ITEMS.—*Herald*, Sept. 0: The Heenan and Molin quartz mine, on Rock creek, now worked by E. W. Roberts, is reported as yielding some very excellent ore. Messrs. Breece & Wheeler have about completed their new track and other preparations for the winter's run on their claim at Bath. Their prospects are said to be good for a large yield of the "ore." Messrs. Clark, Hemsley & Beckett are also pushing work ahead on their tunnel, and are quite sanguine of success.

NEVADA.

WASHOE DISTRICT.

GOULD HILL *News*, Sept. 8: During the past week the main incline has been sunk and timbered 14 ft and is now 27 ft below the 2400 level. The material passed through and now showing in the face continues to be a favorable looking vein matter carrying streaks of clay and quartz. On the 2300 level the north drift has been advanced 35 ft, making the total length from the main east drift 253 ft, passing through bird's-eye porphyry with clay streaks. The east crosscut from the end of the main east drift is now in 19 ft, showing a favorable vein porphyry. The north drift on the Hardy vein has been advanced 20 ft, and is now 45 ft north of west crosscut No. 1; still showing low grade ore. On our 2000 level the joint Mexican crosscut on our north line has been extended 24 ft; total length, 108 ft. The material passed through continues a vein formation, showing more quartz than at date of last report. The stopes are yielding good ore.

UNION CON.—The joint Mexican crosscut on our north line has been extended 8 ft; total length, 80 ft. The material passed through continues to be a soft matter, showing streaks of quartz and clay. Work has been resumed in the raise from our 2300 level (2200 of Sierra Nevada), designed to connect with the Union shaft. It is now up 40 ft above that level, which leaves 74 ft to go before making the connection with the shaft.

CON. VIRGINIA.—During the past week 1,215 tons of ore have been extracted. On our 850 level in the joint California west crosscut we penetrated beyond the drift with the diamond drill 42 ft and struck clay, through which we could not pass. The drill has been taken out and drifting resumed in the face of the drift. The south lateral drift is now in 20 ft, passing through a vein formation showing streaks of clay. On the 1050 level we have started an uprais at a point 50 ft east of No. 2 winze, which will explore the country east of the ore stopes. On the 2150 level the east crosscut has been extended 29 ft—total length 196 ft—and continues in a favorable formation.

CALIFORNIA.—During the past week 981 tons of ore have been extracted. On our 850 level, in the joint Con. Virginia crosscut west, we penetrated beyond the face of the drift with the diamond drill a distance of 42 ft and struck clay, through which we could not pass. The drill has been taken out and drifting resumed in the face of the drift.

MEXICAN.—On our 2100 level the joint Ophir west crosscut has been extended 24 ft, and is now in 108 ft from the main north drift, passing through a vein formation showing more quartz than at date of last report. The joint Union Con. winze on our north line has been sunk and timbered 16 ft; total depth, 52 ft; showing a soft vein formation in the bottom, and carrying sufficient water to interfere with our progress in sinking.

SAVAGE.—The 2200 lateral drift, connecting with the Hale & Norcross, has been entirely drained from water excepting the northern portion near our incline, carrying the incoming flood of water which covers the bottom of the drift a few inches. The water stands in our station about three ft, the drift being considerably higher than the station. We cannot enter the station or lower our pump any further, owing to the excessive heat and the gas escaping from the incline. The temperature taken this morning at the coolest point at the pumps is 140° Fahrenheit.

CON. IMPERIAL.—The joint winze being sunk on Alpha-Imperial line from the 2000 to the 2135 level has been advanced 21 ft, making total depth of same to date 72 ft. Upraise started during past week from 2135 level has been extended 12 feet. There have been started two crosscuts on 2600 level, one on the Alpha-Imperial line, and the other about 200 ft south of said line, each having been advanced to date a distance of 10 feet.

UNION SHAFT.—During the week we have sunk and timbered our shaft 32 ft, making a depth of 80 ft below the Sierra Nevada 2000 level. The raise from the Sierra Nevada 2200 level, designed to connect with our shaft, is now up 40 ft, leaving 74 ft yet to raise before making a connection, which distance we expect to accomplish by the 25th inst. On the 1600 level the west drift to connect with the Union Con. east drift has been extended 23 ft, making a total length of 113 ft, passing through hard, blasting porphyry.

SIERRA NEVADA.—Very good progress has been made in the upraise from our 2200 level to connect the Union shaft with this level. This work will very materially aid the sinking of the Union shaft. When this shaft is completed to this level the cost of handling the water in the Sierra Nevada incline will be very much reduced.

GOULD & CURRY.—During the week ending yesterday the 1700 joint east crosscut was advanced 30 ft; total length of drift 1,217 ft. The G. & C. and B. & B. joint shaft was sunk and timbered 15 ft; total depth to date, 730 ft. Machinery for the new pump hoist is arriving on the ground and will be set up together with the pumping engine, as soon as the foundations are completed, which will be some time during the present week.

NORTH BONANZA AND FLOWERY.—The water struck a few days ago in the bottom of the shaft is gradually diminishing, but not sufficiently, however, to resume sinking. The ledge in the 400 has not been cut yet, notwithstanding we have expected to do so every day the past week. The crosscuts on the 300 of the Flowery are showing better; also, one of the exploring drifts going north from this crosscut. In the North Bonanza 300 crosscut No. 1 the ore is showing much better than at last report.

TROJAN.—West drift, third station, has been advanced and timbered 5 ft. At a point 65 ft in on west drift drifted south 23 ft through quartz and porphyry, quartz giving low assays. Thirty-seven ft have been added to working above second station, passing through quartz and porphyry, quartz giving fair assays.

SILVER HILL.—This past week our 1300 crosscut has been extended east 58 ft; whole distance from incline, 282 ft. Face is in porphyry, mixed with streaks of low-grade quartz; very little water.

BULLION.—The north drift on the 2400 level has been advanced during the past week 28 ft in Bullion ground, through material about the same as that mentioned in my last report. The incline winze has been sunk 14 ft, making its total depth 111 ft. The material penetrated is hard, vein matter.

ARGENTA DISTRICT.

ITEM.—Tybo *Sun*: We learn from a private letter that the Oliver Twist mine in the above district is looking well. The returns from the assayed shows gold, $41, and silver $847, total $888. About next month they will ship some ore here to the Tybo Con. for reduction. The New Philadelphia company mine, Bismarck, is opening out well and has yielded a good lot of ore now on the dump.

BELMONT DISTRICT.

ITEMS.—*Courier:* The Belmont mine is looking very well. About 500 tons of good milling ore have been taken out. The Alexander mine is proving to be one of the very best in Nye county, and the bullion output is regular. As the mine is opened up it shows constant improvement, both in quantity and quality of ore.

EUREKA DISTRICT.

EUREKA CON.—*Sentinel*, Sept. 2: The ore bodies are showing considerable strength. The surface shaft is down 105 feet in hard limestone. Indications of ore in the west clifts of 13th and 14th levels.

PARADISE DISTRICT.

RATTLER MINE.—*Silver State*, Sept. 4: This mine is now producing, with a small force of men, about two tons of ore per day. Last month the ore sampled $54 per ton. The ore as now taken from the mine assays, from battery samples, from $178 to $200 per ton.

BULLION OF PARADISE.—This company has struck the ledge through the tunnel. Crosscut now in 13½ ft. The quartz shows silver thoroughly mixed in a number of varieties—black sulphurets, ruby and chlorides predominating. A specimen taken from the lowest depth—about 100 ft—this afternoon, will assay into the thousands. The ore from this mine works easily by the wet process from 75 to 78%, proving it a very free milling ore and much more economically worked than if it required roasting.

PARADISE MINE.—Never looked so prosperous as now. About 80 men are working in all departments.

ITEM.—*Silver State*, Sept. 3: General Clarke received a note from Paradise to-day informing him that the lower tunnel on the Bullion of Paradise mine tapped the ledge on Monday and has since been run into it 13½ feet without striking the hanging wall. The ore is very rich and the strike is the most important yet made in the mine.

PIOCHE DISTRICT.

ITEMS.—Eureka *Sentinel*, Sept. 3: We hear that a vein of ore, 12 ft in width, has been discovered in the neighborhood of Wilson's ranch, by Mr. Woods and his partner. The Midnight mine, the ownership of which was lately decided in the District Court, belonging to Sol. Brishacher and others, will immediately be opened up, a force of men having already been sent out to the mine for that purpose. Work has also been commenced on some other claims in that district by McDonald & Webster.

RUBY HILL DISTRICT.

ITEM.—Eureka *Sentinel*, Sept. 5: Four men at the Connor mine get out 100 tons of ore per month at present rate of working.

WILLOW CREEK DISTRICT.

ETHAN ALLEN.—Eureka *Sentinel*, Sept. 5: T. J. Harlan, assayer at Paradise Valley, who recently visited the Ethan Allen mine, on Willow Creek, reports it to be one of the largest ledges ever discovered in the country. It is located on Willow creek, where there is plenty of fuel and water for reduction works, six or seven miles from the Ohio mine. The ledge crops out about 100 feet wide on the surface, and is prospected by a tunnel which has been run 30 feet into the ledge, showing ore all the way. The ore assays from $30 to $900 in silver per ton, the average being considerably over $100.

WHITE PINE DISTRICT.

ITEM.—Bodie *News*, Sept. 5: The latest from Osceola is to the effect that 41 tons of ore from the Monroe & Linton, taken as it comes, worked $30 to the ton, and 26 tons of ore from the Crescent, one of the Eagle mining company's mines, worked $15 to the ton. This, for gold ore, is not to be despised, even in a good mill, but when extracted by means of an excuse for one, might be called extraordinary.

ARIZONA.

ITEMS.—Tucson *Star*, Sept. 4: News from Gro Blanco says that a fine body of ore has been struck in the Idabo, one of the Flood & Kirkpatrick mines. We learn from Mr. Geo. Hoag, superintendent of the Ostrich mill, that prospects in Oro Blanco district were never more encouraging than at present. Preparations are being made by several companies to put large forces to developing some of the rich properties of the district. Already some of them have begun. He says that not less than 150 men will be turning out ore before the end of the month. From every mining district in the country we have the most encouraging news. From north, south, east and west we hear of new finds, rich developments and good sales. Dos Cabezas, Swisshelm, Dragoon, Tombstone, Huachuca, Whetstone, Patagonia, Davis Canyon, Cahabi, Arivaca, Oro Blanco, Montezuma, Papago, Santa Catarina, San Pedro and other districts in the country are marching right on.

YAVAPAI CO.—*Arizonian*, Sept. 0: The Tiger and Tip Top mills are running and paying. It is thought that the Peck mill will shortly start up. Masterson's Turkey Creek mill is, we learn, running on good ore. Messrs. Gosper & Lount have the machinery for their mill on the ground. Several arastras are running; one on Lynx creek was recently cleaned up, when the result, in gold, from two tons of rock pleased all who saw it. Mr. Earp is sinking on what promises to be a good gold and silver-bearing lode, a few miles west of Prescott. Rock from it may be seen at this office. Robert Connell and David Grubb are delighted with results of recent assays of rock from their "Pine Tree" lode, in Hassayampa district. We are not at liberty to give figures. The Pine Tree is near the head of Maple Gulch, in the midst of a fine body of timber. The mine affords abundance of water to run a mill.

MOHAVE CO.—Letters from gentlemen of Mineral Park, county seat of Mohave, give good news. Mr. Hardy has placed a force of men on the Fairfield mine. The Keystone miners are taking out a great deal of fine ore. The five-stamp mill at Cerbat started on the 22d inst. Mr. Barry has charge, and is working ore from the "63" mine. The mill in Cedar Valley district is said to be running. Another report is that the Signal mill is also at work.

[CONTINUED ON PAGE 172.]

How Our Ancestors in the Stone Age Made Their Implements.

[Read before the California Academy of Sciences, August 4th, by Hon. B. B. Redding.]

Flint, obsidian, chert and other hard stones having a conchoidal fracture, manufactured into forms to be used as axes, chisels, knives, scrapers, spear and arrow-heads, are found in nearly all parts of the world. They are almost the only remains of a race of people who inhabited the earth at a period so remote that they were cotemporaneous with the wooly elephant, the cave bear, the Irish elk, and other animals now extinct. These implements are often found in connection with the remains of these and other fossil animals. In one instance, in Denmark, a stone arrow-head was found imbedded in the bone of a deer, the whole family of which has been so long extinct that they are only now known from their fossil remains. The people who made these stone implements lived in Palestine ages before Tubal Cain, and in Egypt long before the first Pharoah. Their flint knives, axes and arrow-heads have been found in Europe from Greece to Norway, and from France to the Steppes of Russia. In Asia, from India and the Malay Archipellago to Japan and Kamtchatka. In America, from Greenland and Alaska south through the United States, the West Indies, the valley of the Amazon, and Peru to Terra del Fuego. They seem to prove that man was originally a savage; that he lived by fishing and the chase, and that civilization is the result of a long, slow and tedious process of evolution.

There is great similarity in these stone weapons and implements wherever found throughout the world. A spear-head or scraper, an arrow-head or celt from England could not, by its shape or peculiarity of manufacture, be distinguished from similar instruments found in Denmark, Palestine, Japan, or South America. The stones used might differ, but the mode of manufacture and general shape are nearly always the same. How our pre-historic ancestors could have made these stone implements ages before the discovery of the use of bronze or iron has been the subject of many speculations among archæologists, and many theories have been advanced in support of these speculations. The general conclusion has been that they were chipped into the shapes we find them by blows from small stone hammers. It is, however, proper to state that Mr. John Evans, Sir John Lubbock, Mr. A. Morlott and other writers on pre-historic remains, have suggested that the observations of travelers as to the modes pursued by savage nations in similar work might afford a correct solution.

The theory that they were manufactured into the shapes we find them by blows from stone hammers was generally received until after the publication, in the *Overland Monthly*, of the observations of Mr. E. G. Waite, and the late B. P. Avery, and in the Smithsonian reports of a letter of General George Crook, all of whom had had an opportunity to observe Pacific Coast Indians manufacture stone implements, and chip them into perfect shapes without the aid of stone hammers. As, however, these Indians used iron or steel in their work, obtained from white men, it was thought they might have changed the processes pursued by their ancestors. From a late newspaper paragraph I see that Mr. F. H. Cushing, who is connected with the Smithsonian Institute, by independent observation, has arrived at the conclusion that the stone implements were not chipped into shapes by blows, but that the small flakes were broken out by pressure, and that to prove his theory, he made a flint chisel, chipping it into shape by pressure with the aid only of a piece of hard wood.

Having had an opportunity to see a stone arrow-head made by a man, practically still living in the Stone Age, without the aid of any implement other than those found in a state of nature about him, and taking notes at the time of each act of manipulation and every process, I have thought a record of what I saw, added to those made by other observers, might have some value in determining the processes used in similar work by our remote savage ancestors.

Prior to the close of the Modoc war the Wintoons, or McCloud River Indians, were without firearms. Up to that time the few settlers who reside about the base of Mount Shasta made it a rule to permit no Wintoon to carry a gun. As there are no agricultural lands and no mines on the McCloud river, the Wintoons were left in almost undisputed possession of their prolific hunting grounds and to the inexhaustible supply of salmon and trout with which that river abounds. The Wintoons had but little contact with Americans until after Mr. Livingston Stone established a station on the river for the taking of salmon eggs for distribution by the United States government. Very few of these Indians as yet have guns; their principal reliance in the chase being upon their primitive but powerful bow and arrows. The arrow-maker is still a man of great importance in the tribe.

While visiting the United States fishery a few days since I expressed a wish to Deputy U. S. Fish Commissioner Livingston Stone, who has acquired a knowledge of the Wintoon language, that one of the best arrow-head makers of the tribe should make in my presence a stone arrow-head, using only such tools and implements for the purpose as were in use by the Indians before their contact with white men. These people are only now emerging from the Stone Age, and a record of their manufacture of stone implements may give an illustration of the methods pursued by our ancestors in the Paleolithic Age, 10 or 12 or more thousands of years ago, when they lived upon the products of the chase of the fossil deer, the aurochs and the cave bear.

Promptly at 3 o'clock came Consolulu, an old man between 68 and 72, grey haired, but erect and vigorous. He had been for many years chief of the tribe, and was elected chief when a young man because alone and unaided he had killed a grizzly bear with his bow. He brought, tied in a deer skin, a piece of obsidian weighing about a pound; a fragment of deer-horn split from a prong lengthwise, about four inches in length and half an inch in diameter, and ground off squarely at the ends, this left each end a semi-circle; two deer prongs (*Cariacus Columbianus*) with the points ground down into the shape of a square sharp-pointed file, one of these being much smaller than the other. He had also some pieces of iron wire tied to wooden handles, and ground into the same shapes These he said he used in preference to the deer prongs, since the white men came to the country, because they were harder and did not require sharpening so frequently. When asked where he obtained the obsidian, he answered from a place on the north side of Mount Shasta —about 60 miles distant; that, in former days, the land where it is found was claimed by the Yreka Indians, and as this stone was wanted by the Trinity Indians, the Yrekas and the Modocs, as well as the Wintoons, it was rarely obtained without a battle. The piece he had was a light blue in color, and he valued it at $20; he stated that if it were white it would be worth $40 or $50. I could not learn that white obsidian is harder, or is worked with greater ease. Its increased value is probably based on its greater rarity. After stating that in battle he had been twice wounded with arrows, once in the shoulder and once through the calf of the right leg, and showing the scars above the ankle where the arrow had passed through, missing the bone, and been drawn out at the other side, and further stating, with evident gratification at the recollection, that while the arrow was still in his leg, he sent one of his own into the throat of his opponent, from the wound of which he had bled to death in a few minutes—he commenced the operation of making a stone arrow-head. Holding the piece of obsidian in the hollow of his left hand, he placed between the first and second fingers of the same hand the split piece of deer horn first described, the straight edge of the split deer horn resting against about a fourth of an inch of the edge of the obsidian, this being about the thickness of the flake he desired to split off. Then, with a small round water-worn stone, which he had selected, weighing, perhaps, a pound, he with his right hand struck the other end of the split deer horn a sharp blow. The first attempt resulted in failure. A flake was split off, but the blow also shattered the flake at the same time into small fragments. He then repeated the operation, apparently holding the split deer-horn more carefully and firmly against the edge of the large piece of obsidian. The next blow was successful. A perfect flake was obtained, showing the conchoidal fracture peculiar to obsidian. This I purchased, and instructed him to split off another from which to make the arrow-head. He repeated the operation, and was again successful, and I have no doubt he could, with only an occasional failure, have split up the whole piece in a few minutes into shapes for spear-heads, knives and scrapers. The shape naturally taken by the obsidian when split off in this manner is that of a spear-head, and it could be put to use for this purpose with but slight alteration. The thickness of the flake to be split off depends upon the nearness or distance from the edge of the obsidian on which the straight edge of the split deer-horn is held at the time the blow is struck.

The flake having been obtained, I watched with much interest and attention the process of working it into an arrow-head. He now squatted on the ground, sitting on his left foot, his right leg extended in a position often assumed by tailors at work. He then placed in the palm of his left hand a piece of thick, well-tanned buckskin, evidently made from the skin of the neck of a deer. It was thick, but soft and pliable. On this he laid the cake of obsidian, which he held firmly in its place by the first three fingers of the same hand. He then rested the elbow on the left knee, which gave the left arm and hand holding the flake firm and steady support. He then took in his right hand the larger of the two deer prongs—which, as has been stated, had its point sharpened in the form of a square file—and holding it as an engraver of wood holds his cutting instrument, he commenced reducing one edge of the circular form of the flake to a straight line. With the thumb of the right hand resting on the edge of the left palm as a fulcrum, the point of the deer prong would be made to rest on about an eighth of an inch or less of the edge of the flake, then with a firm downward pressure of the point a conchoidal fragment would be broken out almost always of the size desired. The point of the deer prong would then be advanced a short distance, and the same operation repeated until in a few minutes the flake was reduced to a straight line on one edge. As this operation broke all the chips from the under side of the flake, if left in this condition, the arrow-head would be unequally proportioned, that is, the two cutting edges would not be in the center. He, therefore, with the side of the deer-horn, firmly rubbed back and forth the straight edge he had made on the flake until the sharp edge had been broken and worn down. The flake was now turned end for end in the palm of his hand, and the chipping renewed. When completed, an equal amount was taken from each side of the edge of the flake, and the cutting edge was left in the center. It was now plain that the straight edge thus made was to be one side of the long isosceles triangle, the form of the arrow-heads which is used by his tribe.

With the flake of obsidian firmly held in the cushion of the left palm, and the point of deer-horn strongly pressed on the edge of the flake, the effect was the same as the blow which split the flake from the larger piece. While, however, he was not always sure of the effect of the blow in splitting off the larger flakes out of which to make the arrow-heads, he in no instance appeared to fail in breaking out with the point of deer prong the exact piece desired. The soft, thick, pliable piece of tanned deer-skin on which the flake in his left palm was held may have added to the cushion, but seemed to serve no other purpose than save his hand from being cut by the countless sharp chips as they were broken off. One of the long sides of the arrow-head having been thus formed, the flake was turned over and the other side formed in the same manner. As, however, very much more of the obsidian had to be chipped away he brought more pressure upon the point of deer horn and broke out larger chips until the flake began to assume the shape desired, when the same care was exercised as when the first straight edge was made. In breaking out large or small chips the process was always the same. The pressure of the point of the deer-horn on the upper edge of the flake never appeared to break out a piece, which on the upper side reached beyond where the point rested, while on the under side, the chips broken out might leave a space of twice the distance. Invariably, when a line of these chips had been broken out, the sharp edge was rubbed down, the flake turned end for end, and the chipping renewed on the other side. By this process the cutting edges of the arrow-head were kept in the same line. The base was formed in the same manner. No lines were drawn, but he would occasionally look at his work as it progressed and chip on one side or the other to keep their proportions equal. The base of the arrow-head, opposite the point, when finished, is inserted in a slot made in the end of the wooden shaft, and is firmly tied by deer sinew. To hold the arrow-head firmly to the shaft, and to prevent the thread from interfering with the penetrating power of the arrow, a slot about one-fourth of an inch deep is chipped into both cutting edges of the arrow-head, about one-fourth of an inch above the base. This causes the arrow to look as if it were barbed, but the object seems only to be to provide means by which the arrow-head may be firmly fastened to the shaft, at the same time avoiding the making of any obstruction to the penetrating or cutting power of the arrow-head. The chipping out of these slots was the last operation to be performed. It seemed to be more difficult than any other part of the work, and I thought in this would be the danger of the loss of all the patient labor that had been expended. In practical operation it was the simplest, safest and most rapid of all his work. He now held the point of the well-shaped arrow-head between the thumb and first finger of his left hand, with the edge of the arrow-head upwards, the base resting edgewise on the deer-skin cushion in the palm. He then used the smaller deer prong, which had been sharpened in the same form as the larger one, but all its proportions in every respect were very much smaller. Its point could not have been larger than 1-16th of an inch square. He rested this point on the edge of the arrow-head where he desired to make the slot and commenced sawing back and forth with a rocking motion, the fine chips flew from each side, the point of deer-horn descended, and in less than a minute the slot was cut. The arrow-head was turned over and the same operation repeated on the other edge. It seemed that, by this process, if he so desired, the arrow-head could have been cut in two in a very few minutes. He now examined his work in the strong sun light, and, being satisfied, handed to me the completed arrow-head. It had taken him 40 minutes to split the two flakes from the larger piece of obsidian and chip one of them into the arrow-head. A younger man, equally expert, would probably have done the work in half an hour. When I came to the purchase of the arrow-head and flake, I found they would cost 75c, payable in shells,—*dentalium entalis*,—which he estimated more highly than their value in money. The worth of the flake and arrow-head was not based on the time or labor employed, but upon the value of the obsidian, as he offered for a dollar's worth of shells to give me 10 arrow-heads of the same shape and size made from the bottoms of glass ale bottles.

The celts knives, chisels and scrapers of the Stone Age are all much simpler and more easy of manufacture than these semi-barbed arrow-heads.

I doubt if stone hammers were used in their manufacture other than to split off the flakes from a large piece of flint or obsidian, and when thus used the blow was communicated through the split deer-horn or a piece of hard wood in the manner I have described. The blow from a stone hammer direct on the flint or obsidian would be very uncertain in its results, even in the most skillful and practiced hands. With the split deer-horn the thickness of the flake and probable length could be determined with tolerable accuracy. Probably large chips could be broken from the edge of a flake by a slot in the end of a deer's horn, as is now practiced by the natives of Alaska with a walrus tusk, used as I have seen window glass broken with a key; but an arrow-head is too small and delicate for either operation.

I cannot but believe our pre-historic ancestors in the Stone Age used the same processes as were followed by Consolulu; and that, in describing what he did, I have told how the first ancestor of

> "The ancient arrow maker,
> Made his arrow-heads of sandstone,
> Arrow-heads of chalcedony,
> Arrow-heads of flint and jasper,
> Smooth and sharpened at the edges,
> Hard and polished, keen and costly."

Victoria Regina.

[Written for the Press by Jeanne C. Carr.]

The credit of the discovery of the queen lily is accorded to Doctor, afterward Sir Robert Schomburgk, the elder brother of a very remarkable family of naturalists. He commenced his career as modestly as our poet naturalist, Muir, and spent some years in business before receiving his call to explore and to write. He was a tobacco planter and manufacturer in Virginia, where he failed, went to the West Indies, and was employed in botanical and geographical explorations until 1840, when the English Geographical Society sent him to make certain surveys of the boundaries between British Guiana and Brazil. Schomburgk found the great lily in the river Berbice, in English Guiana, and gave it its royal name, which has been corrupted in consequence of misprint to the present form, "regia."

Several years earlier, D'Orbigny, a French naturalist, who, if I am not mistaken, was a member of the Academy, and died not many years ago in Paris, found the mammoth fleets of the leaves in the Parana and mentioned the discovery in his letters home. The wife of D'Orbigny visited California in 1870.

But the original discoverer of the marvelous plant was Hæncke, a German traveler, who found it in the year 1801, in the river Mamore, one of the great affluents of the Amazon. He said the vision caused him such a transport of delight and admiration that he "fell upon his knees and expressed aloud his thanks to God for this manifestation of the power and magnificence of his works." I repeat this pleasant story on the authority of a brother of Sir Robert Schomburgk, who is the curator of the Royal Botanic garden of Adelaide, South Australia.

Hæncke having died before the birth of the royal lady for whose advent the great lily and Dr. Schomburgk were waiting, it lay hidden in the inhospitable, yet magnificent solitudes which it adorns until 1841, when its seeds and dried specimens of leaf and flower were sent to England as a christening present, perhaps, to the baby princess soon to become Empress of Germany. The seeds were planted in the noble conservatory at Chatsworth, watched over by Sir Joseph Paxton; artists and botanists vied with each other in making it famous; the finder was made a knight for his pains; no one can say that the welcome it received was not worthy of its rank in the floral world. A mammoth colored atlas of the Victoria regia, which Col. Warren and possibly others in San Francisco possess, furnishes the best pictorial representation of the entire plant. There is also a large folded plate in one of the volumes of the *Botanical Magazine*, which is to be found in the library of the Mechanics' Institute. It first blossomed in the United States in the conservatory of Caleb Cope, in Philadelphia, in 1852, when hundreds visited it. It has since flowered in many other places, and its cultivation is not more difficult than many another "water bean," for such it is after all.

When I shut my eyes, and think how those still, dark water pastures must look, with the great leaves, the pure buds, the snowy blossoms just opened, the rosy masses of fading bloom, I am in sympathy with the rapture of Hæncke, oppressed with the wealth of nature with no one but God to speak to in those vast solitudes. Sometimes I think, how long the Lord and the lily had waited for the eye to see and the heart to feel this beauty. I remember, too, another lily bloom, which Audubon found and described in his lonely wanderings among southern lakes and lagoons, the yellow Nymphæa, which has lately been rediscovered and credited to him. This rare lily has bloomed in the garden of Jackson Lewis at San Jose. I wonder what manner of lilies Audubon and Hæncke perchance are gathering beyond the river of death; and so I leave this web of fact and of fancy to be finished by my reader, who, having seen the Victoria regia blooming in the Park conservatory, will be unwilling to rest without knowing more of it and of all the lotus-blooms, which the wisest of ancient peoples chose to symbolize things sacred and eternal.

Sacramento, Aug. 25th, 1879.

Success of Electric Light.—The English Parliamentary Committee's report on electric lighting says, that sufficient progress has been made to encourage the belief that electricity has a future for illuminating and as a source of mechanical power.

THE ENGINEER.

Atmospheric System for Working Mines.

The *Annales des Mines* describes a radically new mode of lifting minerals and maintaining a sufficent ventilation in the workings of deep mines, which has been lately introduced in the Hottinguer shaft of the Epinac collieries (Saone et Loire).

This shaft now exceeds 1,968 feet in depth, and will be sunk to 3,279 feet.

The coal trams, to the number of nine, are placed one above the other in a cage, which is provided at each end with a piston, working in a large tube reaching the whole depth of the shaft. The cage is raised or lowered by creating a partial vacuum or a plenum above the piston by means of a powerful air-pump. The arrangement consists of either a single tube, in which a cage alternately rises and descends, or of two tubes, coupled together, in one of which a train of empty trams descends while a full tram is being raised in the other. When two tubes are used the air pumped from that in which the full train is being lifted is delivered into the other, in which the empty train is descending, and in which there is already a partial vacuum, instead of into the atmosphere, and the weights of the trains thus balance each other, the net load of coal only having to be raised by the engine.

The air of the mine, which fills the lower part of the tube as the train rises, is blown out to the surface through an escape pipe as it descends, and the ventilation is thus to some extent assisted.

The tube used in the Hottinguer shaft is single, 5 feet 3 inches in diameter, of wrought iron, about 5·16 inches thick. It is in lengths of 4 feet 3 inches, bolted together, the joints being made with rings of caoutchouc a quarter of an inch thick. The heads of the rivets are countersunk on the inner side.

The sections of the tube carrying the doors and other fittings are in cast iron. At each loading and discharging place, or station, there are three doors in the tube, one above the other, spaced the hight of three trams apart; so that when the cage is in one position the first, fourth and seventh trams are opposite to the doors; when it is lowered through the hight of a tram, the second, fifth and eighth come opposite to the doors, and so on.

The cage is retained in any position by stops worked from the outside, and is readily lowered or raised at the stations, to bring any trams opposite to the doors, by admitting air over it, or by opening a communication between the tube above it and the exhausting engine. The cage is stopped without shock, at the ends of its travel by the cushion of air in the closed ends of the tube; and to admit of stopping at intermediate levels, as well as to guard against accidents, a sliding partition is fitted in the tube immediately below each station, except that at the bottom, which is open so long as the cage is below, but is closed when it has passed. The position of the cage, with its pistons, during the ascent or descent, is indicated in the engine-house by a series of barometers showing the pressure of air in the tube at points 100 meters (109 yards) apart. As the pressure below the cage is equal to that of the atmosphere, while a partial vacuum is maintained above it, the barometers show at once whether the cage is above or below the point at which each of them is connected to the tube.

To allow the pistons attached to the cage to fit the tube, even where this is not cylindrical, as at the doors, one of them, that above it, is made double, consisting of two pistons spaced at a distance apart greater than the hight of a door, but less than the length of tube between two doors. The pistons are packed with leather, and the tube is lubricated with water mixed with a little soap and oil.

The weight of the tube, 603.30 meters (659 yards) high, now in use, is 345 tons. It was completed in July, 1876, and has been worked regularly ever since. It is served, provisionally, by two pumping cylinders, 5 feet 3 inches in diameter by 2-foot stroke, driven by gearing from the winding engine formerly in use. With this pumping power, the trains lifted are each of 6 tons gross weight, carrying 3 tons of coal. The vacuum maintained in the tube is equal to a column of 9.4 to 9.8 inches of mercury; the speed of the train is 19½ inches per second; the friction is scarcely perceptible; and the leakage of air past the pistons does not exceed 14 to 17 cubic feet per second.

The work done in lifting the coal is 28% of the indicated power of the engine, while with the same engine, when winding up by a rope, it did not exceed 16%.

Large engines, of 730-horse power, are being constructed to work the tube, and with these a train of a gross weight of 9½ tons, carrying 4½ tons of coal, will be brought up at each lift. It is estimated that the consumption of coal for the boilers of the winding engine, in lifting from a depth of 1,000 meters (1093.6 yards), would be 10% of the quantity raised if ropes were used, but will be only 3% by the pneumatic system, even with a single tube. This is a saving of 145 pounds of coal per ton of coal lifted, equal to 6.6 pence per ton, valuing the coal used for the boilers at 8 shillings per ton. With an output of 450 tons per day, and reckoning 280 working days in the year, this is equal to an economy of £3,528 per year, in boiler coal alone.

USEFUL INFORMATION.

Lime and Hydraulic Cement.

From various authorities, among which may be named, Vicat, Burns, Haswell and Gen. Gilmore, the following statement of the characteristics of various kinds and qualities of lime and cement has been compiled:

1. The rich limes are the purest metallic oxide of calcium we possess, and the purer the carbonate of lime from which they are obtained, the more distinctly marked are appearances from which they derive their name. These are that they augment in volume to twice their original bulk, or even more, when slaked in the usual manner, and that they will not set (harden) under water if not mixed with any other mineral material, even though left immersed for years.

2. The poor limes are those which do not augment in bulk at all or only to a trifling degree, when slaked. They do not set under water any more than the rich limes.

3. The moderately hydraulic limes set under water in from 15 to 20 days, but do not become very hard. The change of bulk they undergo in slaking is the same as that of the poor limes, but never equal to that of the richer varieties.

4. The hydraulic limes set in from six to eight days' immersion, and continue to harden for some months.

5. The eminently hydraulic limes set within three or four days, and become quite hard in a month.

A classification of rocks with reference to chemical examination is as follows:

1. Pure calcareous rocks, or those containing from 1% to 6% of silex alumina (common clay), magnesia, iron, etc., either separately or in combination, give rich limes upon being calcined.

2. The limestones containing soluble silica in the state of sand, magnesia, the oxides of iron and of manganese, in various respective quantities, but limited to between 15% and 30% of the whole mass, yield poor limes.

3. The limestones containing silica in combination with alumina, magnesia and traces of the oxides of iron and manganese, in various respective proportions, but within the limits of from 8% to 10% of the whole mass, yield moderately hydraulic limes.

4. When the above ingredients are present in the proportions of from 15% to 18%, but the silica in its soluble form always predominating, the limestones yield a hydraulic lime.

5. When the limestones contain more than 20%, and up to 30% of the above ingredients, but with the soluble silica in the proportion of at least one-half of them, the limestones yield eminently hydraulic limes.

The experiments upon which the above conclusions are based appear to show that limes owe their hydraulicity, or power of setting under water, to the presence of a certain quantity of clay, and sometimes, but rarely, to the presence of a certain quantity of pure, soluble silica; and upon that principle a large proportion of our hydraulic cement, or water lime, is manufactured by mixing common fresh burnt lime with burnt clay and grinding them together, generally in the proportions of 20 parts of clay to 30 parts of very rich lime, but the proportions vary with the qualities of limestones and clays found in different localities.

WOOD STAINS.—To turn oak black so as to cause it to resemble ebony, the wood should be immersed for 48 hours in a hot saturated solution of alum, and then brushed over several times with a logwood decoction, prepared as follows: Boil one part of best logwood with 10 parts of water, filter through linen, and evaporate at a gentle heat until the volume is reduced one-half. To every quart of this add from 10 to 15 drops of a saturated solution of indigo, completely neutral. After applying this dye to the wood, rub the latter with a saturated and filtered solution of verdigris in hot concentrated acetic acid, and repeat the operation until a black of the desired intensity is obtained. To imitate rosewood a concentrated solution of hypermanganate of potassa is spread on the surface of the wood, and allowed to act until the desired shade is obtained. Five minutes suffice ordinarily to give a deep color. A few trials will indicate the proper proportions. The hypermanganate of potassa is decomposed by the vegetable fibers with the precipitation of brown peroxide of manganese, which the influence of the potassa, at the same time set free, fixes in a durable manner on the fibers. When the action is terminated, the wood is carefully washed with water, dried, and then oiled and polished in the usual manner. The effect produced by this process on several woods is remarkable. On the cherry, especially, it gives a beautiful red color.—*Scientific American.*

TRANSPARENCY OF METALS.—With the aid of electricity films of several metals of such minute thickness as to allow the light to pass through them can be produced. An electric current is passed into a wire of one of the metals, that extends into a glass tube containing rarefied air or gases. The particles of metal that the electric current loosens from the wire are deposited on the sides of the tube and form a transparent film. The light that passed through gold was a very handsome green, silver produced blue, copper, light green, platina, bluish gray, zinc, dark bluish gray, and iron, brown.—*Chemiker Zeitung.*

A NEW MATERIAL.—An invention lately brought out in England, consists in mixing the dust of coal with an extract obtained from boiling ordinary seaweed or other similar vegetable matter, producing when boiled, a similar mucilaginous or adhesive solution. In carrying the invention into effect they first boil seaweed or other vegetable product capable of yielding, when boiled a mucilaginous or adhesive solution, and than mix coal-dust with the said solution in the ordinary manner in which cement, mortar, or any other similar material is mixed. The combined materials are then molded to any desired shape by hand, or by means of a brick-making or other suitable machine. The same solution, when combined with sawdust or other suitable material, may be formed into blocks for filtering purposes.

TO BLEACH STRAW.—Straw goods are bleached by submitting them to the action of the vapor of burning sulphur—or better, to the vapor of burning bisulphide of carbon. The straw, which must be perfectly clean, must be well moistened with pure soft water before submitting to the sulphuric oxide. The bleaching is carried on in tight wooden sheds. Straw may be bleached by chlorinated lime, but the fiber is liable to be somewhat injured thereby. Moisten the goods thoroughly in a strong aqueous solution of the bleaching powder (defecated), and then pass them through a bath of sulphuric acid diluted with about 20 parts of soft water. Repeat if necessary, and finally rinse thoroughly in water containing a small quantity of sulphur or hyposulphite of soda.

FORMATION OF ACETIC ACID PREVENTED.—It is said that common rosin prevents the formation of acetic acid in fermented liquids without having any disturbing effect on the process of alcoholic fermentation. The peculiar effect of the hop may be due, it is suggested, to its resinous matter rather than to its oils. Rosin is added to sweet wines in Greece.

TO PRESERVE AUTUMN LEAVES.—Spread the fresh leaves and press them in a suitable dish, with alternate layers of fine sand, which is thoroughly dry, and as hot as the hand can bear. When the sand has cooled they may be removed, smoothed under a hot iron, dipped for a moment in clear French spirit varnish, and allowed to dry in the air.

CHEAP BABBITT METAL.—A cheap Babbitt metal is made by melting separately four pounds copper, twelve pounds tin, eight pounds regulus of antimony. Pour the antimony into the tin, then mix with the copper, away from the fire, in a separate pot, and add twelve pounds more tin.

ANTISEPTIC ACTION OF ACIDS.—According to Sieher a relatively small proportion of acid, 0.5%, prevents putrefaction. This property is conspicuous in the mineral acid, and in acetic acid. Lactic and boric acids are much less effective.

GOOD HEALTH.

Chronic Rheumatism.

Prof. Alfred Stille, of the University of Pennsylvania, lecturing to his medical class, says: Chronic articular rheumatism may follow the acute form if not treated promptly and effectually; or it may occur as a distinct disease, characterized by stiffness and pain in the joints. If the disease appears originally in its chronic form, the joints do not usually undergo any change, but if the chronic stage follows an acute attack they are quite stiff.

(The chronic form is sometimes called "cold" rheumatism.) In this case the sensibility to cold and dampness is rendered morbidly acute. When exacerbations occur the disease assumes a subacute type, and all the joints become red, swollen, and warm. The pain is aggravated by heat. These exacerbations are of indefinite duration.

If the joints have not become positively deformed a cure may be hoped for. If a cure is not established the functions of the joints will never be re-established. These deformities are, in reality, lesions of the soft parts.

In the treatment of the febrile or subacute form, he recommends the local application of heat, the use of the alkalies, moisture, local stimulants, narcotics, and sudorifics; in the chronic form, alteratives, and such local stimulants as camphor, turpentine, ammonia, chloroform, iodine, and even blisters and moxas. In the case of the elbow, knee, and ankle joints a very excellent form of local alterative is sulphur in fine powder laid between the folds of linen and applied to the joints. In all cases, passive motions should be practiced to prevent permanent stiffness of the parts, and the induced current of electricity should be frequently passed through the affected joints.

Local hot baths are peculiarly efficacious in chronic cases: they may consist of hot or warm water, air, or steam; and in this connection some of the saline, alkaline, or sulphureted mineral waters may be employed. The hydropathic pack is often serviceable. The sweating induced by all such baths is exceedingly useful; and this should be supplemented by horseback riding and by walking. If the reaction which follows it is vigorous, sea-bathing is sometimes excellent.

Where the fibrous investments of the joints are swollen, iodide of potassium is effective. All general systemic disorders should at the same time be sedulously treated with iron, quinia, and other general tonics. If there is any biliousness, purges should be judiciously administered.

Should all other measures fail to relieve the patient, he should at once be sent to spend the winter in some tropical climate.

Rheumatic gout (more accurately, rheumatoid arthritis) should be confounded neither with chronic articular rheumatism nor gout proper. Change of structure *in the joints themselves* is the essential symptom of this disorder; whereas, in rheumatism the changes occur in the surrounding ligaments. It may be distinguished from gout by the absence of dusky veins and œdematous swellings. Unlike both those diseases, rheumatoid arthritis begins and progresses very slowly. At first, one or more joints are swollen; then they become deformed by a bony swelling external to the joint itself. Passive motion of the affected part causes pain and a crackling sensation. In time the joints may become disarticulated. This disease is never fatal, but it causes a great deal of suffering, and the limbs are twisted into almost impossible positions. The treatment consists in rest and all possible hygienic comforts, good food, fresh air, plenty of sunshine, and ample clothing. The pain should of course be eased, if possible, by anodyne applications. In some cases good seems to follow the painting of the affected parts with a very strong tincture of iodine; but no internal drugging has in Dr. Stille's experience, been attended with the slightest benefit.

About Poisons.

A poison is defined by Webster as "a substance which, taken into the stomach, mixed with the blood, or applied to the skin or flesh, proves fatal or deleterious; anything infectious or malignant."

Almost everybody knows that arsenic, strychnine, opium and chloroform are poisons; but many people are not aware that many medicines are more or less poisonous, although large doses may be required to cause death or immediate and violent sickness.

The *Journal of Materia Medica* warns us against several "every-day poisons." The first one mentioned is the *bitter almond.* A very little of the essential oil used in flavoring cakes or candies, brings out, on sensitive children, an eruption like nettle-rash, or may bring on vomiting and fatal exhaustion.

Fish of certain kinds are always poisonous in hot countries, and other kinds are more or less poisonous to certain individuals. Many persons have been made sick at one time or another by white fish, salmon or lobster; and the instinct is wise which avoids such articles for ever after.

Lead poisoning from water-pipes, acting slowly and subtly, often goes unrecognized, and is dubbed "malaria."

Pencils, nibbled by school-children five days out of seven, cause disorders which may be falsely charged to bad ventilation or too hard study.

Baking-powders are apt to contain *alum,* which it is injurious to swallow. And the *syrup* which we eat upon our morning cakes may be adulterated with chloride of tin, and cause dyspepsia. While many substances are not poisonous, in the absolute sense of the term, they are deleterious, and affect the human system in a variety of ways. Some persons are not affected by the free use of that which would produce fatal results in others. There are also chemical changes which occur in combining poisonous or injurious substances with other and harmless elements, which deprive the former of their baneful effects. All who desire health and comfort should carefully study the effects of food taken into the stomach, and if deleterious will soon manifest itself, and consequently should be avoided.

OXYGEN IN HYDROPHOBIA.—Oxygen as a cure for hydrophobia, is stated to have proved successful by the *Lyons Medicale.* The case is reported by Drs. Schmidt and Zehedeu, from Russia. The first symptoms of rabies appeared 17 days after the injury. The patient was made to inhale three cubic feet of oxygen, and two hours afterwards he was in a state of perfect calm. Two days afterwards the symptoms of rabies re-appeared, and another inhalation of oxygen was administered with the same success. This time the inhalation was continued for 45 minutes. A slight dyspnœa, which persisted after the disappearance of the graver symptoms, was treated for three weeks by the mono-bromide of camphor.

COFFEE AND NERVOUSNESS.—We have it on the authority of Dr. Bock, of Leipsic, that the nervousness and peevishness of our times are chiefly attributable to tea and coffee; the digestive organs of confirmed coffee drinkers are in a state of chronic derangement, which reacts on the brain, producing fretful and lachrymose moods. Ladies addicted to strong coffee have a characteristic temper, which might be described as a mania for acting the persecuted saint. Chocolate, he adds, is neutral in its psychic effects, and is really the most harmless of our fashionable drinks.

MINING AND SCIENTIFIC PRESS.

W. B. EWER.....SENIOR EDITOR.

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SAN FRANCISCO:
Saturday Morning, Sept. 13, 1879.

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The Week.

It would seem from our exchanges that more energy has been displayed in counting the contents of ballot boxes then the weekly yield of bullion. There is no lack of activity either in prospecting or working. Those of the hydraulic mines, dependent upon a natural supply of water, have suspended operations for the present. In Amador county the Talisman is showing indications of a successful mine. In Calaveras the Gwin mine keeps its batteries constantly employed on ore from the 1400 and 1500 levels. The Mammoth hydraulic has finished cleaning up, with large returns. Mining in Napa county is improving, a new and rich find in quartz having been made by J. H. Francis on his mountain ranch near Calistoga. Prospects for a large yield of ore are good on Rock creek in Placer county. Large and strong ledges are being developed in El Dorado county, particularly in the Sacramento mine, near Shingle Springs, which bids fair to be the richest in the county. The prospecting of the ledge in the Eagle mine, at Grizzly Flat, gives promising results.

The mines of Nevada are constantly improving; most of the districts furnishing increased advantages in quality of output.

The water in the flooded mines of the Comstock is under subjection, and prospecting will soon be in order. Leaving the domain of steady-going mines in California and Nevada, we find that startling discoveries and rich developments are being made in Utah, Colorado and Arizona. The mind wonders at the enormous assays which nearly equal the ton of ore pound for pound, but relief is experienced when later reports show from $30 to $60 per ton as the regular yield. The Alder region in Montana is prospecting very rich, many valuable gold lodes having been recently discovered. Some claim has been created by the discovery of a rich deposit of gold in Calipooia mountains, 40 miles east of the Oregon & California railroad, in the northern part of Douglas county, Oregon. Two miles of sluices have been built, and 100 miners are panning out from 30c to $1 per pan.

The Yellow Jacket Hoisting Engines.

Immense Machinery Built by the Risdon Iron Works.

One of the largest of the large hoisting outfits for mine purposes ever built on this coast has just been completed at the Risdon Iron Works in this city, for the Yellow Jacket mine, in the Comstock. The whole outfit weighs some 350 tons. For beauty of finish, and style in appearance, the machinery excels any yet made here. A noticeable feature is the excellence of the very large castings comprising part of the works, and the care which has evidently been given to all details of the work. These hoisting engines and plant combine all the latest improvements of every kind, and every care has been taken in construction and finish, the whole being done in a thoroughly workmanlike manner, which reflects credit on the builders, exciting the admiration even of experts in that line.

The hoisting machinery consists of a pair of direct-acting engines, complete, with reels, brakes, etc. The two engines work on one crank-shaft, and are 28 feet apart between centers. The engine frames are of the Corliss, or circular patterns, and about 24 feet long between the front ends of the cylinders and where the frames join the pillow-blocks. The cross-head guides are cast with the frames, and are provided with oil-gutters or channels to catch oil drip.

The cylinders are 28 inches in diameter, with eight feet stroke of piston. The exhaust chests are cast on the side of the cylinders, and low enough to have the valve-seats below the bottom part of the cylinder. Each engine has its pillow-block cast in one piece, and bolted to the frame, with side and bottom brasses. The center pillow-block is bored to 21¾-inch diameter, and has a 32-inch length of journal.

The crank-shaft is turned bright. It is 19 inches in diameter at the ends, and 21¾ inches in diameter in the center. The method of construction of the crank and crank-plates is peculiar. There is a crank at each end of the shaft, made of wrought-iron, and 4 feet long from center of shaft to center of pin. The crank-hub is 36 inches in diameter, and 17 inches thick. Each crank is bored, turned and planed on faces and sides, and on each side is forged a tongue to fit in the crank-plates. These crank-plates are of cast-iron, circular in form, and each made in two pieces. When the two pieces are bolted together the disk is 13 feet in diameter and 14-inch face. Each plate has a recess to fit the tongue of iron left on each side of the crank. These plates are turned and finished on faces and edges, after the crank is put in place between the two parts, which are bolted together and enclose it. This is an expensive method of construction, but a most effective one, the forged crank then being imbedded in the cast plate.

The crank-pins are of steel with steel keys. The connecting rods are 22 feet long, finished bright. The two cross-heads are wrought with cast-iron shoes, the shoes being fitted with brass gibs. The piston-rods are steel, 6 inches in diameter. The pistons are 12 inches deep on the periphery, and 15 inches deep through center, each piston having outside and inside packing rings expanded by heavy tempered steel springs. The pistons have solid blocks on the bottom instead of springs. The cylinder heads project six inches inside the cylinders, and are made concave. The outside covers of the back heads are turned and polished, and have upon them, in brass letters, the names of builders and designer. All the glands of both engines, and the bottoms of all stuffing boxes, are properly bushed with brass and sealed.

The admission valves are of brass, of the Cornish pattern, with 9-inch openings. The exhaust valves are of the American double-disk pattern.

The links are solid, wrought-iron finished and case-hardened. They get their motion from the four valve eccentrics. Both links are operated by levers, shafts and quadrants. The expansion of steam is controlled by Crose' variable cut-off. All the working pins through the valve gear are made of steel. Each engine has a 10-inch Cornish valve for throttle working on a separate chest.

There are two reels with twelve movable arms each. The reels are six feet in diameter and seven-inch face. They run upon eight bearing brasses, all adjustable. The reel arms are made adjustable to take in various widths of rope. The brake-wheels are made 15 feet in diameter and 12-inch face. The clutches are 60 inches in diameter and 29 inches long. They are banded with two wrought-iron bands. The clutches are worked by two hydraulic cylinders, eight inches in diameter and eight-inch stroke.

Each brake-wheel has three brakes on each side and one at the bottom. These side brakes are models of strength. They consist of two upright wrought iron trussed arms, 19 feet long, connected on top by a double adjustable rod. The under shoes are 9 feet long and 12 inches wide. The bottom brakes are wrought iron straps. The straps are wood covered, and are operated by a combination of levers. In addition, each crank-plate has a wrought-iron strap brake. Each reel is furnished with one of Behr's patent spiral drum indicators, four feet in diameter and six feet in length.

This machinery was built from designs of W. H. Patten, Esq., consulting engineer of the Yellow Jacket company. The Risdon Iron Works took the contract to finish it in 125 working days, and have completed it 20 days ahead of time. The hoisting works are intended to reach a depth of 4,000 feet, and will start work at a depth of nearly 3,000 feet. The engines have been set up at the Risdon Iron Works this week, where they occupy a space of 36 feet in width, and 56 feet in length. These works also made the four boilers, 54 inches by 16 feet, of the usual style, with the exception that they were made of steel. This is the largest job turned out at any of our foundries this season, and in some respects, the largest set of hoisting works ever built on this coast. The engines will be taken down on Saturday for shipment.

Amalgamating Chloridized Ores.

Usually, in amalgamating chloridized ores, salt water has been added to the pulp in the amalgamating pan, and this water, combined with the chloride of sodium contained in the pulp, formed a brine or saline solution that materially aided the amalgamating process by holding the compounds of the base metals in solution, while the mercury combined with the gold and silver. Each fresh charge of pulp is treated with a new charge of salt water, so that only the salt contained in each charge or portion of brine was utilized for this purpose. It is now found, however, that much better results are obtained by a repeated use of the brine thus formed, instead of depending solely upon the salt contained in each charge of pulp.

The ores of silver are first chloridized, whether with or without gold, by roasting them in the ordinary way with common salt, and they are then amalgamated with mercury in wooden pans or barrels, out of contact with iron, but with copper linings or balls, using in the operation instead of water the liquors from a previous amalgamation. The liquors, after the amalgamation is completed, are carefully preserved for use with fresh portions of the ore previously chloridized by roasting with salt.

The advantage is thus secured of a strong brine for holding in solution the compounds of the base metals, and amalgamation of the precious metals is favored more than can be done with water or the simple use of weak brine, which is ordinarily used with the mercury in working chloridized ores; for the strong brine, holding in solution other chlorides and compounds of base metals, extracted from the previous charges of the ore and used out of contact with metallic iron, acts upon portions of ore not perfectly roasted, and causes a larger yield of the precious metals than can be obtained by the use of salt water, as in ordinary amalgamation.

This process has been made the subject of a patent obtained a short time since thorough the MINING AND SCIENTIFIC PRESS Patent Agency, by Mr. James O. Stewart, of Georgetown, Colorado. It is more particularly intended as an improvement on the Douglass, Hunt & Stewart patent of June 9th, 1874, which differs materially, of course, from the original Hunt & Douglass copper processes. For securing the results of the improvement, Mr. Stewart uses a special apparatus. A store tank is used for holding the recovered salt solutions, and from this tank the brine is drawn into a wooden pan or barrel, where it is charged with the roasted ore. It is then heated by steam, and the mercury is added. In a few hours the contents are drawn off into a settler tub, which is also of wood. When the mercury and amalgam have sufficiently settled, the contents, consisting of ore and brine, are drawn off into a filter tub. Here the brine is filtered out, and allowed to run through a tub which contains copper, or mercury, or both, to precipitate any silver or gold which may still remain in solution, and thence is pumped into another tub to precipitate any copper which may be in solution, and thence to a pump tub to be raised again to the original supply tub, for use again in fresh charges of ore. Any surplus of brine will overflow from this supply tank to an evaporator for boiling or crystallizing the salt. The ore from the filter tub is shoveled into the waste sluice.

In this way the chlorides and other re-agents contained in the lixivium of one charge of ore are utilized upon the subsequent charges.

A USEFUL BOOK.—We have received from C. G. Crawford, printer and stationer, 49 and 51 Park Place, New York, a copy of Frank Fossett's work on "Colorado, its Gold and Silver mines. Farms and Stocks ranges, and Health and Pleasure resorts." A complete tourists' guide to the Rocky mountains. The perusal of Mr. Fossett's book has afforded us much pleasure, and has proved very interesting on account of the information we have gleaned from its pages. We may say that we have not before been able to obtain desired facts concerning Colorado. Obliged to rely on gleanings from the press and an occasional correspondent our stock of knowledge has been quite meager. But in this enticing volume we find collated everything calculated to satisfy our constant demands for information concerning Colorado. We cheerfully recommend the work, not only to those interested in Colorado, but for general reading.

Concrete.

[Written for the PRESS by HENRY G. HANKS.]

San Francisco is destined to be one of the largest, if not *the* largest city in the world, her geographical position being such that this is certain. Nothing but a convulsion of nature violent enough to destroy our magnificent harbor, can prevent it. Assuming this to be the case, should we not lay the foundation of the future city as if there were others to follow us: By taking proper care of our harbor, planning a proper sewerage system, seeking a water supply commensurate with the wants of a large city, and by constructing indestructible buildings? What an oversight, that wide winding streets or avenues like those of Edinburgh, were not laid out in the commencement, with narrower side streets branching from them, instead of our rectangular streets and heavy grades. What a beautiful city San Francisco might have been made. It is too late to correct this mistake, but experience and good judgment may prevent others.

There is no better, or more sensible way to set our idle men to work than to avail ourselves of the wonderful resources which nature has supplied to us with so bountiful a hand. If we could realize the folly of stock gambling and other demoralizing and hazardous pursuits, and settle down to the idea of utilizing the resources we have within ourselves, a new era would dawn on California.

Nothing can be more certain than the fact that we must soon abandon the cheap and temporary manner of building our houses, and substitute stone and brick for the flimsy and shabby redwood we have used for so many years. We cannot afford to rebuild the city three or four times in a century. It has been absurdly maintained by some that San Francisco can never be built like other cities, of fire-proof and indestructible materials, which would imply that it must ever remain a cheap wooden city, as at present.

It may be well to state the objections that have been made to buildings of stone and brick in California. The physicians say that these buildings are not so healthy as those of wood; that they absorb water from our moisture-laden sea breezes. But with all due deference to their opinions, I believe that they are too hastily taken. If houses are properly built this objection falls to the ground. In this country it is as necessary to paint the outside of a brick or concrete building as it is to paint a wooden one, and costs no more. Marble and other first-class building stones do not absorb moisture, and then the device of building the walls double may be adopted, which will effectually remove this objection. But do what we may, we shall soon be driven to the necessity of seeking some other building material, as the redwood forests are being rapidly exhausted.

Another objection not so easily disposed of, is the fear of earthquakes, for they are still to be dreaded. Yet, while badly constructed walls are easily destroyed, well-built masonry may be rolled over like an iron safe without being broken. Valparaiso and Naples are instances of well-built cities, often called upon to withstand earthquake shocks. Other objections have been offered, but they are of so trivial a nature as not to be worth mentioning.

Although stone, brick and iron cannot be dispensed with in building a great city, yet some cheaper and more convenient material is sometimes desirable.

It often becomes necessary on hillsides to erect heavy walls to protect the elevated banks of earth left standing by our senseless system of grades. Nothing is better suited for this purpose than well-prepared concrete; while for cesspools, cisterns, cellars, foundations, garden-walks, etc., nothing could be better adapted, while hard-burned clay sewer pipes supply the want of a cheap and convenient way of obtaining perfect sewerage, and perfect sewerage insures a healthy city. Too much cannot be said in favor of this system.

I have read with pleasure an article in a late issue of the MINING PRESS, on "Concrete as a Substitute for Stone in California." The writer, although he has given a good idea of the importance of the matter, has not fully stated it.

The French word, "beton," has the same signification as the English word "concrete." Common beton is an artificial conglomerate of sand, pebbles, broken stones, and lime.

Beton Coignet, named after the inventor, Francois Coignet, of Paris, is an artificial concrete stone, which is made of an intimate mixture of lime, sand and water, which must be properly proportioned, or the result will not excel common mortar—which it really is in composition. The theory of the hardening of mortar is too well known to require mention here. An excess of lime makes it friable; while an excess of water produces a similar result. It is well known that sandstone consists of sand held together by small quantities of cementing substances, such as carbonate of lime, oxide of iron, etc. In preparing Beton Coignet, sandstone is imitated as nearly as possible, by aiming to have only lime enough to coat the grains of sand and leave no excess. When the hydrate of lime absorbs carbonic acid from the atmosphere, and becomes carbonate of lime, an artificial sandstone is formed, which experience has shown, is equal in many respects to the natural stone. It has been found that the character of the stone

varies with the nature of the lime employed. Common lime, which is pure carbonate of lime, or calcite, rendered caustic by heating strongly in a lime kiln, by which the carbonic acid is driven out, sets slowly, and a long time is required for the chemical changes to take place which have been mentioned. Hydraulic lime sets quicker; and cement still more so.

Hydraulic limes are variable in their composition, but they may be divided into two classes—those containing, besides carbonate of lime, fine silicious sand, and for that reason called "silicious limes"—and those containing from 8% to 18% of clay, and called "aluminous limes". When containing from 18% to 36% of clay and a certain quantity of magnesia, they are called cements.

As the cements vary in character, and as much judgment is required in properly burning them, they cannot always be depended on; some of the best are made artificially, by adding the proper proportion of clay and other substances to the lime, and burning them together. The natural cements are unreliable unless they are carefully selected and properly burned.

When beton is mixed ready for use, it is only slightly moist, and appears like damp sand—it is handled in boxes or wheelsd in barrows, and when laid in place is tamped with pestles of iron weighing 15 lbs. and upward.

On a large scale, mixing cylinders driven by steam power are used, and belts with buckets on the plan of an elevator are employed to convey the concrete to the mixing cylinder. On a small scale it may be mixed with a hoe on a surface of boards.

Lime for common mortar should be slacked at least 24 hours before used; but for "Beton Coignet" it should be slacked but two hours before required for mixing, and only water sufficient added to cause it to fall to a powder.

A general rule for compounding Beton Coignet may be thus stated:—

Sand—Four to five parts by measure.

Lime—Common or hydraulic, one part by measure.

Cement—One-quarter or two-thirds of one part by measure.

Water—A sufficient quantity.

The exact proportions vary in accordance with the quality of the ingredients and the requirements of the concrete.

For the construction of the walls of common buildings, cellars, foundations, etc., where great strength is not required, a mixture of five parts of sand, one part of lime, and the usual quantity of water is used.

For arches, vaults, cesspools, etc., requiring more strength, the following mixture is used: four parts of sand, one of lime, and one-half part of Portland cement.

For heavy walls to support embankments the same composition is employed, but the wall is so constructed, by being built into the bank, as to support its weight.

For flagging cellar floors, sidewalks, etc., five parts of sand, one part of lime, and one part of cement may be used.

For foundations for heavy machinery the following mixture is recommended: sand, five parts; lime, one part; cement, one-fourth of one part.

Many miles of the main sewers of Paris are constructed of concrete, and are found to be quite equal to those of stone masonry, and very much more economical. The following proportions are used:

175 cubic feet of sand.
35 cubic yards of hydraulic lime.
550 lbs. of heavy Paris cement, equivalent to Portland cement.

The ingredients are mixed by machinery on a large scale.

Concrete may either be molded into blocks and laid in mortar like common stone, or built up in a succession of layers making the wall solid or "monolithic," as called in France. For this purpose a crib of boards is made which is movable, the sides are separated from each other the width of the intended wall, and held in place by iron rods which pass through the wall and are afterwards drawn out. The loose concrete is shoveled in and tamped. It is allowed to remain until the concrete sets, when the sides of the crib are taken down and shifted upwards for another course.

One of the advantages in the use of concrete is that skilled labor is not essential to its use. Suppose that some house owner desires to construct a cesspool, and wishes to do it himself at odd spells when he can spare the time, he has only to have a circular frame made the size of the interior of the intended structure. It is imperative that it shall be so constructed that it can be taken to pieces from the inside, and it need only be a foot or 18 inches high. Thus provided, and with materials and conveniences for mixing, a circular hole is dug the required depth and wider than the circular mold by the thickness of the required wall. As the whole structure will be under the ground the outer surface of the wall may be disregarded. The mold is set in place and the outer space filled up with concrete, tamped thoroughly and allowed to set. The boards are then removed and the circular space within the wall filled up to to the level of the course, the mold is again adjusted and a second course of concrete laid. This is continued until the surface of the ground is reached; it is then only necessary to dig out the earth again, which has acted as a scaffold, and the work is finished. It may then be covered and put to immediate use. In the same way garden walks, parapets to support terraces, steps, etc., may be made.

An aqueduct which supplies the city of Paris with water is partly constructed of Beton Coignet. In the forest of Fontainbleau are three miles of arches some of them 50 feet high, the whole is built of concrete including the pipes and arches.

A Gothic church, with spire 130 feet high, near Paris, is built wholly of concrete.

At Port Said, the northern entrance of the Suez canal, the lighthouse and the jetties are all of beton. Twenty-five thousand blocks of beton were laid, each of which weighed twenty-five tons.

At the harbor of Algiers in Africa, the French have contructed enormous works of concrete. The harbor was first laid in large blocks of natural stone, but it was found that the action of the waves was so great that the walls were washed away. It was calculated that blocks of sufficient weight to withstand the waves during heavy storms would require a volume equal to 353 cubic yards. To quarry and transport these blocks to the harbor mouth would entail enormous expense, and the experiment of substituting blocks of concrete was tried, and they were found to be fully equal to the emergency. The entire work was finished in five years, at an expense of $420,000.

It will be seen that there are many ways that concrete may be utilized; and if the California cement is what your correspondent represents it to be, the materials can be cheaply and abundantly supplied, and it is to be hoped that your readers will avail themselves of the advantages this system offers.

Ice Making in Sacramento.—The Sacramento *Times* has the following note on a local enterprise. A visit to the premises of Coles Brothers, on K street above Tenth, shows a steady and substantial progress towards completion of their machine for supplying this city with ice. The Pictet ice machine is based on an entirely different principle to that employed by other manufacturers, and it is claimed that ice can be produced more rapidly and at less cost than by any other system. The air of stability that pervades all the operations of the Coles Brothers, indicate that they mean business and have come to stay. They do not intend to sell out, and pledge themselves to supply ice to consumers for at least one cent per pound less than the present rates, an item that will be of some consequence to buyers. An interesting trial of the machine will shortly be had in one of the Comstock mines, for the purpose of applying the principle to the cooling of the lower levels, and doing away with the expensive and unadequate machinery now in use. If the experiments proves successful—and they claim they can cool the mines to an ordinary temperature—there will be "millions in it."

California Salted Herring.—Another illustration of the infinite variety of material in California, for the practice of nearly all the industries known to a world of workers, may be found in the production of salted and smoked herring around Monterey bay. The Monterey *Democrat* has been given a sample by John Parker, and the editor pronounces them excellent eating, reminding him in flavor and consistency of the famous Dutch herring. Millions of these fish enter Monterey bay every year, their shoals being measured by thousands of yards on the surface and swimming 16 or 20 feet deep, close as the fish can manœuvre their bodies. They might be the source of inexhaustible wealth, if salted or smoked, as on the coasts of northern Europe.

There are 900 tons of standard silver dollars stored in the Treasury at Washington.

Measurement of Earthquakes.

In a series of recent articles in the Press upon the subject of earthquakes, we briefly alluded to the fact that by proper appliances, the depth, direction an intensity of the earthquake waves, or trembling sensation experienced by the shock, could be measured. Our attention has been called to a variety of instruments for the purpose, which appear in Prof. Le Conte's geology, an excellent work published by D. Appleton & Co., of New York City. In spite of the many opinions that have been expressed concerning the interior condition of the earth and the causes that seem to suggester a continual vibration of some part of the earth's crust, there is still great obscurity hanging about the subject. There can be no doubt, however, that in the phenomena of earthquakes, there exists means of solving many problems which now seem beyond the reach of science. The depth of the origin of earthquakes, which, as we remarked in a former article, probably arises from an explosion of some pent-up force or power producing air explosion, is a material point in solving the problem of volcanoes. The point at which the explosion, which produces the earthquake occurs, is sought to be determined by means of an instrument termed a seismometer, or "earthquake measure." There are many forms of instruments for this purpose, the two most important of which we shall here mention.

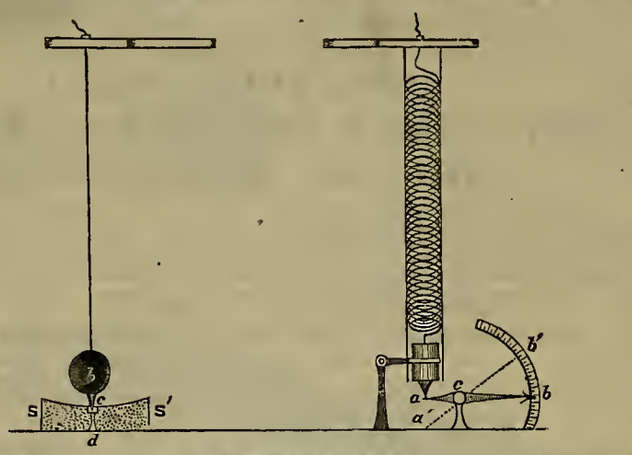

Fig. 1. CAVALIERI'S SEISMOMETER. Fig. 2.

An excellent instrument for recording slight tremors is one invented and used by Prof. Palmieri, of the Vesuvian observatory. It consists of a telegraphic apparatus with the usual paper-slip and stile. The paper-slip, accurately divided into hours, minutes, and seconds, travels at a uniform rate by means of clock-work. The battery-circuit is closed and opened, and the recording stile worked by the shaking of a metallic bob, hung by a delicate spiral spring above a mercury-cup; the shaking of the bob being determined by the tremor of the earth. Such an instrument records the exact moment of occurrence of earthquake shocks, however slight; also, the moment of passage of every wave and its time of oscillation; and if there be more than one such instrument, the moment of occurrence at different places give the velocity of the surface wave, *v'*. It *records*, however, rather than *measures* earthquake phenomena; it is a seismograph rather than a seismometer.

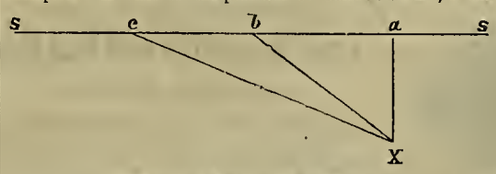

Fig. 5. Angles of Emergence.

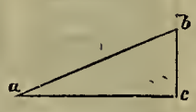

Fig. 3. Diagram of Vibration.

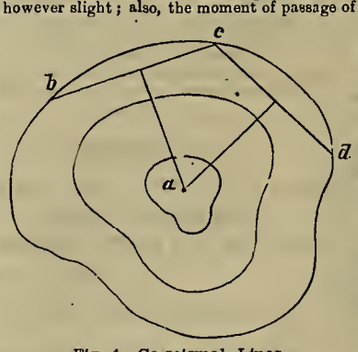

Fig. 4. Co-seismal Lines.

The best form of seismometer which we have seen described—that which gives the most important information—is that of Prof. Cavalleri, of Monza. It consists essentially of two pendulums, one horizontally and the other vertically oscillating (Figs. 1 and 2). The former is an ordinary pendulum, with a heavy bob, *b*, armed with a stile which touches a bed of sand, *s s*. The sharp point of the stile rests loosely in a slight depression in a small flat cylinder or button, *c*, resting lightly on the top of the firm column, *d*. When the earthquake-shock arrives, the whole building, and therefore the attachment, *a*, above, and the bed of sand, *s s*, on the floor, will move in the direction of the shock. This direction will generally be partly horizontal and partly vertical. We will consider now only the horizontal element. The pendulum, *b*, will tend to retain its position, and the bed of sand will move beneath it, first in one direction and then in the other, and the stile will thus mark the sand back and forth to a distance equal to the back-and forth motion of the earth. The direction from which the impulse came is determined by the side on which the little cylinder falls. It is easy to connect the pendulum with a clock set at 12, in such wise that the motion of the former will instantly set going the latter. The difference between this clock time and the real time will give the *instant of transit*. It is clear that this pendulum does not give the whole amount of the vibration or motion of the shock, but only the horizontal element. If *a b* (Fig. 2) represent the direction and amount of vibration, then *a c* is the horizontal element measured by the pendulum. This instrument, therefore, gives the moment of transit, the direction of transit, and the horizontal element of vibration.

The vertical element, *b c*, of the vibration is given by a vertically oscillating pendulum (Fig. 2), the point of which rests lightly on one arm, *a*, of a very easily-moved lever, the other arm, *b*, of which acts as an index by means of a graduated quadrant. When the shock moves the floor of the building upward, the heavy weight of the pendulum retaining its position by stretching of the wire spring, the arm *a* is pressed against the stile, and the arm *b* is elevated; when the floor descends again, *b* is retained in its elevated position by a ratchet at *c*, and thus records the amount of elevation of the floor. This pendulum, therefore, gives the upward movement or one-half the vertical element. Having now the horizontal and vertical element, *i. e.*, the base and perpendicular of a right-angled triangle, the hypothenuse, or whole oscillation, and the direction of oscillation, or angle of emergence (*a*, Fig. 3), are gotten by simple calculation, or by accurate plotting.

The important facts recorded by this instrument are: 1. The *instant of transit*; 2. The *direction of transit*; 3. The direction of oscillation, or *angle of emergence*; 4. The *amount of oscillation*. From these elements (if we have several seismometers scattered about the country) may be calculated: 1. The *velocity of transit*; 2. The *position of the focus*; 3. The *form of the focus*, whether point or fissure; 4. The *force of the original concussion*. The most important of these are the position and depth of the focus.

It must be borne in mind that the trembling of the earth is the *result* of a shock occurring somewhere in the interior of the earth, which causes a vibration of the earth's surface in waves similar to the action of water when its surface is disturbed. Now these vibrations, which are termed earthquake waves, begin at the point of the explosion and spread with greater or less rapidity, according to the geological nature of the strata, until they strike the surface of the earth at a point nearest the explosion point, whence they extend over the surface of the earth in different directions. The point at which the wave first strikes the surface of the earth is called the "epicentrum," and to find this point is to locate as near as can be the origin of the earthquake, by means of the seismometer the direction of transit of the surface-wave. If, by the use of many such seismometers, or even by rougher methods, we get a number of these surface-lines of transit, by following these back we get the epicentrum at their intersection. Or if, by means of many seismographs giving time of transit, or even by observatories or stations of any kind with accurate clocks, we get several points of simultaneous arrival of the wave, then by drawing a curve through these points we have a coseismal curve. A perpendicular drawn from the middle point of the line joining any two of these points will pass through the epicentrum, and two such perpendiculars would determine its position. Fig. 4 represents coseismal curves, and *b*, *c*, *d*, three points on the curve; *a* is the epicentrum.

The spherical wave is a wave of longitudinal oscillation. The direction of oscillation, therefore, is the same as the direction of transmission (wave-path), which is the radius of the agitated sphere. If, therefore, the direction of the ground-motion (the line *a b*, Fig. 3) be followed into the earth, it carries us back along the wave-path to its origin, the focus. Two such wave-paths by their intersection would determine its position. Thus, in Fig. 5, if c and *b* be the position of two seismometric observatories, the angles of emergence, *x c a* and *x b a*, being given by observation, and the distance, *c b*, being known, we have all the elements necessary to determine either by calculation or by accurate plotting the wave-paths c *x* and *b x*, and their point of intersection *x*, and therefore of the depth *a x*.

Although seismometers, such as we have described, are necessary for accurate results from few observations, yet by multiplying the observations, even by rough methods, approximative results may be obtained.

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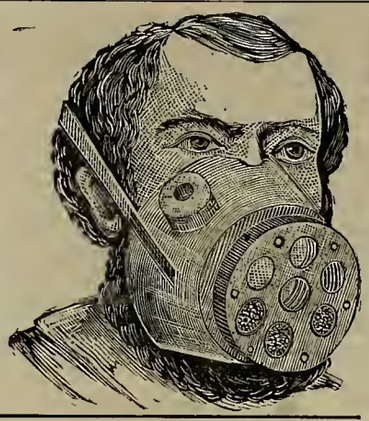

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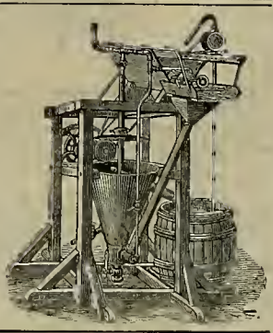

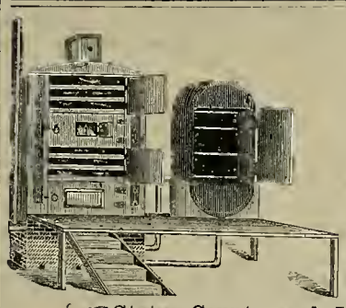

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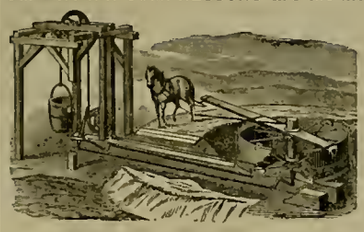

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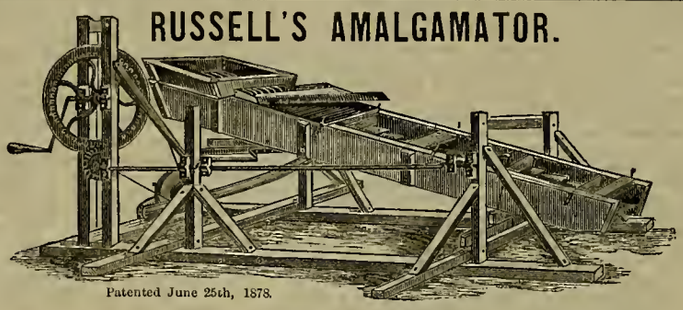

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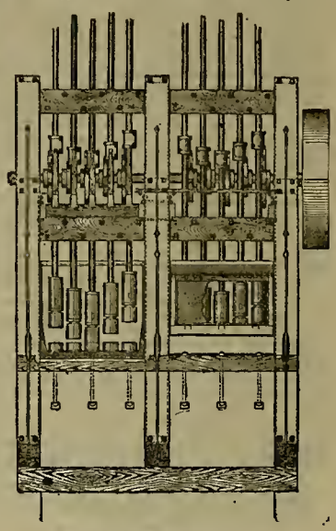

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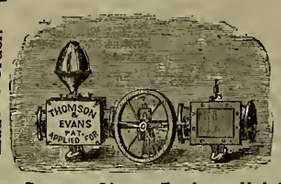

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Will find it to their advantage to call on us at 328 BUSH STREET, bet. Montgomery and Kearny, (up-stairs,) S. F.

[CONTINUED FROM PAGE 165.]

COLORADO.

ITEMS.—Exchanges to date: Senator Jones asserts that the deepest mine in Leadville is down only 120 feet. The mineral deposits lie flat and are of immense size. Many fortunes have been made there, and the Senator says it is the best place for a poor man to prospect in, with more chances of striking mineral than in any other district. In fact, all the chances are in favor of striking ore by digging, and when once struck there is no trouble in extracting it. The city at present contains about 30,000 people and is still growing. A run from the Horn Silver mine, in the Eagle River country, makes a showing of 1,611 ounces. The Tribe of Ass mine, on Iowa gulch, assays 96 ounces. Jay G. Kelley found gold-bearing quartz near the city that assays $4,000 to the ton. Further particulars cannot be given. A washing from a single pan from the Mount Pleasant placer, at the head of Iowa gulch, shook yesterday yielded nine cents in gold.

FAIRPLAY, Park Co.—*Tribune*, Sept. 3: Last week the Sacramento mining company of the district of that name shipped 19 tons of high-grade ore, running from 250 to 400 ounces silver to the ton.

ALMA.—The shaft in the Fannie Barrett mine is now 44 ft deep, and as ore was encountered 6 ft from the surface there is now a body of ore exposed 38 ft in thickness. The Mount King mine has a fine body of ore running from $200 to $300 per ton in silver. The property is 2½ or 3 miles from town. One thousand or more men are prospecting here, some of them within a few hundred ft from the town. Some ore was brought down from the Truman mine, at the head of Mosquito gulch, that assayed 3,410 ounces silver per ton. The Grace mine adjoining is doing tip-top and is shipping high-grade ore. One piece of float ore, in the form of a boulder, was found in the timber near the edge of town, that when broken up and brought to the sampling works fetched $25. The Russia mine on Mount Lincoln is taking out considerable ore, the select runs about 1,570 ounces per ton. This has been a steady producing mine for several years. Some rich specimens are being brought in from Mount Silverheel, found in the float. This district is producing considerable silver.

SILVER CLIFF.—*Prospector*, Sept. 1: The Wet Mountain mining and improvement company have five mines, with good prospects, showing true fissure veins, two or more of which they contemplate working for depth. Thus far their lodes have shown good mineral, both in gold and silver. The Red Rose is now showing mineral quartz, the finest that has yet been discovered. The Silver King has thus far proved very rich. The Humboldt has been opened richly, while the Terrible bids fair to prove a grandly rich paying mine. Following these comes the news from Gibson gulch, 11 miles east, in Verde district, of the discovery of silver, gray copper and free gold in great abundance. The specimens from the Gibson lode, the Uncas, were extremely rich, showing ruby silver and free gold in goodly quantities. The Uncas is but 17 ft down, yet its owner informed us that he had a good pay-streak and five tons of rich ore on the dump.

IDAHO.

ITEMS.—*World*, Sept. 2: The mines on Wood river at Yankee Fork are not narrow as was first thought. They widen in depth and are very rich. Several rich discoveries have been made in the Saw-Tooth range. A clean-up has just been made from 81 tons of ore from the Ebenezer mine at the Gold Hill mill. The yield was $8,375, or over $78 per ton. The fineness of the gold was 876.

MONTANA.

ITEMS.—Butte *Miner*: In Missouli county a placer claim of 100 acres has been located on Front creek near Cedar. The creek is 30 miles long and claimed to be very rich in gold. The Alexandra, a new claim 350 ft south of the Lexington mine, has been opened, it shows at the surface a three-ft vein of low-grade ore, which is expected to improve with depth. It pitches to the south, with a grade similar to the Lexington. A rich strike has been made in the Alder gulch near Virginia City. At the head of Alder gulch the country rock is slate. Further down the creek it is granite, and it is right on the line of junction of the two different formations, the granitic and slate, that the new lode has been discovered. The ledge is about 100 ft in width, bearing gold in every portion, no part of it yielding less than $12 per ton. The first-class ore is found in a vein 15 ft wide, which averages a little over $100 per ton. The quartz is very soft, so soft that it can be panned or washed in sluice boxes and a very considerable proportion of its treasure saved by that primitive process. In Hungry Hollow, a tributary of Alder, a rich gold lode has been discovered. Mr. H. Gray, who has been working the Boaz lode, in Hot Spring mining district, made a clean-up last week, which yielded between $4,000 and $5,000. We did not learn the number of tons of ore crushed.

MADISON COUNTY.—The silver mines in the Potosi district are being quietly, but systematically developed, and, we are informed, with very flattering prospects. The ores there are said to be very rich, and we fully expect to see a large mining town in that region very soon. The miners down the gulch are doing exceedingly well this season. The flume of E. F. Bond, especially will yield a rich harvest of dust. A good deal of the work done this season has been done on heretofore unworked ground.

NEW MEXICO.

GRANT COUNTY.—*Herald*, Aug. 30: A dozen mines are being worked at Hillsborough. The "Weeks" mine is a true fissure vein, and ore is better at 80 ft. Assays from bottom of main shaft give five ounces of gold per ton. Twenty men are at work, taking out about 1½ tons each per day. The King mine is yielding rich returns. A recent run of ore exhibited $124 per ton. The mill is running on full time with plenty of ore. Several mines are being developed at Shakespeare.

GENERAL ITEMS.—A party of prospectors have struck some silver leads near the head of the Vermejo. At Georgetown rich ore is being taken from the "Commercial" and McGregor mines. In the former are several streaks of high-grade ore. Both horn and native silver exist in large quantities. In the "McNulty" mine considerable high-grade ore is taken out. Many miners are prospecting in the Black Range, east of Georgetown. Some large ledges have been found showing metal. Meredith & Allman are concentrating the ore from two years' tailings at their mill. They are getting about 200 lbs of good metal from each ton of tailings, which will probably assay high. The ore which they are now extracting may be called the sulphide of silver, although it contains a good deal of chloride.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Alexander, Sept. 4th, $8,779; Hillside, Sept. 5th, $4,100; Hillside, Sept. 8th, $4,300; Ophir, Sept. 6th, $25,767.97; Northern Belle, Sept. 3d, $2,870.19; Con. Virginia, Sept. 2d, $52,669.08; California, Sept. 6th, $54,029.52; Grand Prize, Sept. 8th, $13,000; Belle Isle, Sept. 8th, $25,000; Martin White, Sept. 3d, $3,462.21; Bodie Con., Sept. 9th, $24,500; Northern Belle, Sept. 6th, $4,696.01; Tiger, Sept. 9th, $18,000.

IN San Francisco half dollars are quoted at 99½ buying, 99¾ selling; trade dollars, 97 buying, 98 selling; Mexican dollars, 98 buying, 98½ selling.

OF the ten-dollar refunding certificates, the Treasury Department has sold $40,012,750.

Mining Decisions.

In the case of the Adelaide Consolidated Silver Mining and Smelting Co. vs. Gallagher and others, it appears that the defendants made application for a patent for the Camp Bird mining claim, entry No. 130 of survey No. 237, in the California Mining District, Fairplay Land District, Colorado. By the survey the claim is represented as a parallelogram, 1,500 feet in length by 300 feet in width. The survey of the lode in the claim crosses the "Adelaide Lode" at nearly right angles, and the amount of surface ground contained within the Adelaide claim at the point of intersection is 2,972 acres. The preliminary proceedings were in strict conformity with the requirements of the mining law, and no adverse claim was filed or suit commenced during the period of publication. The Gallaghers afterwards made entry of 7.305 acres of surface ground of said mining claim, being the exact amount of land contained in the survey thereof after deducting the surface ground contained in the Adelaide claim at the point of intersection. This amount of land appeared in the published notice of the application for a patent. The Adelaide Co., however, filed a protest in the land office claiming that by the description in the official survey it would appear that the Camp Bird Co. intended to take the land at the point of intersection of the two claims, and among other things asked that a clause be inserted in the patent issued on the Camp Bird claim excepting and excluding the area in conflict with the Adelaide claim. The Camp Bird Co. disclaimed any interference with the surface of the Adelaide claim, and admitted the priority thereof, but claimed that such a reservation in the patent would be unneual.

The land office, however, decided to approve the Camp Bird application and to issue a patent thereon with an excepting clause, which excepted and excluded from "this conveyance all surface ground contained in the Adelaide location, as shown by the foregoing description, together with all veins, lodes and ledges lying and being therein, to which the said Adelaide mining claim is entitled by reason of its said location." Both parties appealed from this decision.

Secretary Schurz, in his decision, among other things, says: "The only law relating to cross lodes is found in Section 2336 of the Revised Statutes, and is in these words: Where two or more veins intersect or cross each other, priority of title shall govern, and such prior location shall be entitled to all ore or mineral contained within the space of intersection; but the subsequent location shall have the right of way through the space of intersection for the purposes of the convenient working of the mine. And where two or more veins unite, the oldest or prior location shall take the vein below the point of union, including all the space of intersection.

"Under this statute the right of the parties are made to depend upon the fact of actual intersection of the veins, and priority of location; matters which it is the peculiar province of the judicial tribunals to determine; yet, in cases where mining locations cross each other, and there is reason to believe that a contest may arise in future, the rights of neither of the parties in interest should be prejudiced prior to a judicial determination thereof, by the insertion of unnecessary *habendum* or *reddendum* clauses in the patent.

"In this case the Camp Bird Co. has not entered, and is not asking for a patent for the surface ground embraced in the Adelaide claim at the point of intersection of the two claims, yet its vein may extend through the ground belonging to the Adelaide and still not intersect with the Adelaide vein. In that event, the right of the Camp Bird owners to pursue said vein through the ground of the Adelaide at the point of intersection of the two claims is vested by law, and ought not to be limited by the patent; while on the other hand, the right of the owners of the Adelaide to pursue their vein is equally well protected by the statute, and should not be prejudiced by the grant to the Camp Bird Co. Under the circumstances of the case, the only way by which the interests of both parties can be fully protected is by making the excepting clause in favor of the Adelaide Co. as broad as the granting clause to the Camp Bird Co.; for, by so doing, both will receive all that the law gives them, and neither will have any legal advantage."

Mr. Schurz, prescribing a form which would in his opinion best protect the interests of the parties, adds this proviso: "*Provided*, That nothing contained in this grant is intended to interfere with the legal rights of said claimants in case said veins are found on exploration to intersect with each other," which was ordered to be inserted in the patent, so as to make the excepting clause as broad as the granting clause therein.

In the case of the Iowa Mining Co. vs. Bonanza Mining Co., on appeal from the land office, Secretary Schurz held

"1. A failure on the part of an adverse claimant to prosecute his suit to judgment with reasonable diligence shall be a waiver of his claim.

"2. The question of diligence in the prosecuting of a pending suit is as much a question for the determination of the court as any other question of law or fact which may arise in the progress of the case, and one which, after the court has acquired jurisdiction, should be left for its determination."

The case involved a controversy about certain mineral lands in the Virginia Mining District, Carson City Land District, Nevada. The plaintiff had commenced suit on its adverse claim in the District Court for the First Judicial District of Nevada, but had not taken any steps to prosecute its suit. The land office decided that the Iowa Co. had waived its adverse claim by a failure to prosecute said suit with reasonable diligence, and that the Bonanza Co. was entitled to a patent for the land on fully complying with the requirements of the mining law. Secretary Schurz decided that the Nevada court had acquired jurisdiction over the cause, and that the land office had no power to interfere with matters which the court alone should determine, and hence, although the lack of diligence was a waiver of the claim, the court in which proceedings were pending could alone determine whether there had been such a waiver. The decision was therefore reversed, without prejudice to the rights of either party, and further proceedings stayed to await the result of said suit.

The Mechanics' Fair.

The following are some among the most interesting exhibits in the fair:

The Union Iron Works.

The Union Iron Works (Prescott, Scott & Co.) make an exhibit of some few of the engines, hoists, etc., which they have on hand, but, of course, cannot display any of the heavy mining machinery which is a specialty of the establishment. They show a few of the articles, however, which they make, among others, vertical, horizontal, compound and marine engines, direct acting, hoisting and pumping machinery, steam pumps, a quartz mill, etc. We have described the Bruckner mill, displayed in this exhibit. Another feature of interest is the Waterhouse & Brewer engine, a little machine of very simple construction, which can be used either single or compound. This engine is intended for small power, and is so made that it can be sold at remarkably low prices, as compared with those of ordinary construction. Prescott, Scott & Co. have taken hold of the engine with a view of introducing it in places where a small and single power is required.

The firm are well known in the community, the foundry being the largest in the city. Mr. Irving M. Scott, one of the firm, is President of the Mechanics' Institute. The works have been running many years, and build steam, air, and hydraulic machinery of all kinds. They are provided with all the largest and most improved tools in the business, and the shops are the most completely outfitted of any in the State.

Kortick's Safety Hook.

Mr. Frank Kortick exhibits a peculiar safety hook, which he recently patented through the MINING AND SCIENTIFIC PRESS Agency, which is intended more particularly for use in connection with the bits on harness, or as an attachment of the whiffle-tree, by which tugs may be connected with them. The device consists in the employment of a hook having a slotted shank which receives the link, the hook being pivoted, so that its center of motion in the center of the circular head of the connecting bar and the point of the hook lies so near the edge of this disk that it prevents the link or ring from being removed, unless the hook is turned to a point where a semi-circular notch is formed in the head, so that the ring may drop into this notch, and allow the hook to swing past it, when it may be removed; at all other times it will be securely locked in place. The advantages are the simple method by which the connection is made or unmade, and the impossibility of unlocking it except when desired.

Overend's Feed Water Heater and Pump.

In the model case of Dewey & Co.'s MINING AND SCIENTIFIC PRESS Patent Agency exhibit at the fair, is shown a model of a feed water heater and pump, patented some time since by John A. T. Overend of this city, and in use in a number of places here. It is a simple, cheap and durable heater, condenser and pump combined, requiring but very little power to operate it, and saving a large per cent of fuel and water by mingling the exhaust steam from engines directly with the cold feed water, thereby heating the feed water and condensing the exhaust steam, and forcing, with a pump, into the boiler a sufficient quantity of water thus obtained to supply it at about 212 degrees of heat. This pump can be used separate from the condensing chamber and heater, if desired, for pumping cold water or liquids; or it may be used as a hand pump as well as by power. One of these pumps may be seen at work at Mr. Overend's, No. 506 Commercial street.

Miller's Pressure Blower.

Mr. Morgan B. Miller has connected, so as to be shown running, one of his improved fans or pressure blowers, recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency. The blades of the fans are made in a peculiar shape, so as to utilize all the surface, and around the periphery of the fan box is a pressure chamber, into which the air is forced and compressed by the fan, and from which it is led off by discharge pipes. This fan is very easily run, and really compresses the air so effectually as to give a much greater volume of air than ordinary blowers of twice the size.

News in Brief.

HEAVY, continuous rains prevail on the Island of Cuba.

THE Mechanics' fair opens at Portland, Or., October 15th.

THE yield of crops in Idaho this season is unprecedented.

THE weavers at Fall River, Mass., have voted not to strike.

WORK has been commenced on the Nevada Central railway.

THE Governor-General of Canada arrived at Toronto, Sept 9th.

EIGHTEEN deep-water ships arrived in San Francisco Sept. 9th.

A DAMAGING drouth prevails in the province of Chekiang, China.

A SEVERE frost has caused immense injury to the coffee crops in Brazil.

THE steamer *Bengal*, from Montreal for London, grain laden, is ashore.

DURING August 1,638 carloads of grain were landed at South Vallejo.

A MINISTER was beaten to death Sept. 9th at Zaleski, O., by his son-in-law.

THE inhabitants of Novi-Bazar have determined to resist Austrian occupation.

SIX miners were suffocated in a mine at Alta, Utah, last Saturday by poisoned air.

THE Memphis Odd Fellows appeal to the Brotherhood at large for material aid.

BLORE, formerly architect to Buckingham Palace and Westminster Abbey, is dead.

EIGHTY-FOUR young persons have left Moscow under sentence of hard labor in Siberia.

SILVER in London, 51⅝d, consols, 97 11-16; 5% U. S. bonds, 105½; 4s, 105; 4½s, 108¾.

IT is believed in Madrid that King Alfonso's marriage will be celebrated in December.

THE Indians have deposed their chiefs at San Bernardino without causing an outbreak.

ALL the Vancouver Island Indians have gone to Puyallup valley, W. T., to pick hops.

THE surrender of Cornwallis is to be celebrated on the 19th of October at Yorktown.

CROPS in Bulgaria having failed, the government has forbidden the exportation of cereals.

LEONARD, son of Nathaniel Montefiore, of London, died last Saturday at Newport, R. I.

FULLY 1,000 silk operatives have arrived at Paterson, N. J., this year, from foreign lands.

PENNSYLVANIA is nearly clear of tramps, owing to the stringent law and the revival of business.

THE state of siege has been raised in the Bulgarian districts of Rasgrad, Simla and Osman Bazar.

SEVEN persons were drowned lately by the sinking of a yacht in Henderson bay, New York.

DR. SAMUEL A. FINLEY, ex-Surgeon General U. S. A., died in Philadelphia Sept. 9th, aged 82 years.

HIGH water prevails in St. Petersburg, and violent wind storms have done considerable damage.

AT Liverpool wheat is quoted at 8s 6d@9s 6d for average California white, and 9s 5d@9s 10d for club.

THE Mussulmans in Eastern Roumelia declare that they prefer a Russian to a Roumelian government.

AN insurrection has broken out in Kardistan.

THE Pennsylvania State fair is in progress at Philadelphia.

GENERAL GRANT is to be received in San Francisco, with a general welcome, outside of all party lines.

IT is estimated that about $100,000,000 will be sent to this country from Europe during the present year.

JAY GOULD tells the Howard Association of Memphis to keep at its noble work and he will foot the bill.

A LARGE force of men are engaged on the work of the locks and canal of the cascades of the Columbia.

A DISPATCH from Paris announces the death of Baron Isadore Taylor, the well-known author and traveler.

THE ship *Frank F. Curling*, from Maine to San Francisco with 2,600 tons of coal, has foundered off Cape Horn.

AN appeal is to be made to the Irish people in all parts of the world, to aid in the creation of a class of peasant proprietors in Ireland.

SERIOUS trouble is reported from Cabul, the British Embassy having been attacked by several Afghan regiments, and the British representatives massacred.

AMERICAN LOCOMOTIVE.—The American locomotive exhibited at the Paris exhibition was recently sent to Milan for trial, having been refused at Florence. Great opposition has been made to it by the Belgian and English makers of locomotives, but in spite of foreign jealousy, it is probable that a trial will be accorded, and it is thought that the prospects are bright for the introduction of American locomotives on Italian railroads.

PRESSES AND DIES.—Attention is called to the advertisement of F. A. Robbins, in this issue. Mr. Robbins has been long and well known as a model maker and die sinker, and has earned his reputation by good work.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS TO DEWEY & CO.'S MINING AND SCIENTIFIC PRESS PATENT AGENCY.]

FOR THE WEEK ENDING SEPTEMBER 2D, 1879.

219,000.—TABLE WAITER—W. Beeson, Eagle Rock, Idaho Territory.

219,079.—FAUCET—D. A. Dyer, Ferndale, Cal.

8,876.—MINING APPARATUS—F. H. Fisher, Nevada, Cal. (reissue.)

219,153.—COUPLING—V. Frazee, S. F.

219,154.—REFRIGERATOR—T. Quinean, Sacramento, Cal.

219,093.—DRYING APPARATUS—E. Henderson, Portland, Oregon.

219,161.—BALANCE SLIDE VALVE—D. B. Kimmel, Idaho City, Idaho Ter.

219,283.—BRIDGE-WALL FOR FURNACES—J. Mallor, Pacheco, Cal.

219,175.—THILL COUPLING—Wm. Quinlan, Mayfield, Cal.

219,170.—AUTOMATIC GOVERNOR AND CUT-OFF ATTACHMENT—Irving M Scott, S. F.

219,122—FURNACE—J O. Stewart, S. F.

219,183—HOTEL SEWER—J. O. Tait, Stockton, Cal.

219,132.—LEACHING OUT SILVER FROM MIXED AMALGAMS—C Wilrand, Virginia City, Nev.

219,133.—DRILL SHARPENER—T. J. Williamson, Carson, Nevada.

11,392.—CAN FOR TEAS, ETC.—Design—August Schilling, S. F.

2,056.—STRASSMAN MEDICINAL WINE BITTERS—Title—Max Strassman, S. F. (label).

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

WEIGHTS OF MATERIALS.—The following shows the weight (avoirdupois) per cubic foot of various kinds of material: Average mortar, 106 pounds; water, 62½ pounds; loose earth, 95 pounds; common soil (compact), 124 pounds; clay (compact), about 130 pounds; clay with stones, 160 pounds; brick, 125 pounds; lime, 64 pounds; sand (loose), 96 pounds. And the following shows the bulk of one ton of different substances in cubic feet: Sand, 28 cubic feet; earth (compact), 18 cubic feet; earth (loose), 32 cubic feet.

NEW ELEMENT.—Herren Victor and Carl Meyer, of the Zurich Polytechnicum, have apparently succeeded in proving that chlorine is not an element, but an oxide of a new element, which they are disposed to name "Murium." The professors are still carrying out their investigations, and we may expect shortly to hear if chlorine is really an oxygen compound.

OUR AGENTS.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. L. THARP—San Francisco.
B. W. CROWELL—California.
A. O. KNOX—Pacific Coast.
S. V. BLAKESLEE—State of Nevada.
G. W. MCGREW.—Santa Clara county.
MILTON KENNEDY.—Kern and Inyo counties.
J. B. BACHELDER.—Shasta County, Cal.
H. H. MESSENGER—Arizona.

EVERY new subscriber who does not receive the paper, and every old subscriber not credited on the label, within two weeks after paying for this paper, should write personally to the publishers without delay, to secure proper credit. This is necessary to protect ourselves and subscribers against the acts and mistakes of others.

ILLUSTRATIONS BY PICTURES.—One of the great contrasts between the School Books used by the fathers and mothers of the land, when young, and those now used by the children, is the use of pictures. As a curious instance of illustrating the meaning of words by pictorial illustration, the pictures in the new edition of Webster's Unabridged Dictionary in connection with the following 12 words, Beef, Boiler, Castle, Column, Eye, Horse, Moldings, Phrenology, Ravelin, Ships, Steam Engine, Timbers, illustrate and define the meaning of more than 340 words and terms, as may be seen by examining the Dictionary.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicoo. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

HOW TO STOP THIS PAPER.—It is not a herculean task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

EXTRA COPIES can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

EXPERIMENTAL MACHINERY, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. See ad. F. W. FULLER, 415 Market St., second floor, S. F.

Chew JACKSON'S BEST Sweet Navy Tobacco

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & CO.]

SAN FRANCISCO, September 10, 3 P. M.

SILVER, 25.

GOLD BARS, 830@910. SILVER BARS, 6@16 ⅌ cent. discount.

EXCHANGE on New York, 20, on London bankers, 49½@49¾. Commercial, 50; Paris, five francs ⅌ dollar; Mexican dollars, 90½@92½.

LONDON CONSOLS, 97¾; Bonds (4%), 104¾.

QUICKSILVER in S. F., by the flask, ⅌ lb. 33½c.

GENERAL MERCHANDISE.

[WHOLESALE.]

WEDNESDAY M., September 10, 1879.

CANDLES.	
Crystal Wax	17 @—
Eagle	12 @—
Patent Sperm	30@—
CANNED GOODS.	
Assorted Pie Fruits, 2½ lb cans	2 25 @ —
Table do	3 50 @ —
Jams and Jellies	3 75 @ —
Pickles, hf gal	3 25 @ —
Sardines, qr box	1 67½@1 00
Hf Boxes	2 50 @2 75
Merry, Faull & Co's. Preserved Beef, 2 lb. doz	3 75 @4 00
do Beef, 4 lb. doz	6 50 @ —
Preserved Mutton, 2 lb. doz	3 75 @ —
Beef Tongue	6 50 @ —
Preserved Ham, 2 lb. doz	6 50 @ —
Deviled Ham, 1 lb. doz	5 50 @ —
do Ham, ½ lb doz	3 00 @ —
Boneless Pigs Feet, 3 lbs	4 50 @ —
2 lbs	3 75 @ —
Spiced Fillets, 2 lbs	4 25 @ —
Head Cheese, 2 lbs	4 25 @ —
COAL—Jobbing.	
Australian, ton	6 00 @ 6 50
Coos Bay	— @ 5 50
Bellingham Bay	@— —
Seattle	5 50 @ 6 00
Cumberland	12 00 @15 00
Mt Diablo	4 75 @ 6 00
Lehigh	11 50 @12 50
Liverpool	8 00 @ 6 50
West Hartley	— @ 8 00
Scotch	— @ 8 00
Scrantoo	— @— —
Vancouver Id	6 00 @— —
Charcoal, sack	75 @— —
Coke, bush	50 @— —
COFFEE.	
Sandwich Id, lb	@— —
Costa Rica	16 @ 16½
Guatemala	16 @ 16½
Java	25 @— 26
Manila	17 @— —
Ground, in sks	25 @— —
FISH.	
Sac'to Dry Cod	— @ 4
do in cases	5 @ 6
Eastern Cod	— 7 @— 7½
Salmon, hbls	8 00 @ 9 00
Hf bbls	5 00 @ 5 50
1 lb cans	1 10 @ 1 12½
Pkld Cod, hbls	22 00 @— —
Hf bbls	11 00 @— —
Mackerel, No. 1, Hf Bbls	9 50 @10 00
In Kits	1 85 @ 2 10
Ex Mess	3 25 @— —
Pkld Herring, hx	3 00 @ 3 50
Boston Smkd H'g	70 @— —
LIME, Etc.	
Plaster, Golden Gate Mills	3 00 @ 3 25
Land Plaster, to	10 00 @12 50
Lime, Sta Cruz, hbl	1 25 @ 1 50
Cement, Rosecdale	2 00 @ 2 25
Portland	4 00 @ 4 50
NAILS.	
Assted sizes, keg	2 70 @ 2 75

OILS.	
Pacific Glue Co's Neatsfoot, No 1	1 00 @ 90
Castor, No 1	1 35 @ —
do, No. 2	1 30 @ —
Baker's A A	1 25 @1 30
Olive, Plagniol	5 25 @5 75
Possel	4 75 @5 25
Palm, lb	9 @ —
Linseed, Raw, bbl.	78 @ —
Boiled	80 @ —
Cocoanut	55 @ —
China nut, gs	— @ 65
Sperm	1 40 @ —
Coast Whales	— @ 32½
Polar	— @ 35
Lard	— @ 70
Oleophine	22 @ 22
Devoe's Brll't	17½@ 18½
Photolite	— @ —
Nonpariel	31 @ 32½
Eureka	18 @ 42½
Barrel kerosene	20 @ —
Downer Ker	35 @ —
Elaine	37½@ —
PAINTS.	
Pure White Lead	8 @ 8½
Whiting	1½@ —
Putty	4 @ 5
Chalk	1½@ —
Paris White	2½@ —
Ochre	3½@ —
Venetian Red	3½@ —
Averill Mixed Paint, gal. White & tints	2 00 @2 40
Green, Blue & Ch Yellow	3 00 @3 50
Light Red	3 00 @3 50
Metallic Roof	1 30 @1 60
RICE.	
China, Mixed, lb	4½@ 5
Hawaiian	6 @ —
SALT.	
Cal. Bay, ton	15 00 @22 50
Common	10 00 @12 00
Carmen Id	12 00 @14 00
Liverpool fine	19 00 @— —
SOAP.	
Castile, lb	8 @ 15
Common brands	4½@ 6
Fancy brands	7 @ 8
SPICES.	
Cloves, lb	— @ 45
Cassia	19 @ 20
Nutmegs	85 @ 87½
Pepper Grain	— @ 12
Pimento	19 @ 20
Mustard, Cal., ½ lb glass	— @1 25
SUGAR, ETC.	
Cal. Cubo, lb	— @ 10½
Powdered	— @ 10½
Fine crushed	— @ 10½
Granulated	— @ 10
Golden C	— @ 8½
Cal. Syrup, kgs	70 @ —
Hawaiian Molasses	26 @ 30
TEA.	
Young Hyson, Moyune, etc	— @ 51
Country pckd Gunpowder & Imperial	— @ 42½
Hyson	30 @ 35
Fooo-Chow O	35 @ —
Japan, 1st quality	40 @ —
2d quality	20 @ 2

METALS.

[WHOLESALE.

WEDNESDAY M., September 10, 1879.

IRON.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2½@ 3½
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 7
Norway, according to thickness	6½@ 7
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @
TIN PLATES.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb, less than cask	9½@— 10
NAILS.—	
Assorted sizes	2 90@3 00

LUMBER.

WEDNESDAY M., September 10, 1879.

CARGO PRICES OF REDWOOD.

Rough, M	13 00
Refuse	9 00
Clear	23 00
Clear Refuse	13 00
Rustic	23 50
Refuse	18 00
Surfaced	20 00
Refuse	14 00
Flooring	20 00
Refuse	12 00
Beaded Flooring	23 00
Refuse	13 00
Half-inch Siding	16 00
Refuse	14 00
Half-inch Surfaced	20 00
Refuse	14 00
Half-inch Battens	16 00
Pickets, Rough	11 00
Rough, Pointed	12 50
Fancy, Pointed	18 00
Shingles	1 75

PUGET SOUND PINE

RETAIL PRICE.

Rough, M	18 00
Fencing	18 00
Flooring and Step	28 00
Narrow	30 00
2d quality	25 00
Laths	3 50
Furring, lineal ft	

REDWOOD.

RETAIL PRICE.

Rough, M	18 00
Refuse	14 00
Pickets, Rough	15 00
Pointed	16 00
Fancy	22 50
Siding	20 50
Surfaced & Long Beaded	30 00
Flooring	30 00
Refuse	22 50
Half-inch Surfaced	30 00
Rustic, No. 1	30 00
Batteus, lineal ft	
Shingles M	2 00

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending September 9, 1879.

HIGHEST AND LOWEST BAROMETER.

Sept. 3	Sept. 4	Sept. 5	Sept. 6	Sept. 7	Sept. 8	Sept. 9
30.071	30.072	30.086	30.085	30.060	30.020	29.936
30.001	30.043	30.044	30.044	29.999	29.889	29.858
MAXIMUM AND MINIMUM THERMOMETER.						
63	61	61	65	67	70	67
52	53	54	55	50	58	57
MEAN DAILY HUMIDITY.						
88	85.7	83.7	77.7	85.3	84	72
PREVAILING WIND.						
W	W	W	W	W	W	W
WIND—MILES TRAVELED.						
264	233	215	297	364	233	258
STATE OF WEATHER.						
Fair.	Cloudy	Fair.	Clear.	Fair.	Fair.	Clear.
RAINFALL IN TWENTY-FOUR HOURS.						

Total rain during the season, from July 1, 1879, 9.03 in.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Butte Hydraulic Mining Company.—Principal place of business, San Francisco, California. Location of works, Butte county, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 25th day of August, 1879, an assessment of Ten Dollars per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, Room 20, No. 328 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 29th day of September, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the 21st day of October, 1879, to pay the delinquent assessment, together with the cost of advertising and expenses of sale.

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BARTON HILL.....Acting Manager.

ROBSON & CRANE.

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THOMAS MAGUIRE.....Manager.
CHAS. H. GOODWIN.....Treasurer.
J. P. CHAPMAN.....Assistant Treasurer.

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CHAS. E. LOCKE.....Lessee and Manager

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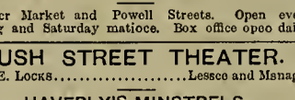

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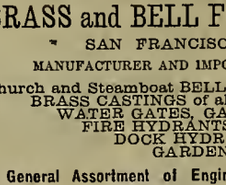

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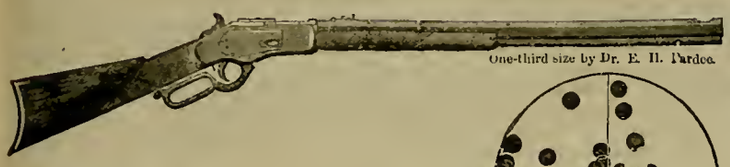

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The Impossibility of Accident in Loading,

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The San Francisco Agency is now fully supplied with all the various kinds and styles of Arms manufactured by the Winchester Repeating Arms Company, to wit:

Round barrels, plain and set, 24 inch—blued. Octagon barrel, plain, 24 inch—blued. Octagon barrel, set 24, 26, 28, 30 inch—blued. Octagon barrel, set extra heavy, 24, 26, 28, 30 inch—blued. Octagon barrel, set, 24 26, 28, 30—extra finished, case hardened and check stocks. Octagon barrel, set extra heavy, 24, 26, 28, 30 inch—extra finished—C. H. & C. S. Octagon barrel, set, 24, 26, 28, 30 inch—beautifully finished—C. H. & C. S., known as "One of One Thousand." Octagon barrel, set, gold, silver and nickel plated and engraved. Carbines blued, also gold, silver and nickel plated. Military rifle muskets, model 1873. Rifles, muskets and carbines, model 1866. RELOADING TOOLS, PRIMERS AND PARTS OF ARMS.

A heavy stock of Cartridges Manufactured by the W. R. A. Co., for all kinds of Rifles and Pistols, constantly on hand and warranted the best in the market.

Sole Agent for Dupont's Mining, Blasting, Cannon, and Celebrated Brands of Sporting Powder,

JOHN SKINKER, No. 115 Pine Street, San Francisco,

SOLE AGENT FOR THE PACIFIC COAST.

THE CALIFORNIA POWDER WORKS.

MANUFACTURERS OF

Sporting, Cannon, Mining, Blasting and

HERCULES POWDER

HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentions claims by others.

It derives its name from HERCULES, the most famous hero of Creek Mythology, who was gifted with superhuman strength. On one occasion he slew several giants who opposed him, and with one blow of his club broke a high mountain from summit to base.

No. 1 XX) is the Strongest Explosive Known.
No. 2 is superior to any powder of that grade.

PATENTED IN THE UNITED STATES PATENT OFFICE.

ORDERS RECEIVED FOR HERCULES CAPS AND FUSE.

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Office, No. 230 California Street, - - San Francisco, Cal.

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BEST REFINED CAST-STEEL.

WARRANTED MOST SUPERIOR FOR DRILLS, HAMMERS, ETC.

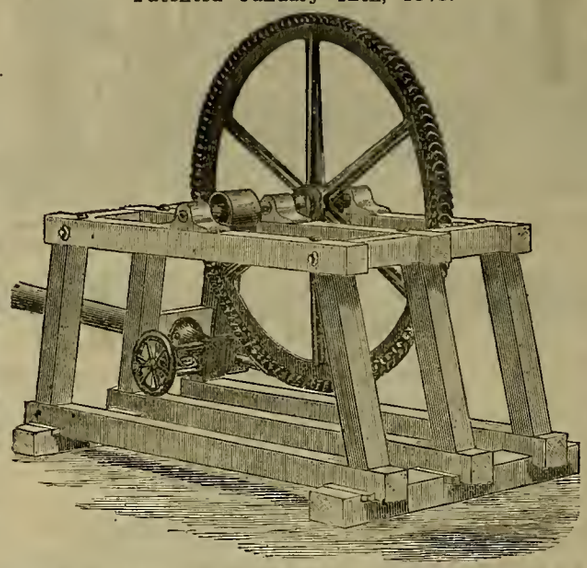
A full and complete stock of this reliable and well-known brand of Steel, for mining and other uses, now in stock, and for sale at

417 Market Street, S. F., - - H. D. Morris, Agent.

Knight's Water Wheel,

Patented January 12th, 1875.

This Wheel possesses more power for given percentage of Water than any yet offered to the public. They are in practical use in many Mills and Hoisting Works, and never fail to give entire satisfaction, which facts speak fully for their efficiency, and render further comment unnecessary.



This Wheel possesses more power for a given percentage of Water than any yet offered to the public. They are in practical use in many Mills and Hoisting Works, and never fail to give entire satisfaction, which facts speak fully for their efficiency, and render further comment unnecessary.

The KNIGHT WHEEL is used in the following named Mills and Hoisting Works, to which the Public are referred:

1-Eight-foot wheel, running Oneida Co.'s Mill, Amador county, Cal.; 60 stamps. Rob't Robinson, Supt.
1-Eight-foot wheel, running Con. Amador Mining Co.'s Mill, Amador county, Cal.; 40 stamps and two Hepburn pans. David Davis, Supt.
1-Eight-foot wheel, running Lincoln Gold Mining Co.'s Mill, Amador County, Cal.; 40 stamps.
1-Eight-foot wheel running pump at same company's mine. S. D. R. Stewart, Supt.
1-Eight-foot wheel, running Keystone Con. Mining Co.'s Mill, Amador county, Cal.; 40 stamps.
2-Four and one-half foot wheels, used in hoisting by reversible water power at same company's mine. O. C. Hewitt, Supt.
1-Four and one-half foot wheel, running Original Co.'s Mill, Amador County, Cal.; 40 stamps, one pan, one rock-breaker. J. R. Johns, Supt.
1-Four-foot wheel, running Cover Mining Co.'s new mill, Amador county, Cal.; 20 stamps.
1-Eight-foot wheel, running same company's old mill; 10 stamps. John Palmer, Supt.
1-Six-foot wheel, running Talisman Mining Co.'s Mill, Amador county, Cal.; 10 stamps.
1-Eight-foot wheel, hoisting and driving pump at same company's mine. John Tregloan, Supt.
1-Four and one-half foot wheel, running Bunker Hill Mining Co.'s Mill, Amador county, Cal.; 10 stamps. John Palmer, Supt.
1-Six-foot wheel, running St. Patrick's Mill, Newcastle, Placer county, Cal.; 15 stamps. Jno. Townsend, Supt.
1-Eight foot wheel, hoisting and running pump, compressor and hoisting at Sheba Silver Mining Co.'s mine, State of Nevada.
1-Four and one-half foot wheel, running Luck Q. M. Co.'s Mill; 10 stamps; Oregon.
1-Four and one-half foot wheel, running Republic Mill, Nevada county, Cal.; 20 stamps. E. H. Dyer, Supt.
1-Six-foot water wheel running at the Plumas Eureka Mill, Cal., 48 stamps, 2 pans, 3 ore-breakers and 22 concentrators.
1-Eight-foot water wheel running 40 stamps for the same Company. Wm. Johns, Sup't.
4-Six-foot water wheels running the Sierra Buttes Mills, Sierra Co., Cal. Wm. Johns, Sup't.
2-Six-foot and 2 four and one-half-foot wheels running Soulsby C. M. Co.'s Mills, hoisting and pumping works, Sonora, Tuolumne County, Cal. J. Leechman, Sup't.
1-Six-foot water wheel running Providence 20-stamp mill, Nevada City, Cal.
1-Four and one-half-foot wheel running DeFrees Mill, Tuscarora District, Nevada.
1-Six-foot water wheel running 20 stamps at Julian mine, Newcastle, Placer Co., Cal. A. H. Schnabel, Prop'r.
1-Six-foot water wheel running Mammoth Mill, 30 stamps and 14 pans and ore-breakers, Mammoth Lake District, Mono Co., Cal. Clark, Sup't.

☞Orders can be filled at short notice, or further information given, by addressing the undersigned.☜

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Room 20, Safe Deposit Building, San Francisco.

KNIGHT & CO.,
Sutter Creek, Amador County, Cal.

W. H. H. BOWERS & CO., Agents, Salt Lake City, Utah.

MINERAL LUBRICATING OILS.

Both Dark and Light in Color, and Gravities to Suit all Classes of Machinery.

For use in all Saw Mills, Flouring Mills, Quartz Mills, Foundries and Machine Shops, and Railroads.

Natural Dark West Virginia Lubricating Oils,

FROM 19 DEG. TO 23 DEG. GRAVITY.

LIGHT PARAFFINE LUBRICATING OILS FROM 24 DEG. TO 28 DEG. GRAVITY.

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A Full Stock of LARD OIL, SPERM OIL and other Lubricating Oils constantly on hand. Also

High Fire Test Water White Illuminating Oils,

FOR USE WHERE ABSOLUTE SAFETY IS REQUIRED.

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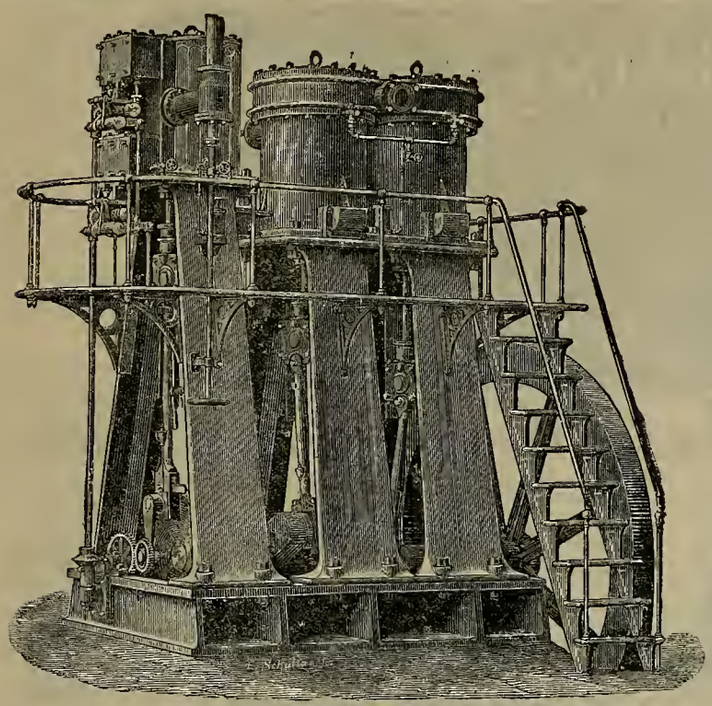
120 and 122 Front Street, - - San Francisco.

Dewey & Co. {202 Sansome St.} Patent Ag'ts | *Engraving done at this office.*



With Adjustable Cut-off Poppet Valve Engine, and Forced Iron Crank Shafts.

Mining Machinery Depot,

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NO. 7 IMPROVED

AIR COMPRESSOR.

SPECIAL ADVANTAGES.

Absolute certainty in the action of the valves at any speed. Perfect delivery of the air at any speed or pressure. The heating of the air entirely prevented at any pressure. Takes less water to cool the air than any other Compressor.

Power applied to the best advantage. Access obtainable to all the valves by removing air chest covers. Entire absence of springs or friction to open or shut the valves. No valve stems to break and drop inside of cylinders.

Have no back or front heads to break. The only Machine that makes a perfect diagram. No expensive foundations required. Absolute economy in first cost and after working.

DISPLACEMENTS in air cylinder perfect. Showing less leakage and friction than our competitors and a superior economy of about 20 per cent.

Small Sizes made in Sections not to Exceed 300 lbs.

GIANT POWDER

MANUFACTURED UNDER A. NOBEL'S ORIGINAL AND ONLY VALID NITRO-GLYCERINE PATENTS

Nos. ONE, TWO and THREE.

Stronger, Better and Safer than any other High Explosive.

Judson Powder

IS NOW USED IN ALL LARGE HYDRAULIC CLAIMS.

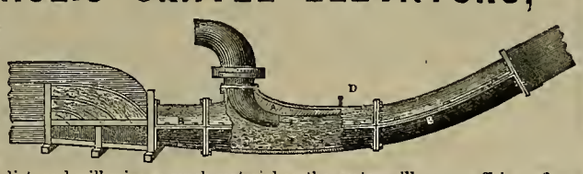
It breaks more ground, pulverizes it better, saves time and money, and is superseding the ordinary powder wherever it is tried. ☞Triple Force Caps and all Grades of Fuse.

BANDMANN, NIELSEN & CO.,

SAN FRANCISCO, CAL.

HYDRAULIC GRAVEL ELEVATORS,

For working flat gravel mines that have no dump.



Sluices gravel and water up hill on an angle of 45°, and will run any kind of gravel that will run in a flume. Handles rocks as easy as fine dirt, and will raise as much material as the water will carry off in a flume on 6 inches grade to 12 feet.

No bedrock cuts, tunnels or drains required. Machine a sufficient drain itself, and the process of mining the same as any other hydraulic mine. Is now a practical success in various places in California and Oregon. Send for descriptive circular to

JOSHUA HENDY,

No. 51 Fremont Street, Office of the Hydraulic Gravel Elevating Mining Co., S. F

VULCAN BLASTING POWDER.

The Strongest, Safest, Most Uniform and Reliable "HIGH EXPLOSIVE" Manufactured on the Coast.

MINERS TESTIFY THAT IT IS FREE FROM OBJECTIONABLE FUMES.

We call the attention of all desiring such a Powder to our various grades, which we are prepared to sell at LOWEST RATES.

No. 1.—Equalling Liquid Nitro-Glycerine in Strength. We recommend this Grade in extremely hard rock, boulders, iron, etc.

No. 2.—Will do the work thoroughly in all but the hardest kinds of rock.

No. 3.—For bench work, pipe-clay, soft and shelly rock, outside work and quarrying.

Single and Triple Force Caps, Fuse of all Gradee, Vulcan Powder Thawing Boxes, Batteriee and Exploders, For Sale at the Lowest Rates.

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This is a cheap yet complete Pulverizer and Amalgamator. It combines all the virtues of the Mexican Arastra, with every modern device, to make it thoroughly efficient, expeditious and practical. It will do more work, and do it better, than any mining machinery, for double the cost. Send for circulars, or call and see it.

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Parties having in California, where water can be had for power, a quartz lode, carrying pay ore, and sufficiently developed to warrant the erection of machinery, and are willing to give one-half of their property for such works as the mine will justify, may be benefited by addressing the undersigned. State locality of mine, size, lay, course, development, formation, surroundings, wood, water and such other particulars as will show value. Address

CLARENCE BROOKS,
328 Montgomery St., Room 20, S. F. Cal.

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Swedish Movements, The Health Lift, Spirometer or Lung Strengthener, Steam Atomizers, all Electric, Galvanic and Surgical Appliances, Sun Baths, and Solar Ray Surgery, new and perfect Truss for the Radical Cure of Hernia, lately discovered Chemical Compound for the speedy, safe, painless and permanent removal of Cancers, Scientific and successful method for the Cure of Piles, etc., etc.

☞Aime to keep Abreast with, if not in Advance of the Progressive Age.☜

It has been the mission of this System to mold public sentiment, and this Institution will hope to be no disgrace to the immortal name it has assumed. The time has come when Physicians of this School can afford financially to keep a conscience; in fact it is disastrous financially as well as morally to compromise the truth one iota; hence patients can rest assured that they will be treated by the Physicians after the most approved and scientific methods, out of pure and enlightened selfishness, recognizing the truth and beauty of this great principle:

"*The Universe is so ordered and arranged that the real and permanent good of every creature is best subserved in promoting the real and permanent good of every other being.*"

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The table will be supplied with the best the excelsior market of the world affords, embracing fruits, grains, vegetables, meats, fish, fowl, eggs, cream, etc. Regular and transient boarders will be accommodated as well as patients. Business and professional men and women who are tired of restaurant fare, may appreciate eating to live a more healthful and enjoyable life. Pure food means pure blood. Pure blood means good health.

"The vegetarian school has demonstrated beyond the possibility of a doubt that farinaceous dishes, sweet milk and fruit, are sufficient to maintain a *hard working* man in perfect health. Such a diet might certainly be substituted by sedentary people for their greasy steaks and ragouts.—*Popular Science Monthly, December, 1873.*

The Rooms are pleasant, warm, well ventilated and sunny; convenient to treatment rooms, so as to afford the best advantage of nursing and professional attendance.

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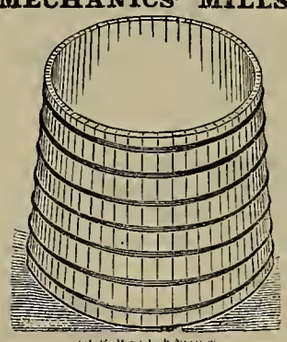
Fevers, and in fact all cases may be treated at home successfully. Paturition confinement cases are taken in the Institution or attended at home in any part of the city or country. Preparatory treatment in these cases is most important.

Testimonials of extraordinary cases and cures can be seen on application. The most desperate cases, and especially those that have been given up as incurable by the old methods, are invited. Puerperal and typhoid fever and diphtheria cases, after all other methods have failed, may be said to be a specialty. ☞Send for the TRALL HEALTH JOURNAL.

DRS. D. C. & MRS. E. D. MOORE,
Trall Hygienic Sanitarium, 8 Ellis St. S. F

MECHANICS' MILLS.



OUR WELL KNOWN

WATER TANKS,

Made by machinery, constantly on hand and made to order. PAN STAVES and OAK GUIDES a specialty.

WELLS, RUSSELL & CO.,
Mechanics' Mills, corner Mission and Fremont streets.

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PRICES REDUCED. SEND FOR NEW CATALOGUE.
CLAYTON STEAM PUMP WORKS
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N. W. SPAULDING'S

PATENT DETACHABLE TOOTH SAWS,

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SITUATION WANTED.

A competent Assayer, who has had some experience in Mill Work, desires a position with a Milling or Mining Company. The best of references. Apply to

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, SEPTEMBER 20, 1879.

VOLUME XXXIX Number 12

An Improved Pulverizer and Roller.

We illustrate herewith an improved roller and pulverizer, recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency, by George Meding, of this city. The invention is in that class of pulverizers or clod crushers which are rolled over the ground, and by that means break up the lumps and leave the soil in proper condition for sowing seed.

To the frame of the roller is attached a pole for the horses, and in the rear is a seat for the driver, as shown in the engraving. The axle is fixed to the frame and does not revolve.

On the axle is mounted the rollers, which may be made in two parts, with a bar between them for giving center support to the axle. These rollers are formed of four-sided bars, secured in a circle to the edge of the wheels. The bars are so placed that their edges are outward and strike the ground, so as to more effectually cut up the clods or lumps. Rods extend across between the ends of the rollers, inside, for strengthening, and are set up by nuts, so as to keep the crushing bars in position. By unscrewing these rods the wheels may be separated, so that the four-sided bars may be turned and bring new edges outside. When, however, the inside binding rods are screwed up the bars cannot be turned, and their sharp edges are kept in proper position. The pulverizing bars are secured in position in the wheels by square countersunk holes being made in the wheels. As these holes are not made through the wheels the bars cannot move endwise when the binding rods are screwed up, and the shape of the holes in the wheels is such that they cannot rotate.

Rollers made in this manner are much more effective as clod crushers or pulverizers than those of ordinary construction. The sharp edges of the bars cut or break the clods without pressing them into the ground. Such pieces or lumps as pass through the interstices between the bars are rolled over and over again until fine enough to pass out again. When the edges of the bars become dull they can be turned, so that fresh edges are presented. In this way each bar can be turned four times before needing renewal.

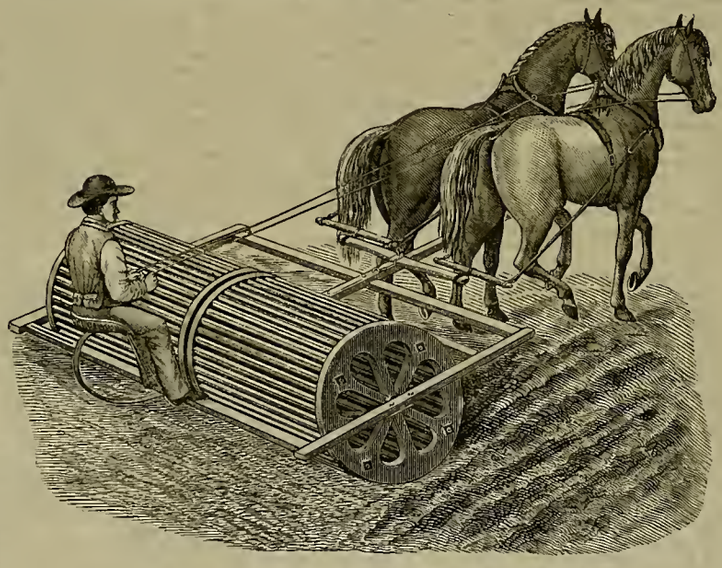
Rollers of this kind can be made comparatively light, and be easier on the draft animals than the heavy plank rollers, while at the same time, from their peculiar construction, they are very much more effective than those of ordinary construction. Each pair of wheels for each roller, when there are two, revolves independently on the shaft so as to facilitate turning. The wheels may be made open at the sides as shown, for lightness and facility of construction.

In order to give the roller the best possible effect, and make the edges of the bars last as long as possible, the inventor prefers to make them with concave sides. This produces a thinner, and more cutting and effective edge; and these bars may be rolled as cheaply as any other form by having rolls provided for the purpose. Mr. Meding has had this pulverizer in practical use for some time, and finds it to answer the requirements perfectly. It leaves the ground well pulverized and smooth, ready for seeding.

This roller will work where no other can, except when the soil is too wet. It will crush the clods, even when dry, and in that way enable the farmer to get his summer-fallowed ground pulverized; and when used after sowing, will leave the ground smooth, which will save much on his machinery and horses when harvesting is going on. Its use will enable the hay-rake to rake clean, and no clods will be found in the hay. The roller will not only be valuable on strong clay or adobe land, but even on light soil it will prove efficient, since it is heavy, and by putting more weight on it can be made heavier, if desired. The mark this roller leaves after it is something like the marks of a very fine harrow, which is considered, by some, better than a perfectly smooth surface. The rays of the sun will not come perpendicular on the surface. If necessary to break the crust formed after a rain, by rolling over again crossway the earth will be easily pulverized. If the roller is not wanted on it, a comparatively light harrow will pulverize it by harrowing the same way it is rolled, the harrow coming across the small "combs" and breaking the crust, without working too deep in the ground. Rolled after the field is sowed, these small "combs" will give a kind of protection and lee to the young sprout when it first peeps out on the surface.

The roller can be made of any size or length, if desired. One of them in use is 8 feet long, and the cylinder is 36 inches in diameter, and will weigh over 1,600 pounds. Most of the weight is in the rollers, and nothing else than the driver and the frame is weighing down on the axle, which renders it comparatively light for two horses.

The patent right is for sale, or contracts for making the roller can be obtained by applying to the inventor, George Meding, at Reading, Shasta county, Cal.



MEDING'S IMPROVED ROLLER AND PULVERIZER.

MINING INTERESTS IN NEW YORK.—The efforts made in the East to develop the mining business are certainly an indication of the growing importance of mines as an investment. We are hardly prepared to say that mining stocks will usurp the position railroad, coal mine and other stocks have hitherto held in the East, although the former are gaining ground daily. There is something more solid and substantial about a paying gold or silver mine, and the fluctuations of value are less than in any other investment. It is now proposed to establish a miner's bank at New York, which will advance money on good prospective or dividend-paying mining stocks at nine per cent., and to secure the same facilities and case of trading in mining stocks as can be got on railroad and other securities listed at the N. Y. Stock Exchange. It is claimed that no speculation of any account in mining stocks can be looked for until this advantage is offered the public.

CALIFORNIA MINING NEWS.—We are in receipt of inquiries concerning the development of the mineral resources of our State of a more detailed character than we can gather from some of our exchanges. Indeed, we are obliged to rely for news from many localities upon correspondents. We would be glad to receive reports from every county, and solicit from all reliable facts about the mining business, which at the present time is being so rapidly developed. New discoveries are being made, and new methods tried. We desire to afford scope in our columns for whatever information may be of interest to the readers of a mining and scientific journal. Let all who are interested in removing the imputation of California mines being exhausted write us, and we will give due credit.

Assessable and Non-assessable Stock.

The New York *Mining Record*, in contrasting the two systems, favors the assessment system of mining stocks. Mining incorporations organized under the laws of Colorado and New York are not legally subject to assessment, while in California and Nevada the assessment plan seems to be regarded as the only practical method. Complaints are loud against the non-assessable stock system, because of its danger to the interests of small investors. There is no doubt that mining, as a rule, requires constant outlay for development, dead work and machinery. This development fund in the non-assessable system is created by the sale of what is known as the working-capital stock, to effect which every effort is made to get out ore enough to enable the managers to declare a dividend. In the case of the Flagstaff mining company, of Utah, reported in a former number of this paper, money was borrowed on the strength of the ore in sight and used in paying dividends. This before any work was done to place the mine on a permanent industrial basis.

This is distasteful to the *Mining Record*, inasmuch as foreclosure is generally a speedy result, sacrificing the most of the stockholders, and says a good word for our system by advising its readers that, "under every aspect we must regard the system of assessable shares the safest for investors, and the other system as fraught with hazard of loss of every dollar invested in that way. Therefore, we cannot hesitate to counsel our friends to organize their mining ventures, whenever practicable, only under the laws of a State that authorize and regulate assessments. Having thus provided for the mutual ready support and equal contribution of means for the prosecution of the enterprise by all the shareholders according to their respective interests, let care be taken to select men of unblemished business standing for the management, and we conscientiously believe the larger part of the mining schemes now before the public offer more certainty of profitable outcome upon the money invested in them than in any other industrial undertakings."

THE Massachusetts State Greenhackers at Boston have nominated Gen. B. F. Butler for Governor and Wendell Phillips for Lieutenant Governor.

THE loss of cotton in Louisiana and Mississippi from the late storms is placed at 250,000 bales, and of sugar in the former State at 50,000 hogsheads.

A RICH vein of silver is said to have been discovered at Meredith, N. H.

Oil from Shales.

An important industry has sprung up in Scotland, which is of some practical benefit in this country, where the crude material exists in large quantities. It is the production of naphtha, paraffine and ammonia from shale. As far back as 1848, James Young had a small petroleum spring which was met with in a colliery at Alfreton, in Derbyshire, and when that became exhausted he endeavored to obtain the same oils by distilling coal. After many trials he was fortunate in meeting with what may now be termed the famous Boghead Cannel, so well known for its richness in oil.

Some shale bears a strong affinity to coal, which fact led to a celebrated trial at Edinburgh in 1853, in which the most eminent chemists, mineralogists and geologists could not agree upon the question as to whether shale was coal or not. Some coal, such as that known as "Curly Cannel" peculiar to the Mold district, in North Wales, gives a large percentage of oil, and at one time was extensively distilled. Some other shales are also rich in oil, and at Barnstaple, far away from any coal field, a bed of shale, highly impregnated with oil, was found while digging some foundations. It was found traversing the upper devonian shale, but it is met with most extensively in connection with the coal measures.

The oil is in great demand, and the price is such as to leave a good profit, if we are to judge by the dividends paid by one company and the vast sums made by a few individuals, who have had something like a monopoly of the manufacture since it was first commenced. The value of solid paraffine is considerable, and with respect to it, Liebig, the great chemist, said if anyone succeeded in producing it from coal it would be one of the greatest discoveries of the age. This has been accomplished, and from shale is obtained a white, dry, odorless substance, portable, and capable of being burned in a lamp. Amongst the various works in Scotland nearly 800,000 tons of shale are distilled annually, producing nearly 30,000,000 gallons of crude oil, from which about 12,000,000 gallons of refined oil are obtained, in addition to large quantities of naphtha, solid paraffine, ammonia, and other chemical products.

Our own immense supply of petroleum may not, perhaps, justify the distillation of coal to obtain products which are obtained from petroleum. Every refinery turns out enormous quantities of paraffine, both hard and soft, which is easily and cheaply refined by the Byerley process, one refinery in Cleveland, Ohio, alone turning out from 12 to 20 tons of solid paraffine per day, about 3 tons of which is soft and used for chewing gum. The oil from shales is both colorless and without odor, and this alone may be an inducement. The expense of refining petroleum oil is considerable, notwithstanding its enormous quantity, and it requires considerable handling. Whether the distillation of coal would enable us to obtain a cheaper product is possible, for we are now paying more for a gallon of refined oil than for a *barrel* of crude. Coming into use largely for cooking, we need a cheap, odorless oil. Our resources on this coast, in the way of oil productions, are large, and we certainly ought to be independent of the tin cans sent us from the East at a high price.

TUCSON NOTES.—Capt. W. H. Seamane informs us that the city of Tucson has now a population of some seven or eight thousand, three-fourths of whom are Mexicans. A large increase is expected as soon as the weather becomes cooler. Tombstone is a very active camp, and is rapidly increasing in population. Some persons claim that a large town will grow up there, but it is predicted that the "boss" town will be located near the San Pedro river, fifty or sixty miles east of Tucson, where the S. P. R. R. will cross that stream. The advent of the locomotive is expected before the first of December next.

CONNECTION has been made between the Union and Sierra Nevada mines.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Grantsville, Nevada.

EDITORS PRESS:—From Austin, south, up the wide, even, regular valley of Reese river, some 65 miles, with lofty, rugged ranges of mountaine on each side, and the traveler turns over a moderate divide to the west to enter a new, small mining village called Grantsville. It occupies a beautiful nook for a site, surrounded by towering, craggy-crowned hills, with a rocky canyon outlet to the west. It has just room enough for a good town, with water and wood sufficient for all necessary uses. Here are large mines, of late development, very rich in silver and gold, sure of permanence, and worthy to be classed among the first in the State of Nevada.

The principal claim is that of the Alexander, a union of three old ones, yielding only silver and running along near the crest of a precipitous, rocky mountain, most easily to be got at and worked. The ore is the chloride, so soft as rarely to need blasting, with no waste rock, and averaging between $30 and $40 to the ton. The vein is an enormous one, surpassing at the point of practical development, anything we have elsewhere seen. It has been opened along the distinct footwall near 600 feet, but only at one point has the effort been made to work fully across it. At this point the superintendent, Mr. San Pedro, and the foreman, Mr. Murphy, conducted us from the footwall 300 feet to what was the day before struck as the supposed hanging wall; but the morning's workman said no, this is only a little shaling in the vein, for at the bottom it is broken through, and the vein yet extends further. We examined, and such was the case; the vein was not yet cut the full width. For this 300 feet there had not appeared one foot of waste rock. This vein is traced by its croppings, and claimed three or four miles, but it is nowhere else opened by regular work.

An excellent 20-stamp dry-crushing and roasting mill is connected with this claim, to which the ore is brought at the small expense of 10c a ton, so conveniently is everything arranged. This mill seems admirably managed under the careful, efficient direction of an experienced foreman, Mr. Thos. Mitchel, formerly of Belmont and Austin.

Everything in connection with the building of this mill and the opening of this mine has been done in two years, without assessment or outside investment, except from the sale of a part of the working capital at first set aside, all expenses being met by returns from the mine itself.

Besides this great Alexander vein there are also other parallel, distinct veins of different character of rock, of which the main one is some 700 feet west. Its principal claim is the Lloyd, opened 60 feet deep, of very hard quartz, and bearing twice the value of gold it does of silver. The vein is 4½ feet thick, and assays immensely rich, much of it from $300 to $500 the ton, with no real waste rock.

It is but two years since work was successfully commenced at this point. Yet a New York company had once, some twelve years ago, purchased the claim here and run tunnels to develop the vein. The upper tunnel was 800 feet long, beginning in a slight bend of the footwall, so that they soon lost the vein itself, and then ran parallel with it the whole 800 feet—never over two feet from it, and sometimes but six inches. Then becoming discouraged, all was entirely abandoned till two years ago, when Mr. San Pedro, with a company, began work, and struck the true immense lead, with the results described. But we may not delay too long on one account.

North of Grantsville, in the same range nine miles, is the once prosperous mining town of Ione, with its many once rich-paying veins.

Again, 12 miles across the smooth valley to the west, is another older mining town called Ellsworth, once flourishing, but now very still. Yet, surely, from all we could learn, there are here claims which have not only been worked with rich returns, but in a manner for immediate yields; which, with proper treatment in view of permanence, must become again of immense value. Let men of capital turn their attention to these mines, and they may be largely rewarded.

Again, over the mighty range to the west, across another valley, some eleven miles in all, is a fine mill and claim, with a village called Lodi. The claim is known as the Illinois. This has been a rich, fine, good yielding claim under the successful superintendence of Mr. Kirkpatrick, but some company difficulty has caused a suspension of the smelting furnace since the 25th of last December. It is expected that this claim will again be yelding its full quota of silver in the course of weeks or months; it is not certain how soon.

Eight miles south of here, across the valley which here suddenly bends, thus taking one back to the east side, is the new town of Downieville. Here very fine galena silver leads were struck two years since, and have been developing nearly as largely and richly as those of Eureka.

The character of the ore and the peculiarities of the mine are almost exactly the same in both places, and we see no reasons why, with capital, this place might not become second Eureka. The principal vein has been worked in the two years over 600 feet deep, by band-windlass alone, and there seems no question as to its size and richness.

This hand-work along the irregular lead, as all such leads in lime are, has been very expensive, requiring seven successive windlasses from the bottom up. Now a perpendicular shaft, with hoisting works is needed, and the whole enterprise must move off easily and with good returns.

Mr. A. J. Howk, the enterprising merchant of this place and of Ellsworth, is, we understand, now at the Bay to secure the needed funds for this purpose, and we wish to add every encouragement to the effort, believing it must be a good investment.

But from here, 20 miles west to Hot Springs, then near 50 miles south to New Boston, through a grand region of wide valleys and wonderful mountains, especially along under the Volcano range, there are no mines developed, though scores of them are spoken of as claimed and partially prospected.

But at New Boston is a fine crushing and roasting mill, reducing the ore from two or three fine mines, all under the ownership of Mr. A. I. Rhodes & Co. Water is brought in iron pipes four miles across the valley from the east, sufficient for all purposes, and a pleasant, new town is springing up in regular and good shape. From all accounts this is an enterprise of excellent promise, already yielding good returns above all expenses, and promising largely for the future. The more we see and learn of the mineral resources of Nevada, the more we are surprised at their numerous, extended and immense developments, and believe that not one-twentieth part are yet thought of, but for a thousand years to come, they will be more and more constantly unfolding. S. V. B.

Globe City, Globe District, A. T.

EDITORS PRESS:—Having been stopping in this district for several months, I thought I might be able to give the public some information in regard to the mining interests here. I will merely state what I have learned by personal examination, since my arrival, and must say that I am surprised, for from what information I could gather at San Francisco and thereabouts, I expected to find a camp in which the bottom lay very close to the surface, and of course, if I found a shaft of any great depth, to find the bottom not so rich. I took great pains to satisfy myself as to the permanency of the ledge, also the amount and quality of the ore in the bottom, and as yet, I have got to find the first one that did not have a better showing in the bottom than on the surface. Then another thing I have noticed is the length of the ledges, many of them traceable for several miles in length, and the croppings showing great width. I have been forced to believe that deep mining will bring to the surface large quantities of pay ore, as the surface I think has produced as rich ore as any camp discovered. I could, if space would allow, cite to you several claims whose records are second to none yet discovered on this coast, but as most are conversant with the facts, I'll forbear repetition and will try and show other features, which I think ought to be mentioned, that is our large amounts of what is called second class ore, ranging say from 80 to 150 ounces per ton, which at the present time is almost useless to the parties who have taken it out, and own the claims it came from. In many cases this ore was what was left from the sorting, the assorted paying in the thousands, and in several it being the quality coming from the ledge, and in such cases I think it would mill better figures than I have placed it at. Now to the reason of the accumulation of this ore, and we find the miners all say that it runs us in debt to take it out, and have it milled at the prices we have to pay and the per cent. we get in return; so they had rather let it lie until they either find a purchaser or it can be worked, and they come out even or ahead. That would of course start them to developing, as most of them have invested their all in these prospects, and have had to quit until something of that kind should be started. I find that a great many of these men would dispose, if they could, some of their best property at a reasonable price, in order to get money to develop their other prospects; and as a general thing, the most of this property has a good showing, with shafts from 50 to 150 feet deep, and good ore from the top to the bottom of shaft, and, in most cases, quite a quantity on the dump; in most of the deep shafts levels have been run and good ore found. So, taking it as a whole, I see no reason why such property (if handled properly) would not be a good investment, providing the parties buying would work the ore with their own reduction works, managed by competent men, and that is what has been the great trouble here. Men have been placed in positions requiring men of experience, that perhaps had never been in a quartz mill before, and the result is the parties interested have got disgusted and quit, and think the country is good for nothing. On this point I could cite you to several cases, and my advice to those parties is, send down competent, well-informed mining men, who understand taking out and reducing ore, and then I think they will have a better feeling towards this country, and perhaps regain what they have lost and reap a benefit besides. From what I can learn by observation, there has been sent to this country a lot of men, who, it seems, were good for nothing at anything, and so, to get rid of them, shipped them to Arizona to spend their money in trying to learn mining without a teacher; and because it proved a failure in most cases, they say, "no use going there—nothing in it." Having shown you how a few things have been operated, I will say a few words regarding facilities for reduction works. These are, as a matter of course, unusually scarce, still I find that plenty can be had near most of the mines. I hardly think ore would have to be hauled to exceed two miles at the farthest; wood can be bought anywhere in the district at $5 per cord; labor at your own prices at the present time. So, taking it altogether, I see no reason why ore should not be worked here at a very reasonable price; and as a large per cent. of our ore is free milling and quite a considerable carries free gold, I am at a loss to know why this camp should not command the attention of some of the mining men of the Pacific coast; and I think when it does have a fair and impartial trial, that there will be brought to light things that will be enticing to all who have capital to invest. MINER.

Sept. 6th, 1879.

The High Sierras.

EDITORS PRESS:—We had been having a prolonged spell of extremely hot weather, and wife, baby and I, to get away from it, started for our eastward horizon of snow, the high Sierras. The ascent of the mountain is made by an excellent wagon road, constructed for hauling lumber from the four large mills, which, from the immense mountain forests, have supplied our valley with lumber.

Our first half day of mountain travel took us to an altitude of some 6,000 feet; here at Stevenson's dairy ranch, a beautiful meadow of green native grass, surrounded by a dense, untouched forest, mostly of the larch timber (*Larix Americana*), we spent our first night in the mountains. The next day, five hours' travel, 15 miles in an easterly direction, over altitudes varying from 5,000 to 7,000 feet, took us, to the end of all the wagon road here on the mountains, to Dusy's sheep ranch on Dinkey creek. Mr. Dusy is one of the pioneers of this county. He is one of our county's most successful sheep men. His thousands of sheep find abundant, excellent summer pasturage under his personal supervision and direction, in the numerous small mountain meadows along the headwaters of King's river. He is an artist and has taken numerous views of the most noted and picturesque scenery in the mountains. His family spends a portion of their summer at Dinkey creek. Here I left wife and baby and started out for a day's botanizing. I went eastward a dozen miles across Dinkey and up the North Fork of King's river; then I went northward to an altitude of between 800 and 900 feet.

Dusy's Grove of Big Trees.

Many persons speak and write of the "Big Trees," as though there were but a single grove. The truth is, there are about a dozen groves of them. I had before seen over a half dozen groves in Tulare county; the Mariposa grove, the Calaveras grove, and now we were to visit Dusy's grove, one of the two noted groves that I'd not yet seen, the other being further north on the head of Fresno river.

This grove of sequoias is about four miles down Dinkey creek from Mr. Dusy's place, is on the opposite side from Mr. D.'s, and about a half a mile from Dinkey creek, and I should think nearly a thousand feet higher than the creek, which here runs in a canyon.

There are over 100 trees (my estimate) in the grove. The smallest, a foot in hight, we brought away. The largest, named Gen. Washington, by Mr. Dusy, the discoverer, is nearly half burned away at the butt, but it shows an original diameter of 44 feet at the surface of the ground. Some of the trees of a diameter from 20 to 25 feet, are the most symmetrical of all sequoias that I have ever seen. They show a scarcely varying uniformity in size of trunk for a hight of over 100 feet.

Vandalism.

This sub-head may sound harsh, but no milder one will express the way that some of these trees have been mutilated. There is an abundance of bark and wood obtainable from fallen trees; this ought to suffice; but it does not. Visitors have mutilated some of the finest trees in the grove for relics to carry away. I believe that, had the body of Washington, the revered "Father of our Country," been embalmed, so that we could look upon his features as in life, there are people who would not be content without breaking off a piece of an ear or digging out an eye to carry off as mementoes of their visit to his tomb.

This ought to be stopped. One of these forest giants must soon yield its life to the rapacity of these relic hunters. But that is not the end. Other trees will follow in disfigurement and destruction, as the number of visitors increases, until all will be deformed and dead; victims to a practice which, by statute, ought to be made criminal.

Hospitality.

During the last dozen years a great number of tourists have visited this grove. Mr. Dusy has furnished *free* use of inclosed pastures to the many hundreds of horses that have been ridden, and driven by these excursionists. I asked him if he intended for future years to bestow a like favor *gratis to all visitors to the grove.* "Yes," said he, "tell everybody to come, while I'm proprietor here; in the future as in the past, no visitors to the grove will be charged for pasturage of work animals."

He then related circumstances pertaining to visits of different tourists. Notably among them John Muir, who made this his starting point on that long trip of extensive explorations in this "Switzerland of America."

Fresno, Cal. W. A. SANDERS.

Coal Mines in China.

The *Shen Pao* publishes a report on some coal mines in the neighborhood of Ching-men-Chow, not far from Ichang. The report is written by a mandarin who was sent to make an inspection, and was evidently accompanied by a foreign expert. Boring operations, says the report, were commenced late last autumn. The coal-producing country appears to cover an extent of 75 square English miles, 15 long by five broad. There are ten layers of coal one above the other. The bed in Wotzukow is estimated to be 500 English acres; that at San-li-kang to be one-fourth its size. It is supposed that 1,200,000 tons of coal can be raised from Wotzukow, and 800,000 from San-li-kang, at the rate of 40,000 tons a year. The supply thus would last at least 40 years. It is highly probable that further explorations will bring to light fresh beds, as these discoveries are the result of merely the first investigations. It should be mentioned that a few small mines have been opened by the people living in the district, but they have not penetrated to the level of the best coal or largest seams. The bed at Wotzukow is 100 feet below the surface. The coal is just the same as the best American anthracite that is brought to China. Anthracite is a most useful kind of coal, being free from sulphur and without any impurities. It gives out great heat and can be used economically and successfully for smelting iron or other metals. It is also suitable for use on board steamers, particularly when mixed with soft coal. As affording much heat, with but little smoke, it commands a high price for household purposes. A small proportion only of the coal throughout the world is good enough for smelting, and any foreign country possessing coal of as good quality as that at Wotzukow, would be content to carry it hundreds of miles to its smelting furnaces. Specimens of this and of all the native and foreign coal procurable in China have been analyzed together, and the new coal has shown itself superior to all for smelting purposes. The province of Hupei possesses several mines containing iron of excellent quality. If these are worked in connection with the coal mines, large profits should be obtained, and if the example be followed in other provinces, a source of wealth to the whole country will be opened up.

BELT LACING.—A mill-owner says: "Eel-skine make the best possible strings for lacing belts. One lace will outlast any belt, and will stand wear and hard usage where books or any other fastenings fail. Our mill being on the bank of the river, we keep a net set for eels, which, when wanted, are taken out in the morning and skinned, and the skins are stuck on a smooth board. When dry, we cut them in two strings, making the eel-skin, in three hours from the time the fish is taken from the water, travel in a belt."

DRILLING GLASS.—Take a common drill, run a little fast; do not press on, the weight of the drill-press is enough. Drill from both sides, keeping the glass and drill wet with turpentine. Be very careful when the two holes meet, not to let the drill catch. After a hole is made large enough for a small round file, file to the desired size, keeping the file and glass wet with turpentine.

LABOR-SAVING JIGS.—Where great quantities of slate are found in veins of anthracite coal, and the slate is hard and heavy, a jig or separator is now used to separate the slate from the coal. This used to be done by children. A superior jig has been adopted from an old German machine, in which a powerful plunger is used to agitate the water instead of the lifting process which is applied to all others.

BENZOLE AND BENZINE.—Benzole and benzine have been generally regarded as synonymous, but certain pharmaceutical works now apply the term benzine to a light petroleum product. True benzole is soluble in half to three quarters of its weight of alcohol, while the petroleum spirit requires six times its weight.—*Exchange.*

CLEANING BOTTLES THAT HAVE CONTAINED ESSENTIAL OIL.—The handiest way is to put a little powdered bichromate of potash in the bottle, then as much in bulk of concentrated sulphuric acid. Let it run well round, and then let it stand till the organic particles are carbonized or turned black. Add a little water, shake well, and rinse out.

A PNEUMATIC DISPATCH TUBE.—Shavings from a planing mill in Chicago are, by an air-blast, blown 700 feet, through a 15-inch sheet iron pipe, to a distillery, where they are burned for fuel.

MECHANICAL PROGRESS.

Pitch of Tuning Forks.

An optical method has been devised in England for determining the absolute pitch of tuning-forks. The fork vibrates in front of a rotating drum, whose periphery is marked with dots or fine lines at regular intervals. A microscope is so arranged as to comprise in its field of vision the edge of the fork, and several of the intervals upon the drum. When the drum revolves at such a rate that the speed of an interval equals the period of the fork, a set of waves or prominences, in width equal to an interval, becomes visible. A Kœnig fork, giving 256 vibrations per second, correct at 16.1° C., was tested, and gave 256.2966. Frequent bowing did not alter the phase; but fixing the fork rigidly, as in a vise, did so. The temperature co-efficient for Kœnig's forks (0.00011 for each degree Centigrade) was confirmed by these tests. Forks of different octaves were compared; audible beats could be counted; and modifications of Lesage's figures seen. The time in this experiment was got by an electric clock, designed by Prof. McLeod, which is described as follows: A zinc and steel compensating pendulum, moved by its own gravity; but at each beat made and broke a battery-circuit, by means of two bent springs, one on each side. The current passing through an electro-magnet, detained a bent lever until the pendulum swung to the other contact. By this contrivance time was marked. The platinum contacts frequently struck together; but a liquid shunt of dilute sulphuric acid destroyed the extra current and remedied that defect.

SELF-LAYING TRAMWAY.—A vehicle was on exhibition at the recent Royal Agricultural show, which excited considerable attention from the fact that it was a road-car carrying its own rails or trams and laying them as it moved. The tramway is composed of plates of hard wood, faced and strengthened with metal, and attached to two parallel endless chains, which pass round revolving guides or drums at the ends of the vehicle, and both over and under the wheels. The chief points in which this arrangement differs from others of a similar character are the gain of a fixed rail without loss of power by friction, the endless chain of plates resting on the top of the van wheels, and being carried forward by them. In this way a free and noiseless action is secured. The under carriages, constructed on the bogie principle, lock simultaneously, thus causing the front and hind wheels to run in the same track, and also enabling the vehicle to turn a very sharp corner. The shafts, however, can be fixed at either end, so as to avoid the necessity for turning in narrow or inconvenient places. The body of the vehicle projects over the wheels, thus giving an increased capacity of over 30%. A light four-wheeled van, fitted with this apparatus, and loaded up to one ton weight, may easily be drawn by one man; and over very heavy or plowed land, the gain is proportionally greater. In this latter case the plates of the endless chains are constructed of a sufficient width to well cover furrows or ruts. The first two vehicles that were constructed under this patent were a farm wagon capable of carrying from seven to eight tons, and a vehicle for goods or passengers, suitable for high speed.

THE MELODIOGRAPH.—Several contrivances have been invented to record the notes of melodies played on a piano, organ, or other key instrument, but were all more or less useless on account of their complexity, imperfectness, or expense. Zigliani's melodiograph is very simple, usable and cheap. A double flat spring placed under each key is connected with a battery and with a recording apparatus, which consists of a comb provided with insulated teeth gently resting on a copper cylinder. A strip of ruled and chemically prepared paper is drawn over this roller by a clock-work, and receives the impressions or marks of the teeth of the comb. This clockwork can be regulated so as to cause the paper to move in conformity with the time kept by a person playing the instrument. Every time a key is depressed the circuit is closed, and the electricity, passing through one of the teeth of the comb, makes a mark corresponding to the key that has been depressed.

A CHEMICAL CLOCK.—There is a clock in the Guildhall Museum, London, of which the motive power is hydrogen gas, generated by the action of diluted sulphuric acid on a ball of zinc. The clock itself resembles a large colored glass cylinder without a cover, and is about half full of sulphuric acid. Floating on the top of this acid is a glass bell, and the gas generated forces upward this concave receiver until it nearly reaches the top of the cylinder, when, by the action of a delicate lever, two valves become simultaneously opened. One of these allows the gas to escape, thereby causing the receiver to descend, and the other permits a fresh ball of zinc to fall into the acid. The same operation is repeated as long as the materials for making the gas are supplied, and this is effected without winding or manipulation of any kind. The final plate is fixed to the front of the cylinder, and communicates by wheels, etc., with a small glass perpendicular shaft, which rises with the receiver and sets the wheels in motion.

A HOME-MADE DANIELL BATTERY.—The London *Electrician* gives the following directions for making a Daniell cell: Select a small round earthenware jar, such as is used for keeplug preserves, and, having lined the bottom with gutta-percha, or some suitable cement, to the depth of one-quarter inch, fix upright in this a rod of zinc, of equal hight with the jar, to which a length of copper wire has been attached by passing it through a hole drilled in the upper part of the zinc rod, or by soldering. Make a cylinder of pipe-clay, or other porous clay, larger than the zinc rod, and having dried it, make it hot in the fire by degrees, till it attains a red heat. Let this cylinder cool gently, and when cold place it in the jar round the center rod, encircling it at a little distance. By moderately heating the end of the cylinder, it will, when placed on the gutta-percha, make a groove which will fix the tube and prevent infiltration of the fluids. Line the inside of the jar with a plate of thin copper bent into a cylindrical form and having a few holes punched in it, through which may be threaded the extremity of another length of copper wire. On the top of this cylinder place a flat ring of copper pierced with holes, and nearly, but not quite, touching the porous cylinder. This forms the battery. To charge it, a saturated solution of sulphate of copper is poured between the copper and the clay tube, and some crystals of the same salt are placed upon the perforated ring so as just to be in contact with the solution. The zinc compartment is then to be filled with a solution of sulphate of zinc, sal-ammoniac, or common salt.

POLYMETER FOR GRADING RAILWAYS.—The apparatus generally used for testing the distance between the rails and the super-elevation is merely an iron bar with two lugs or gauges—on which a mason's level is placed—and a notched rule, which, of course, must be horizontal. To secure greater accuracy in both these operations, M. Couturier has invented his polymeter, which consists of an iron triangular rule about 6½ feet in length, having the long side for its base, furnished with a movable arm which is pressed against the rail by a spring. The arm communicates with a pointer, which stands at the zero of a finely divided scale when the rails are at their nominal width apart, 1.447 meters (4 feet 8½ inches); for instance, any deviation from this, more or less, being indicated on the scale. At the side a pendulum is attached to the ruler, which, when vertical, points to the zero of a circular scale; any change in the inclination of the ruler is communicated to an index sufficiently long to reproduce on the scale the actual amount of the super-elevation of the rail; this communication can be made either by a toothed wheel or by a series of links from the pendulum to the index. This second part can, if necessary, be detached from the ruler and placed in a box, which could then be laid upon the ordinary gauging bar. It is fitted with a glass covering to protect it from dust and from injury at the hands of the plate layers.—*Abstract of a paper in Bi-mensuel de la Societe d'Encouragement, 1878.*

CURING BEEF BY INJECTING BRINE.—The infiltration system of salting beef, by filling the blood-vessels with brine, is attracting considerable attention in Australia. In some recent experiments at Brisbane, bullocks were treated as follows: At the instant of killing, the animal's heart was laid bare, and incisions were made in both ventricles. Into the orifice of the left ventricle a pipe was inserted, and a stream of weak brine was forced through the blood-vessels, washing out all the blood. Pressure was obtained by having the brine in an elevated tank. After the expulsion of the blood, the right ventricle was closed by a clamp, and stronger brine was forced in until all the blood-vessels were full. In this way the distribution of the brine through every part of the meat is said to be complete and the curing perfect. It is proposed to send to the Sydney exhibition a whole bullock thus preserved.—*Scientific American.*

NEW RAILROAD TIE.—A new iron railroad tie recently exhibited at Philadelphia dispenses with the use of spikes, bolts, nuts, or fish plates, and with the drilling and punching of rails, and avoids the consequent dangers of weakening or fracture from such causes. The mode of attachment is by means of a recess, with which each tie is provided, along the bottom of which recess wedge-shaped transverse pieces are cast. At the side of the recesses are two creosoted blocks of wood, which form a cushion and a fulcrum for two clamps, which grasp the flange and web of the rail above, bearing upon opposite faces of the wedge below. By this device the weight of the train increases the grip of the clamps. The first cost of this tie is greater than that of the wooden tie, but it is claimed that this is more than offset by its much greater durability.

INDIA-RUBBER TIRES.—A gentleman read a paper before the recent meeting of the Institution of Mechanical Engineers at Glasgow, in which he claimed that the rubber tires used on the traction engines of India were of great service in reducing the cost of the ordinary engine repairs, and in giving uniformity of adhesion, without damaging the surface of the roads. The cost of the tires did not exceed 1½d. per mile. The manager of the Glasgow tramways stated that the engines used by him were provided with rubber tires, without which they would be unable to secure sufficient adhesion to enable them to do their work.

SCIENTIFIC PROGRESS.

Edison's Discovery.

Mr. Edison has not yet revealed any additions to his knowledge of the use of electricity for illumination, but his paper on the treatment of platinum wire, read at the session of the American Association for the Advancement of Science at Saratoga, is almost as interesting as a discussion of the electric light would have been. Platinum, made incandescent by a hydrogen flame or by an electric current, wastes away or burns until nothing is left. This prevents its use for illuminating purposes. He found this to be caused, not by volatilization, as generally understood, but by detrition, the currents of gas rubbing off fine particles. He prevented this by coating the wire with oxide of magnesium.

By further experiments Mr. Edison supplemented Dr. John W. Draper's discovery that platinum wire in a Bunsen flame becomes disintegrated. He states in his paper the fact that all metals have air spaces in them, and that these interstices are the origin of the cracks which become visible through a microscope after incandescence, and to the naked eye in platinum if a wire is stretched between clamp posts. These being the conditions, Mr. Edison put his platinum under the receiver of a powerful air-pump, and by alternately subjecting it to the action of a vacuum and sending an electric current through it to aid the expulsion of air by warmth, he produced a wire in which "no cracks were visible" by the microscope. "The wire had become as white as silver, and had a polish which could not be given it by any other means. The wire had a less diameter than before treatment, and it was exceedingly difficult to melt in the oxyhydrogen flame. As compared with untreated platinum, it was found that it was as hard as the steel wire used in pianos, and that it could not be annealed at any temperature."

Mr. Edison adds: "My experiments with many metals treated by this process have proved to my satisfaction, and I have no hesitation in stating that what is known as annealing metals to make them soft and pliable is nothing more than the cracking of the metal. In every case where a hard drawn wire has been annealed a powerful microscope revealed myriads of cracks in the metal."

Further experiments showed that a very much higher illuminating power could be obtained at a much less expenditure of force than in the original platinum. He has made, in fact, a new kind of platinum, and other metals, by the same process, are transformed in the same manner.

Friction of Fluids Against Solids.

A plank drawn through water suffers (as is well known) a resistance varying as to the square of the velocity; while a current of water is retarded measurably by the drag on the banks and on the bottom. The center of a stream, moreover, travels faster than the sides, and the different fluid layers rub against each other.

Prof. Unwin, of London, has devised a special apparatus for determining the frictional resistance in such cases. His device consists of a metallic disk, rotated on a vertical axis in a vessel of water. Within the outer vessel is a thin copper chamber; and within this chamber, the disk is placed concentrically; so that there are two cheese-shaped masses of water—one above and one below the disk—which are dragged into rotation next the disk and retarded next the sides of the pan. This chamber is suspended from three wires, in such a manner as not to obstruct its tendency to rotate when the motion is uniform. An index marks on a graduated scale whether it rotates or not, while a weight hung by a cord measures the force required to keep the index at zero. The results obtained are not ready for publication; but the author mentions that a rough cast-iron disk has a frictional resistance almost exactly as the square of the velocity, while in the case of a turned brass disk, the resistance increased in a decidedly smaller ratio. The resistance increases slightly with the mass of water.

RUNNING A LOCOMOTIVE WITH AIR.—An amusing incident in the career of Mr. A. L. Holley is related by a New York paper. While working as an engineer on one of the railways he made a wager with some of his fellows that he could run a locomotive a mile without fire, water, or steam, the locomotive to be taken empty and cold from the shop, and towed by another engine to a point at some distance on the road, where a level stretch of track favored the experiment. Young Holley rode in solitary state on his cold locomotive to the scene of trial, and, unsuspected by his escort, so arranged matters that during the trip the motion of the drivers and pistons stored the boilers with compressed air! This gave him, by the time the destined point was reached, an accumulation of power by means of which he ran his mile and won his wager.

New Planets.

Perhaps no scientific achievement during the present century has been deemed more marvelous than the discovery of the outermost member (so far as is known) of the sun's family of planets. In many respects, apart from the great difficulty of the mathematical problem involved, the discovery appealed strongly to imagination. A planet, 1,700,000,000 miles from the sun, had been discovered in March, 1771, through a mere accident, though the accident was not likely to occur to anyone but an astronomer constantly studying the star-depths. Engaged in such observations, but with no idea of enlarging the known domain of the sun, Sir W. Herschel perceived the distant planet, Uranus. His experienced eye at once recognized the fact that the stranger was not a fixed star. He judged it to be a comet. It was not until several weeks had elapsed that the newly discovered body was proved to be a planet, traveling nearly twice as far away from the sun as Saturn, the remotest planet before known. A century only had elapsed since the theory of gravitation had been established. Yet it was at once perceived how greatly this theory had increased the power of the astronomer to deal with planetary motions. Before a year had passed more was known about the motion of Uranus than had been learned about the motion of any of the planets during 2,000 years preceding the time of Copernicus. It was possible to calculate in advance the position of the newly discovered planet, to calculate retrogressively the path along which it had been traveling, unseen and unsuspected, during the century preceding its discovery. And now observations which many might have judged to be of little value came in most usefully. Astronomers, since the discovery of the telescope, had formed catalogues of the places of many hundred stars invisible to the naked eye. Search among the observations by which such catalogues had been formed revealed the fact that Uranus had been seen and catalogued as a fixed star 21 several times! Flamsteed had seen it five times, each time recording as a star of the sixth magnitude, so that five of Flamsteed's stars had to be cancelled from his lists. Lemonnies had actually seen Uranus 12 times, and only escaped the honor of discovering the planet (as such) through the most marvelous carelessness, his astronomical papers being, as Arago said, "a very picture of chaos." Bradley saw Uranus three times; Mayer saw the planet once only. It was from the study of the movements of Uranus as thus seen, combined with the planet's progress after its discovery, that mathematicians first began to suspect the existence of some unknown disturbing body. The observations preceding the discovery of the planet range over an interval of 90 years and a few months, the earliest observation used being one made by Flamsteed, on December 23d, 1690. There is something very strange in the thought that science was able thus to deal with the motions of a planet for nearly a century before the planet was known. Astronomy calculated in the first place where the planet had been during that time; and then, from records made by departed observers, who had had no suspicions of the real nature of the body they were observing, astronomy corrected her calculations, and deduced more rigorously the true nature of the new planet's motions.—*R. A. Proctor, in the Contemporary Review.*

FIRE WITHOUT COAL.—We publish the following extract from a letter of Miss M. Betham Edwards to the London *Athenæum* for what it is worth. Miss Edwards is well-known in England as a writer, and some credit may be placed in her statement: "I send you the following particulars of a recent scientific invention, just patented, and destined without doubt to play a very important part in our economic history. I think it must be regarded as a solution for once and for all of the great coal question, or rather fuel question, not only among ourselves, but abroad. M. Bourhonnel, of Dijon, the celebrated lion and panther slayer, lighted upon the following discovery by hazard, and after six years' persistent investigation brought it to entire 'workable' perfection. He discovered by means of two natural substances, inexhaustible in nature, the means of lighting and maintaining a fire without wood or coal; a fire instantaneously lighted and extinguished; a fire causing no dust, smoke, or trouble; a fire costing one-tenth at least of ordinary fuel; and, what is more wonderful still, a fire the portion which answering to our fuel is everlasting, that is to say, would last a lifetime. M. Bourhonnel's invention comprehends both stove and fuel. The fires could be on the minutest scale or on the largest. They would be used for heating a baby's food or for roasting an ox. Being lighted instantaneously they will be a great economy of time. M. Bourhonnel at once patented his invention, and a body of engineers and *savants* from Paris visited him, and pronounced his discovery one of the most remarkable of the age. He has had several offers for the purchase of the patent in France, but wants to sell it in England, his own occupation being in another line. Any English gentleman or firm wishing to see his fires and stoves could do so by writing to him a day or two beforehand. His address is M. Bourhonnel, Dijon. . . . I have seen these fires and stoves. There is no mistake about the matter. It is as clear as possible that here we have a perpetual and economical source of fuel. Two hundred years ago the discoverer would have surely been burnt as a wizard."

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Aug. 28		Week Ending Sept. 4.		Week Ending Sept. 11		Week Ending Sept. 18	
Alpha	25½	23½	25½	23¾	27½	24	29	19¾
Alta	6¾	6½	6⅝	5½	6⅝	6	6⅝	6¼
Andes	1	90c	1	90c	1	90c	1.05	1
Alps	....	....	....	....	....	....	....	....
Argenta	1	90c	80c	75c	80c	75c	75c	70c
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	....	....	20c	....	....	....	20c	....
Baltimore Con	50c	....	50c	....	50c	....	60c	50c
Belcher	4.85	4½	4.65	4½	4⅝	4.55	4⅝	4.40
Belmont	75c	60c	85c	65c	80c	65c	55c	....
Best & Belcher	19½	18½	16⅝	18	19¼	18	18⅝	17¼
Bullion	7⅞	6	8¼	7¼	8⅝	7⅝	8⅝	7¾
Bechtel	1.30	1¼	1.30	1¼	1.30	....	1.45	1.20
Belle Isle	4.30	3¾	4.45	4.30	3.90	3.55	4.45	4.15
Bodie	11	10½	10⅞	10	10⅝	10¼	14½	11
Benton	4	3.80	3.90	3½	4.10	3.80	4	3.60
Bulwer	8½	....	9	8⅝	9¼	8⅝	10½	8⅝
Boyle	....	....	....	....	....	....	....	....
Black Hawk	1.10	1	1.05	1	1.05	75c	1	85c
Belvidere	1	75c	75c	....	1	80c	1	80c
Booker	1.35	1.15	1.20	1	1.20	1.05	1.35	1.05
Caledonia	2	1.70	1.95	1.85	2¼	1.85	2.10	1.70
California	4.80	4.60	4.95	4.80	4.95	4¾	5	4.65
Challenge	2.30	....	2.40	2	2¼	2¾	2.60	2.25
Chollar	7¾	6½	7	6¾	7¾	6¾	7¾	6⅝
Confidence	11½	10	11	10½	11½	10⅞	11½	10
Con Imperial	1.55	1.40	1.70	1.45	2.05	1⅝	2	1.30
Con Virginia	4.85	4.60	4.85	4⅝	4.90	4⅞	4.95	4⅞
Crown Point	4.35	4	5.80	3.70	3.90	3.70	3.95	3.70
Con Washoe	1.05	75c	....	....	....	....	....	....
Champion	50c	45c	45c	40c	40c	30c	30c	25c
Concordia	....	....	10c	5c	10c	6c	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	25c	....	10c	....	20c	15c	50c	20c
Eureka Con	16⅝	16½	16⅝	16	16⅝	16¼	29	17½
Exchequer	6½	6	6⅝	6¼	7⅝	6⅝	7⅝	5⅝
Endowment	40c	....	50c	45c	30c	....	35c	30c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	3.80	2.60	3.55	2⅝	2⅝	2¼	2.90	2½
Gila	1.10	50c	55c	50c	60c	55c	50c	40c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	12⅝	....	....	....	12	....	8	....
Goodshaw	45c	40c	50c	40c	50c	35c	40c	....
Gould & Curry	12¼	11¾	12	11⅜	12⅝	11⅝	12¼	11¼
Hale & Norcross	15¼	13⅝	14⅞	14	15	14⅜	14⅝	13⅜
Hillside	1½	1¼	1.60	1½	1.85	1.65	2	1.80
Highbridge	....	....	5c	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	10c	5c	5c	....	10c	5c	5c	....
Independence	2.20	2	2.15	2.10	2.20	2.05	2.15	2.05
Julia	4.35	4.05	4.40	4.15	4.90	4.15	4¾	4.20
Justice	3⅜	3	3	2.60	4½	2¾	4¼	3½
Jackson	6	4⅝	....	....	4	....	....	....
Joe Scates	....	....	....	....	....	....	....	....
K K Con	1	....	1	....	2	1⅜	....	....
Kentuck	4¼	4	4¼	4	4¼	4	4.40	4.20
Kossuth	....	....	20c	....	20c	....	10c	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	60c	50c	60c	55c	60c	50c	55c	40c
Lady Wash	1.20	1.10	1.20	1.05	1.30	55c	1¼	1
Leopard	60c	30c	40c	30c	35c	25c	25c	20c
Leviathan	25c	....	30c	25c	55c	25c	60c	50c
Leeds	....	....	70c	65c	70c	....	50c	....
Lee	....	....	....	....	....	....	....	....
May Belle	25c	....	25c	....	....	....	25c	....
Modoc	1.10	1	1½	1	....	....	....	....
Manhattan	3	2¾	3	2¾	3½	3	3.40	2¾
Martin White	3¼	2½	2.20	2	2.10	1.20	1.80	1¼
McClinton	1	75c	1	70c	75c	65c	60c	55c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	35	32¾	35	33½	37	33	38⅝	36½
Mides	....	....	....	....	....	....	....	....
Morning Star	3.15	....	....	....	....	....	....	....
North Con Virginia	8½	....	8	7¾	8	7½	8	....
New York	70c	60c	90c	55c	70c	60c	70c	60c
Northern Belle	4	3.95	3¾	3½	4	4¼	4	3½
New Coso	....	....	....	....	....	....	....	....
Navajo	35c	25c	30c	25c	30c	25c	50c	30c
Occidental	1.40	65c	1	75c	1.65	90c	2.05	1.70
Ophir	37	35½	36¾	35¾	38¼	35	42¼	39¼
Oriental	40c	35c	40c	30c	50c	25c	45c	10c
Overman	9	8¼	9	8¾	10	8¾	10	8½
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	1½	....	2½	....	3	2½
Phil Sheridan	....	....	40c	....	....	....	50c	30c
Potosi	5⅝	4¼	5½	4.85	6½	5⅜	6½	5½
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	90c	65c	75	65c	75c	65c	75c	65c
Richer	20c	15c	40c	15c	30c	25c	40c	25c
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	12¼	12¾	15	14¼	15⅞	14½	15	13⅜
Seg Belcher	14	....	24	23½	23	22½	23	20
Sierra Nevada	42	39½	43¾	41½	47½	41	48	45
Silver Hill	1.65	1½	1.60	1½	2	1.60	1.80	1.60
Silver King	5	4	....	....	4½	....	....	....
Silver Prize	20c	....	15c	10c	10c	....	....	....
Succor	15c	10c	15c	10c	10c	5c	10c	5c
Summit	1.80	1⅝	1.70	1½	1½	1¼	1.70	1½
Scorpion	2¾	2.30	2.70	2½	3	2½	3	2.80
Solid Silver	....	....	....	....	....	....	25c	....
South Bodie	35c	30c	30c	....	35c	30c	30c	20c
South Standard	15c	....	5c	....	10c	....	10c	5c
Star	....	....	45c	40c	40c	....	50c	45c
St. Louis	30c	....	....	....	40c	....	....	....
Syndicate	7	6¾	6⅝	5⅞	6	5⅜	6	5¼
Tioga Con	4	3.55	3.55	3.45	3.60	2.95	3	2¾
Tiptop	....	....	90c	75c	1	90c	85c	80c
Trojan	30c	....	30c	25c	40c	25c	40c	35c
Union Con	57½	50	62½	55½	73½	69	75½	69½
Utah	19½	18¼	19	18	21	18¾	20½	18½
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.95	1.80	2	1.85	2.95	1.95	2.60	2.35
Wells Fargo	10c	....	....	....	10c	5c	10c	5c
Woodville	45c	40c	40c	35c	45c	35c	45c	35c
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	16⅝	15¼	17	15⅝	18	16¼	18	16¼

Sales at S. F. Stock Exchange.

Friday A. M., Sept. 12.
540 Alpha 29@26
130 Alta 6⅝@6½
70 Andes 1
800 Bullion 8½@8⅝
160 Best & Belcher 18⅝
160 Belcher 4¾
265 Benton 3.95
660 Baltimore Con 50c
210 Confidence 11@11¼
35 Caledonia 2.10
355 California 4.70@4⅞
185 Con Virginia 4⅞@4.80
6850 Con Imperial 2@1.90
410 Crown Point 3.95
400 Chollar 7⅞@7⅝
200 C P Ravine 20c
330 Challenge 2.55@2½
590 Exchequer 7½@7⅝
650 Flowery 70c
370 Gould & Curry 12⅞@12⅜
180 Hale & Nor 14⅝@14⅞
345 Julia 4¾@4.70
500 Justice 4⅛@4.20
110 Kentuck 4.40@4¼
100 Kossuth 10c
500 Lady Wash 1½
150 Lady Bryan 55@50c
100 Leviathan 55c
825 Mexican 38½@37½
1475 Mackey 1¼@1.20
510 N Bonanza 1.40@1.45
1200 New York 70@65c
110 Occidental 1⅞@1.70
100 Overman 9¾@10
645 Ophir 39¾@40
385 Potosi 6¼@6⅝
290 Savage 14⅝@15
1785 Scorpion 2.80@2⅞
50 Succor 10c
70 Silver Hill 1⅞@1.80
820 Sierra Nevada 48@46⅞
300 Solid Silver 25c
600 Trojan 40c
70 Utah 20@20¼
1050 Union Con 72½@74
575 Ward 2.55@2.60
150 Woodville 40c
1600 Wells-Fargo 10c
485 Yellow Jacket 17⅝@18

AFTERNOON SESSION.
800 Argenta 75c
300 Belle Isle 4¼
235 Bodie 11@11¼
2900 Big Prize 60@55c
860 Bechtel 1.30@1¼
165 Bulwer 9@8⅞
110 Belvidere 90@95c
360 Black Hawk 90c@1
75 Booker 1.35@1.30
450 B Chief 75c
40 C Pacific 6⅞@6½
200 Champion 30@25c
100 Defiance 25c
200 Dudley 75@80c
2160 Day 20c
75 Eureka Con 17½
845 Grand Prize 2.70@2⅝
550 Gila 50@45c
30 Golden Terra 8
200 Hillside 1.95@2
100 Hussey 5c
590 Independence 2.10@2.15
175 Jupiter 1.65@1⅝
300 Leopard 20@25c
200 Metallic 40c
135 Manhattan 2⅝@2½
155 Mammoth 9
860 Martin White 1½@1.60
830 Mono 6½@6
165 McClinton 60c
95 Mt Diablo 4⅞@5
30 Northern Belle 3.95
2175 N Belle Is 45c
100 Noonday 3
100 Navajo 30c
565 Oriental 40@45c
50 Orient 15c
910 Paradise 2.30@2.20
125 Queen Bee 50@45c
400 Ray'd & Ely 75@70c
200 Richer 30@25c
200 Star 45c
270 S Bulwer 60@65c
500 Summit 1.70
300 Syndicate 5¾
200 S Bodie 30@25c
100 S Standard 10c
250 Tioga Con 2⅞@2.90
200 Tuscarora 20c
350 Tiptop 80@85c

Saturday A. M., Sept. 13.
150 Alpha 26⅝@27
200 Alta 6½
405 Andes 1.05@1
100 Argenta 70c
70 Best & Belcher 18¾@18⅝
320 Belcher 4.65@4.70
485 Bullion 8⅝@8¾
850 Baltimore Con 50@60c
200 Benton 3.95@4
355 Belle Isle 4.15
800 Big Prize 50c
140 Bodie 11
150 Bechtel 1.35
50 Bulwer 8¾
10 Belvidere 1
200 Black Hawk 1
280 Booker 1.20@1¼
350 Boston 1.30
175 California 4.70@4.65
310 Con Virginia 4¾@4.80
180 Chollar 7¼
665 Crown Point 3.90@3.80
1200 Con Imperial 1.85@1.80
75 Caledonia 2.10@2.05
125 Challenge 2.55@2.60
640 Con Dorado 1¾@1.70
280 Champion 25@20c
25 C Pacific 6¾
1300 Day 20@25c
600 Exchequer 7⅝@7½
100 Eureka Con 17½
150 Flowery 70c
570 Gould & Curry 12@12¼
500 Grand Prize 2.70@2⅝
500 Gila 50@45c
390 H & Norcross 14⅝@14¼
600 Hussey 5c
360 Independence 2.15@2.10
295 Justice 4.20@4.15
175 Julia 4.60@4.55
100 Jupiter 1.55
340 Kentuck 4¼
890 Lady Bryan 55@45c
395 Lady Wash 1¼
50 Leopard 20c
780 M White 1.30@1¼
1810 Mexican 38½@38¾
1800 Mackey 1¼@1.30
300 Mary Ann 85c
300 Metallic 40c
25 Mt Diablo 5
170 Mono 6¼
930 New York 70@65c
100 N Bonanza 1.55
10 North Con Vir 8
800 Navajo 35c
250 N Belle Is 40c
560 Ophir 41½@42
150 Overman 9½
610 Occidental 1.90@2
500 Oriental 40c
475 Potosi 6¼@6⅛
300 Plutus 2.15
150 Paradise 2¼
140 Raymond & Ely 65c
325 Savage 14⅝@14½
260 Sierra Nevada 47½
905 Silver Hill 1⅝@1.70
445 Scorpion 2.90@2.85
800 Solid Silver 25c
50 Summit 1.40
90 Syndicate 5½@5¼
200 South Standard 10c
20 S Bulwer 60c
1050 Trojan 40@35c
500 Tuscarora 15c
480 Tioga Con 3
85 Utah 20½@20¼
785 Union Con 75@75½
1110 Ward 2.55@2½
1000 Wells-Fargo 10@5c
100 Woodville 45c
100 Wales 8½
510 Yellow Jacket 17½@17⅝

Monday A. M., Sept. 15.
330 Alpha 24½@23½
240 Alta 6⅝@6½
360 Andes 1@1.05
720 Bullion 8½
280 Belcher 4.60@4.55
85 Best & Belcher 18¼@18½
55 Benton 3.95
455 C Dorado 1⅞@1.65
80 Con Virginia 4⅞
130 California 4.70@4¾
100 Confidence 10
300 Caledonia 1.95@2
485 Crown Point 3⅞@3.85
1775 Con Imperial 1.60@1.70
320 Chollar 7½
730 Exchequer 7½@7⅝
450 Flowery 70@75c
395 Gould & Curry 12@11⅞
345 Hale & Nor 14½@14
335 Julia 4½@4.60
250 Justice 4.05@4
225 Kentuck 4¼
200 Lady Bryan 50@45c
200 Leviathan 60c
100 Lady Wash 1¼
1155 Mexican 36½@37½
1300 Mackey 1⅜@1.30
415 N Bonanza 1.60@1.65
650 New York 65c
770 Occidental 2@2.05
510 Ophir 42½@41⅞
165 Overman 9¼@9⅜
150 Potosi 5⅝
950 Scorpion 2.90@3
360 Savage 14⅝@14⅜
10 Seg Belcher 23
200 Silver Hill 1⅝
225 Sierra Nevada 46½@46⅝
1670 Trojan 40@35c
105 Utah 20¼
1060 Union Con 72@70
300 Woodville 40c
200 Wells-Fargo 10c
430 Ward 2.55@2½
405 Yellow Jacket 17¼@16⅝

AFTERNOON SESSION.
100 Argenta 70c
550 Adenda 45@50c
125 Boston 1.30@1.35
250 Booker 1.15
800 Bechtel 1.45@1.20
115 Bulwer 9
3100 Big Prize 55@50c
340 Bodie 11@11½
1870 Belle Isle 4.20
130 Black Hawk 95@85c
100 Belvidere 1
145 Champion 20@25c
20 Caledonia (B H) 3
160 C Pacific 6⅞@6½
4050 Day 25c
100 Defiance 50c
610 Eureka Con 18½@21⅝
200 Fourth July 50c
100 Goodshaw 30c
310 Grand Prize 2.90@2⅞
400 Gila 50@45c
100 Hussey 5c
300 Hillside 1.90@1.60
10 Independence 2.15
220 Jupiter 1.65@1½
350 Leopard 25c
250 Mono 6
1485 M White 1¼
150 Mt Diablo 6
500 Metallic 45c
80 Manhattan 3.40@3.30
305 Northern Belle 3.80@4
2000 N Belle Is 45c
10 Noonday 2⅞
490 Navajo 45@50c
530 Oriental 25@15c
100 Phenix 2½
325 Paradise 2.30@2½
980 Queen Bee 50@40c
50 Raymond & Ely 75c
200 S Bulwer 60c
100 S Standard 5c
90 Syndicate ....
200 S Bodie 20@25c
25 Summit 1.40
445 Tioga Con 3@2.80
100 Tuscarora 15c

Tuesday A. M., Sept. 16.
225 Alta 6⅞@6½
380 Andes 1@1.05
920 Alpha 21@20
280 Belcher 4½@4.60
640 Bullion 8½
1160 Baltimore Con 50@60c
175 Best & Belcher 18⅞@18
120 Benton 3.80
550 Con Dorado 1.80
255 California 4¾@4.85
90 Con Virginia 4¾
235 Chollar 7½@7⅞
4210 Con Imperial 1.60@1½
175 Crown Point 3.70@3.80
440 Caledonia 1.90
10 Confidence 10½
100 C P Ravine 25c
1480 Exchequer 6⅝@6
500 Flowery 70@65c
340 Gould & Curry 11½
100 H & Norcross 13⅜
410 Julia 4.60@4.55
390 Justice 3.90@3.95
50 Kentuck 4.20
100 Lady Wash 1½
370 L Bryan 45@50c
670 Mexican 36½@37
920 Mackey 1¼@1.20
435 N Bonanza 1.60
30 North Con Vir 8
1300 New York 60c
1070 Ophir 42½@41⅞
360 Occidental 2
90 Overman 9¼@9
50 Phil Sheridan 30c
130 Potosi 5⅝@5⅞
35 Scorpion 3
220 Savage 13⅞@14
480 Silver Hill 1.70
200 Succor 10c
270 Sierra Nevada 45½@45
2000 Trojan 35c
120 Utah 20
480 Union Con 69½@70⅞
50 Ward 2.45
30 Yellow Jacket 17

AFTERNOON SESSION.
750 Argenta 75c
500 B Chief 75c
200 Boston 1.30
250 Booker 1.20@1.15
300 Black Hawk 90c
205 Bulwer 9@9¼
250 Belvidere 90c
1960 Big Prize 50c
790 Bodie 11⅞@12½
1295 Belle Isle 4.20@4¼
415 Bechtel 1¼@1.30
300 Belmont 55c
850 Champion 25c
900 Crœsus 25@20c
65 C Pacific 7@6⅞
100 Day 35c
250 Defiance 40c
450 Dudley 95c@1
100 Endowment 35c
240 Eureka Con 21½@22¼
200 Fourth of July 60c
350 Goodshaw 40c
525 Gila 50@45c
50 Grand Prize 2⅞
200 Hamburg 25c
300 Hillside 1.90@1.85
850 Independence 2.10@2.05
100 Jupiter 1.60
300 Leeds 50c
550 Leopard 25@20c
100 May Belle 25c
160 Mono 6½
200 McClinton 55@60c
50 Mt Diablo 6
500 Metallic 45c
1155 Martin White 1.55@1¼
220 Northern Belle 3.60
1850 N Belle Is 40c
1550 Navajo 45@40c
45 Noonday 3
100 Oriental 15c
200 Orient 5c
200 Phenix 3
400 Paradise 2¼
460 Raymond & Ely 65@70c
300 Richer 30@40c
200 Star 50@45c
350 S Bulwer 60@55c
450 S Standard 5@10c
310 Syndicate 5⅞@6
225 Summit 1.45@1½
400 S Bodie 20c
100 Tioga 3
60 Tiptop 85c
150 University 5@10c
25 Wales 9¼

Wed'sday A. M., Sept. 17.
5 Alta 6¼
170 Andes 1@1.05
1025 Alpha 18@17⅝
80 Belcher 4.40@4½
350 Benton 3.60@3.70
455 Bullion 7⅝@7½
40 Best & Belcher 17½
385 California 4.85@4.90
100 Con Virginia 4.95@4.90
140 Chollar 7
180 Con Dorado 1⅞
100 C P Ravine 25c
130 Caledonia 1.70
3500 Con Imperial 1.40@1.30
50 Challenge 2¼
120 Crown Point 3.70@3⅝
380 Exchequer 5⅝
100 Flowery 55c
120 Gould & Curry 11¼
100 Hale & Nor 13⅝
50 Julia 4.40
880 Justice 3.65@3½
120 Kentuck 4¼
530 Lady Bryan 40@50c
200 Leviathan 55@50c
780 Lady Wash 1@1¼
460 Mexican 37@37¼
600 Mackey 1.20
100 Mountain View 2⅞@2.60
180 New York 60c
550 N Bonanza 1.60@1.65
520 North Con Vir 8
435 Ophir 41½@41
90 Overman 8⅞@8½
380 Occidental 2
170 Potosi 5⅝@5¾
50 Phil Sheridan 35c
695 Scorpion 3@2.95
375 Sierra Nevada 46@45⅞
105 Savage 14½@14
150 Succor 6c
260 Senator 25c
60 Silver Hill 1.60@1.65
1150 Trojan 40@35c
145 Union Con 72@71½
105 Utah 19@18⅞
1000 Wells Fargo 10c
470 Ward 2.35@2.45
40 Woodville 35c
320 Yellow Jacket 16¼@16⅝

AFTERNOON SESSION.
90 Addenda 30c
300 Aurora T. 20c
800 Argenta 75c
100 Belmont 55c
1160 Bodie 14⅜@13⅞
1450 Belle Isle 4.30@4.45
2400 Big Prize 50c
280 Bechtel 1.20
45 Bulwer 9⅛@10½
130 Belvidere 90@80c
150 Booker 1.05@1.15
375 Black Hawk 95c@1
50 Boston 1.30
700 Crœsus 20c
175 C Pacific 7@6⅞
500 Caledonia (B H) 2½
300 Champion 25c
1950 Day 40@50c
200 Defiance 50c
550 Endowment 30c
185 Eureka Con 26½@29
50 Goodshaw 40c
175 Gila 40c
190 Grand Prize 2.60@2½
100 Hussey 5c
610 Independence 2.05
475 Jupiter 1.60
465 Mono 6⅞@7
580 Martin White 1.80@1⅞
10 Mammoth 9
1100 Metallic 45c
50 Mt Diablo 6
120 Northern Belle 3½@3⅞
700 Navajo 40c
600 N Belle Is 45@40c
3276 Orient 15@25c
400 Oriental 15@10c
600 Paradise 2¼@2.20
500 Raymond & E 70c
25 Richer 30c
50 South Standard 10c
300 S Bulwer 60c
800 Star 50c
250 Summit 1¼@1.30
50 Syndicate 5⅞
600 Tioga Con 3@2.90
225 University 15c
75 Wales 9½

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Con M Co	Nevada	10	1 00	Aug 7	Sept 11	Oct 1	Wm Willis	309 Montgomery st
Argonaut M & M Co	California	1	05	Aug 11	Sept 15	Oct 6	J L Fields	240 Montgomery st
Best & Belcher M Co	Nevada	15	1 00	Aug 29	Oct 2	Oct 22	Wm Willis	309 Montgomery st
Bullion M Co	Nevada	11	50	Aug 12	Sept 16	Oct 7	J M Brazell	418 California st
Caledonia S M Co	Nevada	28	50	Aug 21	Sept 26	Oct 17	R Wegener	414 California st
Champion M Co	Nevada		05	July 26	Aug 31	Sep 30	G C Hurlbut	525 Commercial st
Chollar M Co	Nevada	1	50	Aug 29	Oct 3	Oct 24	W E Dean	203 Bush st
Crown Point G & S M Co	Nevada	38	1 00	Aug 27	Oct 1	Oct 22	James Newlands	203 Bush st
Concordia M Co	California	2	15	Aug 20	Sept 26	Oct 21	A W Fox	310 Pine st
Dudley M Co	California	5	50	Aug 14	Sept 17	Oct 13	E C Masten	22 Nevada Block
Eagle S M Co	Nevada	14	10	Aug 4	Sept 10	Sept 30	J E Byrne	533 Kearney st
Flowery M Co	Nevada	2	25	Aug 6	Sept 10	Sept 30	W W Stetson	309 Montgomery st
Goodshaw M Co	California	4	25	July 9	Aug 23	Sept 30	V Fernbach	327 Pine st
Hale & Norcross S M Co	Nevada	62	1 00	Sept 9	Oct 14	Nov 4	J F Lightner	58 Nevada Block
Hussey Con G & S M Co	Nevada	9	15	Aug 25	Sept 30	Oct 21	Jno E Dixon	20 S. F. Stock Ex.
Justice M Co	Nevada	—	1 00	———	Sept 11	Sept 30	R E Kelley	419 California st
K K Con M Co	Nevada	—	1 00	Aug 1	Sept 3	Oct 1	B B Minor	309 Montgomery st
Leopard M Co	Nevada	12	50	Aug 23	Sept 26	Oct 17	Jno E Dixon	20 S F Stock Ex.
Leviathan M Co	Nevada	9	25	Aug 6	Sept 9	Sept 30	F E Luty	330 Pine st
Mexican G & S M Co	Nevada	8	1 50	Sept 11	Oct 15	Nov 6	C L McCoy	203 Bush st
Mono G M Co	California	5	1 00	Sept 4	Oct 9	Oct 29	W H Lent	309 Montgomery st
North Bonanza M Co	Nevada	3	25	Aug 13	Sept 17	Oct 7	W W Stetson	309 Montgomery st
Original Keystone S M Co	Nevada	2	25	July 28	Sept 1	Sept 28	F E Luty	330 Pine st
Occidental Con G M Co	California	2	03	Aug 11	Sept 29	Oct 20	W T Smith	402 Montgomery st
Potosi M Co	Nevada	1	50	Aug 29	Oct 7	Oct 28	W E Dean	203 Bush st
Sierra Nevada S M Co	Nevada	59	2 00	Aug 30	Oct 3	Oct 22	W W Stetson	309 Montgomery st
South Standard M Co	California	5	15	Sept 11	Oct 15	Nov 3	C A Sankey	331 Montgomery st
Succor M & M Co	Nevada	24	25	Aug 30	Oct 3	Oct 23	Wm H Watson	302 Montgomery st
Tellurium G & S M Co	California	19	10	Aug 1	Sept 1	Sept 24	J M Litchfield	415 Montgomery st
Tioga Con M Co	California	7	30	Sept 10	Oct 15	Nov 4	W H Lent	62 Nevada Block
Tuscarora M & M Co	Nevada	4	10	Aug 2	Sept 6	Sept 30	M E Sperling	309 California st
University G M Co	California	3	20	Aug 21	Sept 24	Oct 15	W L Oliver	328 Montgomery st
Union Con S M Co	Nevada	14	2 00	July 31	Sept 4	Sept 23	J M Buffington	309 California st
Yellow Jacket S M Co	Nevada	33	1 00	Aug 4	Sept 8	Oct 8	Mercer Otey	Gold Hill, Nevada

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Butte Hydraulic M Co	California	—	10 00	Aug 25	Sept 29	Oct 21	L L Dennery	328 Montgomery st
Crœsus C & S M Co	California	2	10	Aug 22	Sept 23	Oct 11	E Huestis	328 Montgomery st
Dardanelles M Co	Nevada	7	50	Sept 9	Oct 10	Oct 27	H C Hinman	411 California st
Double Standard G M Co	California	1	10	Sept 13	Oct 21	Nov 11	W H Lent	309 Montgomery st
Dudley M Co	California	5	50	Aug 14	Sept 17	Oct 13	E. C. Masten	309 Montgomery st
Harrington M Co	California	1	20	Aug 11	Sept 18	Oct 8	W W Bausman	426 California st
Keystone S M Co	California	2	25	July 28	Sep 16	Oct 6	F E Luty	330 Pine st
Maybelle Con M Co	California	3	10	Sept 6	Oct 15	Nov 10	A W Fox	310 Pine st
Meadow Valley M Co	Nevada	15	25	Sept 12	Oct 22	Nov 17	T W Colburn	414 California st
North Scorpion M Co	Nevada	1	10	Aug 11	Sept 20	Oct 10	T B Ludlum	211 Sansome st
Original Keystone S M Co	Nevada	2	25	July 28	Sept 1	Sept 28	F E Luty	330 Pine
Occidental M Co	Nevada	6	50	Aug 11	Sept 15	Oct 6	A K Purhrow	309 Montgomery st
Santa Mina G M Co	California	1	15	Aug 29	Oct 2	Oct 22	J H Sayre	330 Pine st
Sherwood Con M Co	Nevada	2	10	Sept 1	Oct 6	Oct 23	H S Stone	309 California st
South Utah M Co	Nevada	3	10	Sept 5	Oct 6	Oct 25	C S Healy	45 Merchants Ex
South Comstock G & S M Co	Nevada	6	25	Sept 9	Oct 13	Nov 3	J M Buffington	309 California st
Red Hill H M & W Co	California	2	03	Sept 1	Oct 2	Oct 18	A B Paul	228 Montgomery st
Richer M Co	California	3	25	July 13	Sept 3	Sept 23	W H Lent	309 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Alaska M Co	———	C W Crane	10 Leidesdorff st	Annual	Sept 22
Alexander M Co	———	A B Cooper	328 Montgomery st	Annual	Sept 30
Belle Isle M Co	Nevada	J E Dixon	20 S F Stock Ex	Annual	Sept 25
Cherokee Flat Blue G M Co	California	R N VanBrunt	318 Pine st	Special	Sept 23
Curtis Con M Co	———	J M Buffington	309 California st	Stockholders	Sept 23
Fairfax M Co	———	O C Miller	426 California st	Annual	Oct 3
Humboldt M Co	———	W L Oliver	328 Montgomery st	Annual	Oct 1
Nevada M Co	Nevada	J T McCeoghan	318 Pine st	Annual	Sept 23
Niagara G & S M Co	———	C A Morse	217 Sansome st	Annual	Sept 23
N Scorpion M Co	Nevada	C E Gillett	211 Sansome st	Annual	Oct 6
Reno M Co	Nevada	J T McGeoghan	318 Pine st	Annual	Sept 23
Syndicate M Co	California	Jacob Stadfeldt Jr	419 California st	Annual	Oct 16
Trojan M Co	Nevada	D Wilder	328 Montgomery st	Special	Sept 25

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Belle Isle M Co	Nevada	John E Dixon	Stock Exchange	50	Aug 6
Bodie Con M Co	California	W H Lent	Nevada Block	1 00	Aug 1
California M Co	Nevada	C P Gordon	23 Nevada Block	50	Aug 17
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	50	Aug 16
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	1 00	July 21
Independence M Co	Nevada	John E Dixon	Stock Exchange	25	Aug 21
Indian Queen M & M Co	———	A K Durbrow	69 Nevada Block	20	Aug 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	July 26
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	30	July 28
Montezuma M & M Co	———	J T McGeoghegan	318 Pine st	25	Aug 12
Standard Con M Co	California	Wm Willis	309 Montgomery st	50	Aug 12

SALES OF LAST WEEK AND THIS COMPARED

Thursd'y A.M., Sept. 11.
195 Alpha 25⅞@25½
185 Alta 6½@6⅝
280 Andes 1
50 B & Belcher 18½
170 Belcher 4⅞
745 Bullion 8¼@8⅝
980 Baltimore Con 50c
400 Benton 4.05@4
200 Crown Point 3.80
455 California 4.80@4⅞
1300 Con Imperial 1.85@1.90
205 Con Virginia 4.80@4⅞
50 Chollar 7¼
300 Caledonia 2@1.95
40 Confidence 11
70 Challenge 2½
150 C P Ravine 25c
430 Con Dorado 1⅞@1.70
430 Exchequer 7⅝@7½
1245 Flowery 65@70c
120 Gould & Curry 11⅞
465 Hale & Nor 14⅜@14⅞
460 Justice 4.05@4.15
340 Julia 4.70@4⅞
235 Kentuck 4¼
50 Leviathan 50c
445 Lady Bryan 50@55c
485 Lady Wash 1¼@1.20
580 Mexican 35⅞@35½
620 Mackey 1.15
100 Mt View 2.60
50 Mary Ann 85c
1220 New York 65c
320 North Con Vir 8
530 N Bonanza 1.40
250 Ophir 37½@37⅞
30 Overman 9⅞@9⅝
160 Occidental 1.65@1.60
1175 Potosi 6¼@6
100 Plutus 2.10
25 Savage 14½
460 Sierra Nevada 45@44
400 Succor 10c
100 Silver Hill 1⅞
10 Seg Belcher 22½
635 Scorpion 2.80@2⅞
85 St Louis 40c
2200 Trojan 40@35c
100 Utah 20@19⅞
795 Union 67½@68¼
1215 Ward 2.60@2.40
150 Woodville 40@45c
255 Yellow Jacket 17

AFTERNOON SESSION.
1500 Argenta 75c
300 Albion 20c
100 Addenda 40c
125 Belle Isle 4.10@4.20
800 Booker 1.20@1.30
700 Black Hawk 1
3500 Big Prize 50@55c
50 Bodie 10⅞
590 Bechtel 1.30@1¼
75 Boston 1.30@1¼
100 Concordia 10c
600 Champion 30c
1600 Day 15@20c
200 Defiance 50c
105 Dudley 95@90c
485 Eureka Con 17
210 Grand Prize 2.70@2.60
3100 Gila 50@55c
300 Goodshaw 40@35c
300 Hussey 6c
195 Hillside 1.80@1.90
100 Independence 2.20
480 Jupiter 1⅞@1.60
1050 Leopard 25c
200 Leeds 65c
450 M White 1⅞
125 Mono 6¼
500 Metallic 40c
210 McClinton 60@65c
80 Manhattan 3¼
30 Mammoth 9½
150 Noonday 3
150 Northern Belle 4
275 Navajo 25@30c
1700 N Belle Is 45c
1720 Oriental 50@45c
400 Paradise 2¼
100 Richer 30c
320 Raymond & E 70@75c
100 S Bodie 35c
50 Star 40c
125 Summit 1.35@1.40
775 S Bulwer 60@65c
140 Syndicate 5⅝
170 Tioga Con 2.80@2.60
450 Tuscarora 15c
100 Tiptop 85c
240 Vortex 60c

Thursday A.M., Sept. 18.
290 Alpha 19⅞@20
45 Alta 6½
330 Andes 1.05@1
130 Belcher 4½
225 Best & Belcher 17¼@17⅝
535 Bullion 7¼
310 Benton 3.70@3.60
215 California 4.90@5
105 Con Virginia 4.95
10 Chollar 6⅝
60 Confidence 10⅝
1595 Con Imperial 1.45@1.40
185 Caledonia 1.90@2
120 C P Ravine 20c
300 C Dorado 1⅞@1.80
270 Challenge 2½@2.35
370 Exchequer 6¼@6⅝
150 Flowery 60c
170 Gould & Curry 11⅜@11½
140 Hale & Nor 13¾@13⅝
120 Justice 3.90
80 Julia 4.20
50 Kentuck 4.30@4.40
1090 L Bryan 45@40c
500 Lady Wash 1.15
20 Leviathan 50c
365 Mexican 37@37¼
100 Mt View 2½
550 Mackey 1.20@1.10
250 N Bonanza 1⅞
580 Ophir 40¼@41
170 Overman 9¼@9½
40 Potosi 5½
200 Phil Sheridan 50c
150 Savage 13⅞@14
315 Sierra Nevada 46¼@46
5 Seg Belcher 20
240 Silver Hill 1.60@1.70
670 Scorpion 3
400 Trojan 35c
135 Utah 19⅞@20
110 Union Con 70⅞@70¼
100 Woodville 35c
1550 Wells-Fargo 10c
780 Ward 2.45@2¼
270 Yellow Jacket 16½@16⅝

AFTERNOON SESSION.
200 Addenda 50c
200 Aurora T 20c
300 Argenta 75c
1550 Belle Isle 4.70
180 Black Hawk 90c
200 Booker 1.10
200 Boston 1.30
175 Bulwer 11½
670 Big Prize 35@45c
335 Bodie 14
120 Bechtel 1.50
200 Belvidere 85c
725 Champion 25@20c
45 C Pacific 6¼
1248 Day 60@50c
200 Dudley 1
750 Defiance 50c
165 Eureka Con 29@28½
300 Fourth July 60c
250 Gila 40@35c
500 Grand Prize 2½
50 Goodshaw 30c
50 Golden Terra 12
200 Hussey 5c
650 Independence 2.05@2.10
300 Jupiter 1.60
200 Leopard 10c
850 Martin White 2.15@2.10
750 Metallic 45@50c
220 Mono 6⅝@7
750 Navajo 40c
800 N Belle Is 40c
230 Oriental 20c
1220 Orient 25c
600 Paradise 2.05
200 Queen Bee 30c
100 Richer 30c
420 Raymond & Ely 65c
630 Star 50@60c
200 S Bulwer 55c
100 S Bodie 30c
30 Syndicate 5⅝
100 S Standard 10c
180 Summit 1½@1.45
260 Tioga Con 3½@3¼
175 Tiptop 85c
500 University 15c
120 Wales 10

Pacific Board—Latest Sales.

Wed'sday A.M., Sept. 17.
60 Alta 6¼
50 Andes 1.05
90 Alpha 19¼@18
765 Bullion 7⅝@7¾
20 Bodie 13
10 Best & Belcher 17¼
150 Belcher 4½@4⅝
200 Benton 3.60
35 California 4.80@4.90
1800 Con Imperial 1.40@1.30
20 Caledonia 1¾
200 Chollar 7@6⅞
200 Crown Point 3⅝
70 Exchequer 5⅞@6
260 Gould & Curry 11½@11¼
50 Hale & Nor 13⅜
100 Julia 4⅝
310 Justice 3.65@3.70
160 Mexican 37⅞@36¼
100 New York 60c
110 Ophir 40⅞@41⅞
100 Potosi 5⅛
70 Savage 13⅝
200 Silver Hill 1.65@1.60
50 Union 72@71
50 Utah 19
120 Ward 2⅞@2.35
150 Yellow Jacket 16½

AFTERNOON SESSION.
30 Andes 1.05
65 Alpha 18½
265 Bullion 7⅝@7½
20 Bodie 14½
700 Con Imperial 1⅜
30 Confidence 10
50 Challenge 2¼
20 Caledonia 1¾
20 Con Virginia 4.90
80 Exchequer 6
30 Eureka Con 28½
30 Gould & Curry 11½
200 Julia 4.20@4.15
50 Lady Wash 1½
20 Mexican 36½
25 Mono 7
60 Mackey 1¼
100 N Standard 2¼
60 Ophir 40@39½
200 Potosi 5⅜@5.30
10 Summit 1½
150 Scorpion 3
50 Trojan 35c
20 Union Con 69½
150 Uncle Sam 1¼@1
100 Ward 2.30
40 Yellow Jacket 16

California Board—Latest Sales.

Wed'sday A.M., Sept. 17.
20 Alpha 19
250 Gipsy Q 55c
20 Hale & Nor 13⅝
80 Julia 4⅝@4.30

20 Alta	.6¾	20 Justice	.3.90
20 Belcher	.14@14¾	100 L Bryan	.50c
20 Best & Belcher	.1.80@1.75	30 Mexican	.37½@37½
20 Bullion	.7½@7½	300 Mint	.10@9c
300 Big Prize	.57½c	1000 North Carson	.1c
100 Black Hawk	.90c	100 N Sierra Nevada	.10c
20 Benton	.3.80	50 New York	.58c
20 California	.4.70	60 Ophir	.41½@41½
20 Con Virginia	.4.80@4.85	20 Savage	.14½
220 Con Imperial	.1.40	10 Sierra Nevada	.40

The Mining Share Market.

Dating from our last report, the market began the week with considerable animation. Union Con. went up into the seventies, while the balance of the Comstocks improved slightly. Lower-priced stocks remained firm. The week has been distinguished by a general advance in prices, the greatest gains being in Ophir, Mexican, Union Con. and Sierra Nevada. The probability of important developments on the Comstock may have something to do with this movement, aside from the manipulator's wiles. An exciting movement is expected, judging from the prognostics derived from sharp fluctuations, which have characterized former remarkable movements. Bodie has taken a sharp advance, and appears to have awakened from its long lethargy. Up to the present writing Bodie is steady, showing a good rise. Ophir, also, has declined $1. Altogether, the market seems to be in a mixed, uncertain condition, with considerable groping for favorite stocks, which do not yet seem to be prepared to take the lead.

Mechanics' Institute Gold Medal.

To the Honorable, the Board of Managers of the Fourteenth Industrial Exhibition of the Mechanics' Institute.

GENTLEMEN:—We, the undersigned, having been elected jurors to consider the merits of the various exhibits competing, first, for the Industrial gold medal, to be awarded for the best general display of California-manufactured articles; and, second, for Inventors' gold medal, for the most meritorious Pacific coast invention on exhibition, not having heretofore received an award—beg leave to submit the following report:

After having carefully examined all the principal exhibits and duly considered the claims of each, we have come to the conclusion that, while all are creditable, yet for the best general display, as regards variety, profusion, workmanship and utility combined, the Industrial gold medal should be awarded to Mr. William T. Garratt, for his display of Brass Goods, Steam Pumps, Bells, etc.

On comparing the several merits, many of which are highly commendable, claimed by the competitors for the most meritorious invention, it is our deliberate opinion, after mature reflection, that Mr. Charles H. Carter, of San Francisco, is entitled to the Inventors' gold medal, for his "Non-perforated, Fire-proof Metal Lath," an original Pacific coast invention, which, for excellence of design, manufacture, and usefulness in building, is endorsed and recommended, as we are assured, by twenty-five (25) leading architects and eighty-five (85) prominent house-builders in this city.

A. P. DIETZ, Chairman,
H. B. ANGELL,
JOHN HAMMOND,
JNO. AUG. REMER.

San Francisco, Sept. 6th, 1879.

With reference to the above awards, it is safe to say no fault can be found, even by competitors, in either class. The Inventors' gold medal is justly awarded to Mr. Carter. That gentleman obtained the patents for his inventions through the MINING AND SCIENTIFIC PRESS Patent Agency, and we are, therefore, familiar with these details.

The new metallic laths are made singly, and have a curved central portion with extending flanges, by means of which they may be attached to the wall. When placed side by side, the space formed between the raised portions of the lath produces a depression which forms the bend to hold the mortar inplace.

The machine for forming the laths is a simple though ingenious piece of mechanism. A sheet of metal of suitable dimensions is pushed under the plates from one side. The eccentrics, as the shaft is rotated, force the sliding plates down, thus forcing down the oppositely placed levers. These levers force down the upper edges of the swinging presser plates, the lower sharpened beveled edges of which squeeze the overlapping edges of the metal plates, from which the laths are formed down over the rounded edges of the former and into a crevice on each side. The eccentric again raises the swinging plates and separates their lower edges, releasing the lath, which may be drawn out and a new piece of metal inserted. The laths, thus formed singly, can be put upon any surface, and formed or bent to fit corners or angles, while they at the same time provide a perfectly fire-proof wall.

AN African King has abolished slavery throughout his dominions, liberating about half a million slaves.

A REPORT has reached Candahar that the Ameer has called upon the Chilzies to rise against the British.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

PLYMOUTH.—*Ledger*, Sept. 13: Davies & Co., purchasers of the Enterprise mine, are now pushing their work on the tunnel, day and night, and will soon strike the ledge about 120 ft below the surface. Thomas George and William Sharp are now working George's quartz claim. This claim is very rich in pockets, frequently paying as high as $50 per pan. They have taken out in the last two or three weeks several hundred dollars from one of the rich pockets in the claim. William Mathews has sold his interest in the Southern Phœnix for the sum of $1,200. It is thought here that the purchase is in the interest of A. Hayward, who now holds a clear title to the mine. It is also said that work on the mine will be pushed as fast as possible in the development of its hidden treasures, and that we shall soon hear the welcome sound of the 40 stamps of a new mill.

JACKSON.—At the Coney extensive improvements are being made. A large building is in process of erection over the hoisting works. Main building will be 100x30, and the shed 100x20 ft. The shaft is being retimbered. New timbers have been put in to the depth of 70 ft, and the work goes on at the rate of about one set of timbers per day. A set of timbers embraces four ft, and, as the total depth of the shaft is 650 ft, the only difficulty in the way now is water. A powerful engine is expected daily. The foundation of masonry is being prepared for its reception, and when this engine is started there will be no difficulty in keeping down the water. It will require two or three weeks to get the engine in position, and in the meantime retimbering will go on at the present slow pace. The mill site has been selected on a small knoll, just across the main road, and some 50 or 60 yards distant from the shaft. This, we understand, will be commenced as soon as the hoisting works are completed. Altogether, the aspect of things around the Coney is decidedly lively.

MOORE.—Work on a small scale was resumed in this mine Wednesday morning. Operations are confined to running a crosscut.

ITEMS.—D. T. Davies and others have located the Wildman mine in the town of Sutter Creek. The previous owners allowed the time fixed by law to elapse without doing the necessary work to enable them to hold their claim, and the locators above mentioned took possession. A number of men are at work developing the mine. The Lincoln mine cleaned up this week with satisfactory results.

VOLCANO ITEMS.—The regular clean-up of the Grass Valley gravel claim was finished this week, and realized $10,048, which amount L. McLaine brought down to Jackson on Tuesday, in the form of a gold bar, for shipment to San Francisco. A man named Davis has discovered what seems to be a very rich quartz ledge, a short distance from the Golden Gate mine. He crushed 70 lbs. of the rock in a mortar, and realized the sum of $40. We have not heard the width of the ledge. Parties in Volcano who have seen samples of the ore, say it is of as rich a quality as any they have seen taken from that district, so noted for its rich gold-bearing quartz.

IONE CITY.—*Dispatch*, Sept. 13: The proprietors of the Kirkendall mine, at Starvation Flat, are getting ready to put up a new mill and hoisting works on the mine, and will be ready to commence crushing rock in a few weeks. The rock taken out of the mine is said to be abundant and of a good quality.

BUTTE.

ITEM.—Oroville *Mercury*, Sept. 12: Mr. McSmith informs us that the company now working the Banner mine intend shortly erecting a new 15-stamp quartz mill. The contract for the machinery has already been let, and it is expected to arrive in a few days. Pending its erection the miners will be kept at work sinking another level.

INYO.

MEDECK.—*Independent*, Sept. 13: Crosscut from 300 drift north passed through about four ft of lime and manganese, and this morning has ore in the face of the same character as started on in the drift. This point looks very favorable for yielding a large quantity of ore. The face of the north crosscut, 1000, is in fine ground for ore, with every indication of soon striking it. Other points in the mine are looking as well as at any time heretofore. The north drift, 800, still following clay seam, and south drift, 1100, having good ground in face.

MAMMOTH.—The mill, which is now ready to steam up, is composed of a series of large wooden buildings, joined together and covering about a quarter of an acre of ground. Some 800,000 ft of lumber were used in their construction. All the rooms are large and well arranged for their respective purposes, giving storage under cover for a vast amount of wood and other bulky supplies during the long winter months. The machinery is massive, and of the most approved patterns throughout. The engine can be worked up to 250 horse-power, the cylinder having a diameter of two ft with a 4-ft stroke. The mill has 40 stamps, with pans, settlers, and every other necessary adjunct to correspond. The ore-house has storage for 2,400 tons, while the tramway to the tunnel mouth is all under cover, so that work can go on at all hours and seasons no matter how deep the snow may fall. The mine is in such shape that over a hundred men can be kept constantly at work stoping out, while the ore is so easily worked that each miner can knock down about five tons a day. Much of this falls in such large blocks as to require blasting before further removal.

PANAMINT.—Mining operations have been revived by the Leota O. & S. mining company. Thirteen bars of bullion, the result of the first six days' run from 50 tons of ore, were shipped from the Leota mill the other day.

REX MONTIS.—Work is going steadily along in the big tunnel, but some 500 ft more will have to be driven to reach the wide ledge known as the Potosi No. 4, when, there is good reason to anticipate, good paying ground will be opened.

MODOC.

NEW QUARTZ LEDGE.—The *Silver State* says that, near Fort Bidwell, a quartz ledge has been lately discovered cropping up at intervals of five and 10 miles for a distance of fifty miles. The specimens exhibited have been declared by experts to be extremely rich.

MONO.

MARYLAND CON.—*News*, Sept. 14: Main shaft now straightened to the depth of 120 ft in two compartments and timbered a distance of 100 ft. Are at work upraising from the 258 level to connect with shaft above, the surveys having been made and everything got in readiness for speedy connection. A crosscut has been started southwest from the 258 station and has been advanced a distance of 27 ft. During its course several seams of quartz have been cut with quantities of clay mixed with quartz, the former horning out well in gold. The winze on south drift from shaft is now down 6 ft on the ledge, which is followed down on a splendid foot wall separating a vein 3 ft in width from the country rock. There are now about 250 tons of fair-grade ore on the dump, and more can be extracted when the work of straightening the shaft and getting matters generally in working order shall have been completed. In and about the mine there are now 45 men listed on the pay roll, and the work is being carried forward by three shifts of men night and day. The new building is completed, and is 40x78 ft in size, with a boiler room adjoining, 30x20 ft. The engine is a double cylinder, 9½x14 in., with drum 4x5 ft in size on which 1,500 ft of wire rope can be wound. The drum alone weighs four tons, which will give some idea of the size of the machinery, and the whole arrangement shows compactness and strength united with speed and capacity. The boiler is placed on the east side of the main building, and is of sufficient capacity to run half a dozen such engines as are needed in the mine at present. Connected with the machinery is a force pump which is capable of throwing a stream of water over the works, and can be used in case of fire breaking out. Near the works the company have a neat and cozy office, arranged with rooms for the superintendent and foreman, and fitted up with all requisite conveniences.

STANDARD.—North drift 385 level is in 378 ft. The ledge in the drift is 2½ ft wide of good ore. The west crosscut from this drift is in 28 ft, and during the week cut through a fine-looking ledge 2½ ft wide, this crosscut being 340 ft north of the series of ledges intersected by the main east crosscut from this shaft. We intend to continue it and thoroughly prospect this ground. The face is at present in very hard rock. The ledge in the stopes is looking very well, particularly in the south end, where the ledge is 10 ft wide of very rich ore. Since last report have started a south drift from the main east crosscut 126 ft east of the shaft. Have run this drift 10 ft, showing a ledge 6 ft wide of good ore. The south drift 550 level is in 72 ft. The ledge here is 7 ft wide of good milling ore. The upraise from this ledge has reached a height of 140 ft, the ledge being about 8 ft wide of good ore. It is expected to make a connection between this upraise and the north drift 385 level in a short time, which will give us better ventilation throughout the lower workings on the veins. The west crosscut 300 level is in 81 ft in very hard blasting rock. The ledge in the stopes 550 level is from 8 to 12 ft wide of good ore. In the Gildea the ledge is about 4 ft wide, and is looking very well. The work on the pumping machinery is progressing finely. The tank station at 615 ft is finished, and we will in a few days have the work on the bob station at 530 ft completed, after which we will commence to put in the pumps, and will have this work nearly if not entirely finished by October 1st. The new mortars for our mill are now in place, and give entire satisfaction.

J AND K.—New double compartment shaft now down 145 ft and still sinking. It is expected to encounter the ledge followed down in the old shaft at a depth of about 170 feet, when the work of ore extraction will commence. Ground being worked is very hard in places, but it is expected to get into softer material as depth is attained. We were shown several specimens of rock which were found on the surface, some of which carry free gold in considerable quantities, and are certainly indicative of the presence of a valuable ledge. The building is up and will soon be roofed in.

BODIE TUNNEL.—Tunnel is now in 1170 ft, 15 ft having been made during the week past. On Friday last a vein of gold-bearing quartz was cut at 1,065 ft, measuring about four inches in width, which on further development may prove valuable. The fact of having encountered a mass of iron-stained porphyry indicates the near vicinity of another vein of quartz, that sign having been an infallible indication in the previous working.

SOUTH NOONDAY.—Main shaft down 70 ft. Winze on the vein, going down from south drift, has been advanced to a depth of 14 ft, showing the ledge 4 ft in width in the bottom. The solid and bright character of the rock found in this vein is most encouraging for a permanent ledge, and its easterly dip and regular course are evidences of great strength.

AJAX.—Sinking main shaft with vigor and persistence, and the work progresses rapidly considering the hardness of the rock in the bottom. Total depth of shaft 120 ft, 15 ft having been made during the week passed. Large amounts of quartz are being encountered as the shaft progresses downward, indicating that a strong vein of gold-bearing quartz will be found at a depth.

BOSTON CON.—Work has been confined during this last week to timbering the shaft and erecting the whim house. The depth of the shaft is now 90 ft, and is thoroughly timbered. The whim will be finished by the end of next week. At the bottom of the shaft the fissure is considerably wider than the shaft. Of the ledge matter being taken out, about 2½ feet is of good milling quartz, and the balance is clay, intermixed with some porphyry. The 10-inch ledge which went into the hanging wall last week is separated from the main ledge by a horse. The shaft is being sunk on the main ledge, passing under the 10-inch ledge.

GEODSHAW.—Have made a distance of 15 ft in the south drift on vein No. 2 from main east crosscut on 450 level since last report. Are engaged cutting out station for tanks at 250 and 450 levels.

CON. PACIFIC.—Since last report the shaft has been sunk 22 ft, making a total depth of 323 ft. The bottom of the shaft is now in a ledge formation which fills the shaft in width. The quartz is of a peculiar character, carrying considerable gold and some silver, mixed with decomposed quartz and clay. The fissure is widening, and the filling is becoming less mixed with clay and extraneous matter as greater depth is gained.

TIGER MINING DISTRICT.—The Stockton *Independent* says: We were yesterday shown specimens of rich ore from the claim of Messrs. Hoag & Klefiher, Tioga district, Mono county. This is a newly-discovered mineral region, near the summit of the Sierra Nevada range, and from reports that we have from parties who have visited the locality, there is every reason to believe it one of the richest ever discovered. We are informed that the width of the lead has not yet been ascertained, although in the mine of Messrs. Hoag & Klefiher a shaft has been sunk for about 30 ft, and the crosscuts run for 24 ft without reaching the hanging walls. The rock is full of metal, and assays from $80 to $600 per ton, and from present indications it is practically inexhaustible. The lode is located near a timbered region where there is an abundance of wood and water to supply works for the reduction of the ores. From the accounts we receive from this district we are lead to believe that a bonanza has been discovered, and that at an early day steps will be taken for its development.

NEVADA.

ITEMS.—*Foothill Tidings*, Sept. 13: Over one hundred men are employed underground at the Derbec mine, near North Bloomfield, and ever 200 carloads of gravel are daily raised from the shaft. The mine is looking well. The Merrifield mine, which has been closed for a time to make some needed repairs, and to put in Frue concentrators, started up again Monday. The four-stamp mill which Messrs. Richards, Martain and Waters have erected at their mine at Canada Hill, was started up on Saturday. The Yuba quartz mine, situated seven miles above Washington, has been sold by Coleman Brothers & Co., the former owners, to A. DeLand, R. H. Lloyd, Col. Rogers and other San Francisco capitalists. Mr. DeLand is to be the Superintendent. The claim has a good 25-stamp mill upon it. It has been worked through a tunnel with good success for several years past. The new company propose to run a crosscut and push operations ahead as rapidly as possible. The winter supplies of provisions and tools have arrived here and are being sent up. Washington mining district has never had so good prospects as now.

NEW STRIKE.—*Transcript*, Sept. 14: While preparing to lay a foundation for his new house on Piety hill, near the site of the old flouring mill, yesterday morning, Mr. Oliver struck a six-inch ledge of quartz about 18 inches below the surface. The rock is rich in free gold and sulphurets. His son and John Rodda located a claim immediately after the discovery, and commenced work on it. The ledge extends north and south. Its presence near there has been suspected for several years past, and various parties have prospected for it without success.

ITEMS.—*Union*, Sept. 13: It is given out that the Deadwood quartz mine, at Nevada City, will commence paying regular dividends in November. Sixteen quartz mining companies are operating in the Nevada district, and some of them on an extensive scale. New machinery is now being put up on three of them. Quartz mining is more promising in that district now than at any previous period.

GEM MINES.—The *Transcript* in a late issue says: Twenty-one tons of rock from the Bulldozer and New Constitution mines on Deer creek (both owned by the same parties) was crushed at the Deadwood mill Friday and yielded $16.64 per ton, exclusive of the sulphurets, which will also pay a fair sum. The gold is of very good quality. These claims are both worked by their owners. The ledges in each of them have increased to 14 inches at the lowest point developed.

SELBY FLAT GRAVEL MINE.—We understand that negotiations have about been perfected whereby the present owners will sell to a San Francisco party the well-known Selby Flat gravel mine about a mile nearly north of Nevada City. The property is now idle, but the new purchaser will immediately make arrangements to work it for all it is worth.

THE DERBEC MINE.—The Derbec mine never presented better than it does now. The drifts are looking splendidly. The new gravel washing machine will be ready to start up this week, and by its use the large amounts of gold lost in the common process of washing will doubtless be saved.

THE IDAHO MINE.—The Idaho, at Grass Valley, paid its 121st dividend of $3 on the 1st. In August it produced $33,598, and a surplus of $20,206 was carried over.

PLACER.

ITEMS.—Placer *Herald*, Sept. 13: The fame of the Hidden Treasure drift mine, at Sunny South, grows brighter with time. Though it has been a paying mine since gravel was first struck, it pays better as they proceed up the channel, and shares, of which we believe there are 36, gradually advance in value as development proceeds.

A STRIKE IN THE MOUNTAIN GATE.—Some time ago the channel in the Mountain Gate drift mine, at Damascus, was lost, and in prospecting around trying to find it again they came recently on to a channel of a different formation, running angularly across the course of their old channel. It is plain now that the old channel is cut in two by this latter channel and by following the direction of the old channel across the now one they will come into their wanted rich gravel again. The gravel in the new channel, however, is, we understand, very rich, though lying too low to be drained through the present tunnel, it can only be worked under great difficulties. The new channel struck is supposed by some to be a branch of the big channel that crosses the ridge from the north to the middle fork of the American river.

SIERRA.

ORIENTAL CON.—Nevada City *Transcript*, Sept. 14: Tom Peard, the new foreman of the Oriental Con., says that the mill (10 stamps) will crush 25 tons per day, and that with six good men he turns out enough ore to keep it going right along. He thinks that 20 more stamps should be added immediately, for it will be no hard matter to extract 75 tons per day regularly. The two drifts on the 600 level are looking well, and the ore body is improving with each day's work. A large clean-up made a few days since shows that the rock pays from $7 to $8 per ton, growing better in descending. There is already enough ore in sight to supply the mill for many months. The Kentou mine, which was shut down a few days since because of some trouble with the miners, is to be started up again this week, and Tom will also direct the underground operations of it in addition to his duties at the Oriental.

NEVADA.

WASHOE DISTRICT.

UNION SHAFT.—Gold Hill *News*, Sept. 17: The shaft is being carried down from the point of connection with the raise from the 2300 level (Sierra Nevada 2200 level) at the rate of over a set of timbers per day, and at the same time excavations below are being made the full size of the shaft, to facilitate operations.

MEXICAN.—A raise has been started from the 2300 level to meet the joint Ophir winze from the 2100 level, the connection being desirable for ventilation.

JULIA CON.—The accumulation of water in the mine has been greatly reduced. The new set of boilers has arrived and is being put in place as expeditiously as possible. As soon as the water is out work will be resumed in the winze below the 1300 level.

OPHIR.—The work of cutting out the 2400 station of the incline will be completed by next Saturday, when sinking will be resumed. The sump is 40 ft deep and the bottom shows the same formation of low grade quartz. The north drift, 2100 level, which is following the Hardy vein, is in good milling ore, the formation being from 4 ft in width to that of the whole face of the drift. The face of the joint Mexican crosscut, 2000 level, continues in soft vein matter carrying quartz of low grade.

ALTA.—The west drift from the station, 1550 level, is in 90 ft and in better running ground. Some ore is still obtained in the raise from the 1550 to the 1450 level.

CON. VIRGINIA.—An average of 2 ft per day is being made in the raise east of No. 2 winze, 1650 level, the material passed through being vein porphyry. Having reached a point 200 ft east, the crosscut on the 2150 level has been stopped. The south drift on this level is making 3 ft per day; total length, 280 ft. This drift will now be continued till connection is made with the joint Best & Belcher winze from the 1900 level.

CON. IMPERIAL.—The two crosscuts on the 2600 level are now being pushed with greater energy, the faces continuing in vein porphyry cutting very promising streaks of quartz.

BULLION.—The north drift, 2400 level, is being advanced at the rate of 4 ft per day through vein matter carrying quartz of a very promising character; total length in Bullion ground, 97 ft. The winze from the 2150 level is penetrating hard rock; total depth, 135 ft. The connection between the 2000 and 2135 levels of the Con. Imperial has somewhat improved the ventilation in the mine.

EAST BONANZA.—Since last report the incline has been timbered up and yesterday sinking was resumed; total depth, 85 ft. Some fine-looking rock was found where the ledge was broken into, from which assays of from $10 to $20 were obtained. The old tunnel is being pushed ahead as usual.

LEVIATHAN.—Face of south lateral drift on the 750 level in hard porphyry and quartz, with streaks of clay. Blasts poorly. The lateral drift north on the same level shows a mixture of low-grade ore and porphyritic ledge matter. Better progress is now being made in this drift than the other, and the ore indications are the most favorable.

OVERMAN.—The strong flow of water encountered in the face of the north drift, 1900 level, is decreasing, and at the same time the amount running into the winze from the 1600 level to the 1900 level is also lessening. The former is draining the latter.

LADY BRYAN.—The incline raise from the 750 to the 600 station is up 50 ft. From the face of the drift south from which this raise is being made a crosscut has been started east, the face of which is in quartz assaying from $7 to $8. The north drift on the 750 level is getting into softer ground, composed of quartz and porphyry. The south drift, same level, is also in porphyry and quartz. The east crosscut from the north drift on the 600 level is in porphyry containing streaks of quartz assaying $3 or $4. The west drift from the south drift is in a mixture of clay, porphyry and quartz, yielding low assays.

CALIFORNIA.—The ore vein encountered on the 2150 level is being followed both ways, and both drifts are in good ore, the vein being four ft in width.

BELMONT DISTRICT.

BELMONT.—*Courier*, Sept. 13: Our stope south of winze continues to look well, and from which we are extracting high grade ore. No. 4 raise from 800 was advanced 22 ft during the past week through a vein of quartz averaging 3 ft in width, in the center of which is 4 inches of fine ore.

GILA.—The south drift, winze No. 2, which was sunk 6 ft during the past week shows in the bottom a vein of 3½ ft in width, a part of which is rich and all good milling ore. The drift from winze has still a wide vein of low grade ore. The stopes are yielding their usual quantity of ore, more than sufficient to keep the mill running.

BRISTOL & PIOCHE DISTRICT.

MAYFLOWER.—*Record*, Sept. 13: The winze now down 92 ft below the 130 level; total depth from surface, 222 ft. The bottom of the winze shows 5 ft of solid ore; four assays taken from this ore Wednesday show an average of $34 in silver per ton. A station will be opened at this point and drifting commenced in the ore body to develop its extent and get ready for stoping and shipping ore to mill. From an ore body recently struck in the mine rich chloride ore has been taken out. It is of a very light yel-

[CONTINUED ON PAGE 188.]

The Auriferous Gravels of California.

[A paper read before the California Academy of Sciences, Monday evening, September 15th, 1879, by W. A. GOODYEAR, M. E.]

In the year 1871, the writer, as an assistant on the State Geological Survey of California, under Prof. J. D. Whitney, spent about six months of active field-work in a careful investigation of that portion of the auriferous gravel region of California which lies between the north fork of the American river on the one hand and the Mokelumne river on the other, including the greater portion of Placer county and the whole of El Dorado and Amador counties, so far as these ancient gravels extend from the very base of the mountains, along the edge of the Sacramento valley, northeastward towards the crest of the Sierra Nevada range.

This investigation was constantly accompanied and checked on all important questions involved in the complex problems to be solved by instrumental measurements and observations, as accurate as could be made with such instruments as are portable for a man traveling in the saddle, and especially by a continuous series of exceedingly numerous observations for altitude with the best mercurial barometers.

It is safe to say, that no other equally extensive portion of the gravel region of California has ever yet been so carefully and systematically studied by any single person. I am also tolerably familiar with the gravel formation so far as it extends in Calaveras county, and have at various times visited many other localities in Nevada and Sierra counties and elsewhere.

I believe that my field-work in 1871 sufficed beyond all reasonable doubt to solve, *in general terms*, the whole problem of the dynamic origin of the ancient auriferous gravels of California.

During the last eight years, however, I have written nothing for publication upon this subject, not because of the absence of temptation to do so, but because I have been restrained therefrom, first, by the consideration that this work having been done in the service of the State of California, its results were the property of the State, and ought to make their appearance only in such manner, and through such channels of publication as the State might deem fit to provide; and second, since the State for seven years now has declined to make provision, either for any further investigation of her resources in this direction, or for the publication of the results which had already been obtained, I have felt that if any single individual possessed under such circumstances a stronger claim than another upon the results of my own work, that individual was Prof. Whitney, who was State Geologist at the time, and under whose direction and supervision the work itself was done.

But circumstances change, and after the lapse of eight years, the regents of the University of California having some time since given permission to Prof. Whitney to use so far as he could for purposes of publication, the material which he had previously accumulated, the Museum of Comparative Zoology, at Cambridge, Massachusetts, has furnished the financial requisites for the publication of part of this material. And consequently a large pamphlet (288 pages of somewhat larger size, but otherwise very similar in general style of publication to the previously published reports of the State Geological Survey of California) was published early in April, 1879.

This pamphlet constitutes the first part of No. I., Vol VI., of the Memoirs of the Museum. Only 300 copies of it were printed, and these are exclusively at the disposition of the Museum, and will be distributed to those on its regular exchange list.

It is the first portion of a volume on "The Auriferous Gravels of the Sierra Nevada of California," by Prof. J. D. Whitney.

The pamphlet already published contains a large part of the results of my work in 1871. But this part consists chiefly of a detailed statement of observed facts, without, however, including any results of the barometric computations of altitude, and the whole matter of a general discussion of the dynamic history, and the *modus operandi* of the accumulation of these gravels is deferred for the latter part of the volume.

The remainder of the volume was promised in a few months. But in the meantime, after more than 25 years of mining operations among these gravels, all sorts of theories are yet rife as to their origin, and nobody seems yet to know exactly what to think of them.

I therefore propose now to present a few of my own ideas upon the subject gathered from my experience in the field, premising, however, that nobody is responsible except myself for any theory that I may offer. I would say, furthermore, that if in anything which follows I should appear to speak too much after the style of one who teaches with authority, it is not because I wish to do that, however confident I may be of the truth of my observations, but because I am studying brevity, and wish to present my ideas in the shortest possible shape.

The problem of the auriferous gravels of California is certainly one of the most complex and intricate in its details of all the questions that have ever puzzled geologists in this or any other country. Yet its solution, in broad terms, is comparatively simple.

Nothing like the old "Blue Lead" theory will ever account for it. The idea either of one or several great rivers running for long distances in a direction nearly parallel with the present axis of the Sierra Nevada, is a myth that can never be substantiated. The supposition that the Columbia river ever came through there is simply absurd; and the propositions that these gravels are the work of glaciers, or that they are deposits made in the bed of a lake or sea are equally untenable.

The whole character of these gravels when studied in detail, proves beyond a question, that they are the work of running streams of fresh water. The question is, whence came these streams, in what direction did they run, and how did they act, and what has been the history from that time to this?

I proceed to give that history,—not in the complexity of its details, many of which will never be unraveled,—but as I have said before, in broad and general terms.

As I do not propose to discuss particularly in this paper the lithological or other characteristics of the rocks which, constituting the main mass of the Sierra Nevada, underlie the gravels, and whose degradation furnished the materials of the gravels themselves, I shall here include them all in the one general and convenient name of "bedrock," without distinction as to whether they consist (as they do in different localities) of metamorphic slates and sandstones, or of limestone, or of granite and its kindred rocks.

The first proposition, which it now becomes necessary to clearly set forth, is a most important one, inasmuch as it underlies the whole explanation of the gravel system. It consists in the simple fact that, contrary to what has been a very widely received opinion, the western slope of the Sierra Nevada has not been subjected to any considerable movements of elevation or depression since the commencement of the gravel epoch. I speak now of the bedrock. There are, of course, many localities, especially in the northern portion of the Sierra, where great additions have been made to the hight of the range by the enormous mass of volcanic materials which has been piled on top of it. But tremendous as the volcanic energy was for a period, its seat of action lay almost exclusively to the eastward of the gravel region, which was merely overwhelmed with its debris and occasionally shaken by its earthquake throes, without, however, sustaining any considerable change in position or altitude of the bedrock.

This being the case, it is seen at once that the *general* direction of the drainage of this region throughout the period of accumulation of the auriferous gravels must have been southwesterly, the same as now. And the character and distribution of the gravels themselves, together with the directions of the ancient channels, wherever these can still be definitely traced in the bedrock, proves beyond a doubt that such was indeed the fact.

But, in other respects, this drainage took place under circumstances which were very different from those which exist to-day.

At that time no canyons of any considerable depth existed here, and the western slope of the Sierra was a broad and moderately hilly region 50 or 60 miles in width, having a general average inclination of something like a hundred feet to the mile in a southwesterly direction from near the crest of the range to the edge of the great valley of California, which was then in all probability partially occupied by an extensive but very shallow lake or inland sea.

The hills were not very high, rarely rising more than 200 or 300 feet (oftener far less) above the beds of the adjacent streams. But there were occasional ridges and ranges of hills which rose much higher, sometimes even 1,000 or 1,500 feet above the immediately surrounding country.

Such, for example, is a conspicuous range or series of bedrock hills, which still stretches in a southwesterly direction from near the crest of the range along the divide between the south and middle forks of the American river, nearly to Georgetown in El Dorado county.

Another prominent example of the same kind is the "Bear Mountain" ridge in Calaveras county, which consists entirely of bedrock, and is situated very low down on the western slope of the Sierra, extending nearly parallel with the axis of the range, and in an almost unbroken ridge southeasterly from near the Calaveras river to the Stanislaus.

The situation of this ridge is such that it has formed a kind of dam or barrier, to which I shall refer again hereafter.

The outlines of the whole drainage basins of the larger streams during the gravel epoch were of course marked by the lines of these exceptionally high ranges of hills, and wherever these ranges were high enough to tower above the general flood of volcanic *debris*, which subsequently buried the gravels, there the same ranges still continue to mark the outlines of the larger drainage basins of to-day, and to that extent the present drainage system is identical with the old.

But, as already stated, throughout most of the country the hills were low, and among these lower hills meandered the streams in whose channels the ancient gravels were accumulated. These streams were, of course, extremely crooked, as was necessarily the case in a country so situated, where there was almost absolutely no plane surface, but all was more or less undulating. Their general direction was southwesterly. But they often ran for short distances towards every imaginable point of the compass, even something directly northeast towards the crest of the Sierra. Similar cases can be found among the streams of to-day, but they are not so common as they were then. Of course, there were occasionally places where for several miles even the larger streams themselves would run south or southeast—*i. e.*, nearly parallel with the axis of the mountain range, before turning again southwest in their course towards the valley. This was particularly the case in the region northwest of the Middle Yuba river. And this circumstance has been the only basis for the old "Blue Lead" theory, the central idea of which was that one or two or three great rivers had once flowed for hundreds of miles along the western slope of the Sierra in a direction nearly parallel with its crest.

One notable case of this kind (involving no great distance, to be sure, but enough to illustrate the matter) is that of the ancient and modern north forks of the American river. The ancient fork at one time ran from the vicinity of Gold Run, or a little below, and somewhere about Indiana Hill or Illinois Hill, for a number of miles in a direction south or a little east of south through Iowa Hill, and near Wisconsin Hill, to a point somewhere in the neighborhood of Forest Hill or Yankee Jim's, in Placer Co., where it met the old middle fork, and there turned again southwest. The modern fork flows from a point one or two miles northeast of Colfax, in a general direction a little east of south for five or six miles, to the mouth of Shirt-tail canyon. This is indeed a remarkable, and in this region an uncommonly close case of parallelism between the ancient and modern streams. But the only point which I wished to elucidate here was, that the fact of the ancient streams having sometimes flowed for several miles in a south or southeasterly direction has been the occasion and the basis for a "Blue Lead" theory which for many years has misled the people and befogged the whole matter.

The streams in whose channels the ancient gravels were accumulated were generally shallow. Here and there channels were excavated into the solid bedrock to depths of from 100 to 200 feet or more. But these were rather the exceptions, and not the rule.

The streams themselves were in all probability subject to greater variations in the quantity of water which they carried at different times than are the streams of to-day. For example, a stream which at one time only contained water enough to enable it to transport small quantities of sand—or possibly nothing at all unless it were the finest clayey silt—would at other times be subject to heavy and sudden floods which would hurl along great quantities of coarser materials, including sometimes boulders of many tons in weight, a large portion of which materials would, in case of an equally sudden subsidence of the flood, be left behind, and might either be scattered for a considerable distance along the bed of the stream, or, if the stream had overflowed its banks, might be spread broadcast over a portion of the adjacent country.

There can be no question about the power of water—even on slopes of less than one-half of a hundred feet to the mile—to transport boulders as large as any that are found in the gravel region, provided only that the volume of the water be sufficiently great and its rush correspondingly rapid. Nor would it require much time for such a flood to transport heavy materials to considerable distances. It is more than probable that such occurrences were not uncommon during the gravel epoch.

I will call attention here to another point. In those numerous cases where great and broad channels have been found excavated in the solid bedrock by the ancient streams to depths of from 100 to 200 feet or even more below the rim rocks on either side, it is not fair to assume that the same stream had at any one time the same depth of channel throughout its course. On the contrary, it is far more probable that even while these streams were flowing in the deepest parts of their rocky channels, the same streams were in other parts of their courses running between low banks, which in many cases were not high enough to prevent frequent overflows.

But floods heavy enough to transport large boulders occurred only at intervals, and were of short duration; and on the whole, the process of accumulation of these gravels was a slow one, and humanly speaking a very long one. It is not at all unlikely to have occupied hundreds of thousands of years.

I see no necessity, however, for supposing that any long period of excavation preceded a distinct and subsequent period of accumulation. It is certain of course that at any point where the bedrock has been excavated, the excavation at that particular point must have been finished before the same point was finally buried beneath the growing accumulations. But I see no reason why in different localities the two operations should not have proceeded *pari passu*, excavation occurring at one place, while at the same time accumulation was progressing at another. Indeed when we consider the varying grades which the ancient streams must have had, as well as the ever-varying conditions which attended their existence, it seems more than probable that such was the case from the beginning.

These streams flowed at first on the almost naked surface of the bedrock, and necessarily sought the lowest channels they could find among the inequalities of that surface. The portions of these channels which first became filled with debris, were those where the grade of the streams was gentlest and where, as an ordinary rule, the current was most sluggish. When, however, these portions of a channel had become filled to a certain hight, *i. e.*, up to or perhaps a little above the general level of the lower portions of the surrounding country, then the banks no longer proving high enough at all points to restrain the current, the stream at some point or other would burst through or over them, and thus leaving its old bed dry, would seek out a new channel for itself among the adjacent knolls and hills for a distance which might vary according to circumstances, from a few rods to several miles. The new channel would be crooked like the old one, and in due course of time would become filled in its turn with debris, when the stream would again burst its banks and choose still a different course. And thus the process went on slowly but surely, not with one stream merely nor with several, but with the hundreds, nay, the thousands of streams that constituted the whole drainage system of the mountains, until at length, over extensive regions, all the lower depressions were filled with gravel, the lower knolls themselves were covered with it, and as its depth increased, it crept steadily higher and higher up against the sides of the larger hills, and every square foot of the buried surface of the bedrock was worn and smoothed by the streams which brought its gravel covering.

It will readily be seen that in the later stages of such a history, and after the accumulation of gravel had already become considerable, it would have been no uncommon thing for one of these shifting streams, in changing its course, to choose a new one directly or obliquely across the top of an already filled and more ancient channel. In such a case, the new stream might either begin at once to deposit a new accumulation of gravel on top of the old one, or, what is quite as probable, it might first excavate through the older deposit a new channel of greater or less depth for itself, which channel would then be subsequently filled by later accumulations in its own bed, the question whether a given stream, at a given locality, and a given time, would act as an excavator or a depositor of material being determined partly by existing accidents of local topography, but probably very largely also by certain transitory conditions of the stream itself, such as the volume of water which it carried for the time, and other circumstances, which have left no discoverable intelligible record behind them, and which no man can ever hope to fully trace out.

Such occurrences were in fact extremely frequent during the gravel period, and it is this fact more than all others which has produced such infinite complexity and apparent confusion in the present structure of the gravels, and rendered the whole problem so exceedingly intricate in its details and so difficult to solve.

Thus, in the course of ages, the auriferous gravels were accumulated and irregularly distributed over the broad expanse of the western slope, from the very foot of the mountain range up almost to its towering crests.

In many places, of course, the gravel was not very deep, and there were extensive areas which probably never had more than a foot or two of gravel distributed over them. But in other localities, where the topography was favorable, and the larger streams had an opportunity to work uninterruptedly and with but little change in their position for immense periods of time, the accumulations were enormous, and many square miles of country were buried to depths of from 200 to 300 feet and sometimes even deeper still.

But at last there came a change, and the outbursts of the grand volcanic epoch of the Sierra Nevada announced the end of the gravel period. And yet, the western slope of the Sierra was never flooded with liquid fire. On the contrary, true lava streams are among the rarest of the phenomena to be found there. The Tuolumne County Table mountain is the most noted and conspicuous instance of an extensive lava flow within the limits of California. But aside from this stream there is not, so far as I know, another noteworthy instance of the kind to be found on the western slope of the Sierra, between the Tuolumne and Feather rivers. Immense as is the quantity of volcanic materials spread over this region, it is all fragmentary in its character, and nearly all of it has been transported and distributed through the agency of water. It consists of all sorts of volcanic debris, from beds of the finest ashes and volcanic mud up to the coarsest breccias and conglomerates, which often contain boulders of many tons in weight.

The method in which the volcanic agencies put an end to the gravel period, was simply by flooding the whole country, over which the gravels had previously been accumulating, with successive flows of volcanic muds and debris of all sorts. But this was not accomplished all at once. On the contrary, it was a gradual process and occupied a very long period of time.

In proof of this, there may here and there be found (as for example, near Placerville) heavy beds of true volcanic gravel, *i. e.*, of gravel in which nearly all the pebbles consist of volcanic rocks, but are as completely smoothed and rounded by water as any of the pebbles in the auriferous gravels themselves, thus showing that time was afforded for streams to wear the rocks and manufacture gravels. Again, it is not rare in some parts of the country to find that, long after the commencement of the volcanic period,

a bed of true auriferous gravel, derived from still uncovered bedrock somewhere higher up in the range, has spread itself extensively over the top of heavy masses of previously accumulated volcanic materials, and then been subsequently buried by still far heavier masses of similar volcanic origin.

It is probable that during the latter part of the volcanic epoch the discharges became heavier and more frequent, affording less and less opportunity for running streams to work uninterruptedly, and producing heavier and heavier floods of volcanic breccias, muds and ashes.

But, at last, the volcanoes died, and then the modern streams began their work.

The surface of the country, however, was greatly changed. The ancient gravels were now buried to depths ranging from 100 feet, or less, to 1,000 feet or more beneath a mass of volcanic detritus, which spread in an almost universal sheet of varying thickness from the crest to the foot of the mountain range, and even to some extent into the valley of California. As a general rule the thickness of this volcanic sheet decreased from the crest of the mountains towards the valley, and there were undoubtedly considerable areas here and there among the foothills which were never covered by it. Also in the regions of middle altitude there were occasional old bedrock hills and peaks which projected above its general level, and were therefore never entirely covered by it; such, for example, are the bedrock hills already referred to on the divide between the south and middle forks of the American river, above Georgetown, in El Dorado county. But even in the middle parts of the western slope, and still more in the higher parts of the range, all the lower portions of the country were deeply buried. Throughout the basin of the middle fork of the American river, the depth of this volcanic capping ranged from 300 to 800 feet, and places can be found nearer the crest of the range where its depth reaches from 1,500 to 2,000 feet.

It is easy now to understand how the higher ranges of bedrock hills originally scattered here and there over the western slope, and whose tops still projected above the volcanic capping, should serve, wherever they occurred, as in the case of the range already twice mentioned, on the divide above Georgetown, to mark and determine the outlines of the larger drainage basins of the new system, precisely as they did in the case of the old. It is also easy now to see how the Calaveras County "Bear Mountain" ridge has served as a complete barrier, not only to the ancient gravel streams themselves, but also to all the subsequent floods of volcanic matter, so that neither volcanic matter nor ancient gravel can now be found among the foothills southwest of this range, though they are plenty to the northeast of it, and also among the lowest hills about the Calaveras and Stanislaus rivers, at both ends of the range. The reason is precisely the same which caused both these rivers, which drain the country back of this range, to flow around its ends instead of cutting through it, viz., it was too high for them to surmount.

As a general thing the surface of the country at the close of the volcanic period was far smoother, and approached much more nearly to a plane surface than it did at the commencement of the gravel epoch, or than it had ever previously done. A most striking illustration and unquestionable proof of this fact still remains visible to anyone who has opportunity to examine it in the basin of the middle fork of the American river.

A magnificent view over the top of this whole basin can be obtained from the summit of a peak called Bald mountain, near Canada hill, in Placer county. This peak is some 5,000 or 6,000 feet above the sea, and from its summit the basin of the middle fork *looks* precisely like what it *was* in reality at the close of the volcanic epoch, namely, like a broad, smooth and gently sloping plain, over which one might easily drive anywhere with a carriage and four, were it not for the timber which covers it. The cause of this appearance is, that time enough has not yet elapsed for the degradation of the ridges which exist between the present streams, and that the crests of most of these ridges still rise to just about the level of the ancient surface-plane, while none of them rise above it, except the outer hills which form the circumference of the basin.

But to one who has actually traveled through this basin, and knows what a perfect labyrinth of tremendous canyons it really is to-day, the impression of such a view is one never to be forgotten, and the connection between the remote past and the present time seems strangely close and intimate.

Over the top of this smoothly sloping plain of loose volcanic debris, the new streams at the close of the volcanic epoch were obliged to find their way.

They ran at first almost at random, their course being modified by the slightest inequalities of the surface. But the general southwesterly grade was a steep one for rivers, and the materials were then very loosely compacted if at all, and the streams soon began the work of excavation. After a time, they had cut their beds deep enough into the volcanic detritus to restrain even the heaviest floods within their banks, and from that time on, the work proceeded with greater rapidity and power. At last they reached the buried auriferous gravels, and then the solid bedrock beneath them. But, by this time, they were already running in sharp V-shaped canyons from 300 to 500 feet or more in depth. They were subject at times to heavy floods, and at such times transported vast quantities of debris, and of course they began at once to cut their way into the rocks themselves. From that time to this, under varying conditions of climate, etc., the process has continued, resulting in the formation of the modern canyons, which often range from 1,500 to 2,500 feet in depth,—of which depth, usually more than two-thirds, and oftentimes more than three-fourths, is excavated in the solid bedrock beneath the ancient gravels.

Such is the general outline of the history of the ancient auriferous gravels, which constitute the hydraulic mines and the "drift diggings" of California. But the complex and intricate details of that history will never be fully unraveled by man. Where the accumulations of these gravels were great and deep, and where the volcanic capping has been subsequently removed or was never very thick (or, as is probable at some localities, never existed at all), there we find the great hydraulic mines. Where the gravel was shallow, but rich, and was covered by a heavy mass of volcanic materials which has never since been removed, there we have the "drift" or "tunnel diggings."

I cannot here present the facts and the overwhelming evidence to sustain a great portion of what I have said, for the simple reason that such a presentation would require a volume.

I will, however, before I close state some of the evidence which goes to sustain the important proposition that the bedrock of the western slope of the Sierra Nevada has not been subjected to any considerable change of altitude since the gravel period. The considerations, which I shall here present, are three in number:

First, it is difficult to believe, and in the absence of positive evidence, it is extremely improbable, that a great mountain range like that of the Sierra Nevada, which in the course of its previous upheavals has been so thoroughly crushed and shattered in all directions, should in this later stage of its history have undergone any considerable change in its altitude from the action of subterranean forces of any kind whatever, without the occurrence of numerous local faults and disturbances of various kinds, which if they had taken place since the deposition of the gravels, must necessarily have produced corresponding disturbance in the gravels themselves. But the fact is that anything like faults in the gravels, or appreciable local disturbances of any sort in the bedrock underlying the gravels since the deposition of the latter, are among the rarest occurrences to be found in the gravel region.

I have, indeed, seen such things, and I always watched for them. But among all the hundreds (and more probably several thousands) of miles of my travels up and down in the gravel region, I never saw more than half-a-dozen such cases, and several even of these few cases were very indistinct and uncertain in their character. By far the best marked instance of the kind which I ever saw was at Yankee Jim's in Placer county. There was here a distinct and unmistakeable fault cutting both the bedrock and the overlying gravel. It involves a sharp displacement, or jump, of from 12 to 15 feet, and could be traced for several hundred yards, across the hydraulic ground. But even this was far inferior in extent and general magnitude to some of the disturbances caused in Owen's valley by the single earthquake of March 26th, 1872, which, among other things, produced a single fissure or fault which I saw in the summer of 1873, and which could then be traced for 20 miles along the western side of the valley, and which at many localities involved a displacement of from 15 to 20 feet.

Second, if any notable elevation of the range as a whole had taken place since the gravel epoch, then the present lowest foothills of the range must necessarily during that epoch have been submerged beneath the waters of an inland lake or sea, and in that case there would certainly have been formed upon them extensive lacustrine or marine deposits, some portion of which would have remained until the present time. But the fact is, that no trace of any such deposits can be found from the moment we strike the bedrock foothills.

Third, the mode of distribution of the gravels and volcanic detritus along the edge of the great valley itself, is an almost absolute proof, not only of the assertion that there has been no considerable disturbance of this region since the gravel epoch, but also of the additional fact that the larger streams of that ancient epoch found their exit from the mountains into the valley at almost precisely the same localities as do the larger streams of to-day. For these materials occur in large quantities along the edge of the valley, almost exclusively in the immediate vicinity of the *debouchements* of the larger modern streams, such as the American, the Cosumnes, the Mokelumne, the Calaveras, and the Stanislaus. Moreover, the distribution and present structure of the materials at these localities is not of the kind that would have existed if they had been deposited beneath the waters of a lake or a sea, but is precisely what the action of flowing streams in open air is calculated to produce.

I will close this paper, already longer than I intended to make it, with the single additional remark, that if any one desires further and more convincing proofs of the propositions which I have advanced, I must refer him, first, to such portions of my report upon the gravel regions as are embodied in Prof. Whitney's writings; and, second, to the country itself, which will undoubtedly remain subject to examination for some time to come; being well satisfied that the results of future careful investigations, whatever additional light they may throw on many of the difficult questions connected with this subject, will only serve to confirm the conclusions herein advanced, so far as those conclusions go.

Useful Information.

Hints Concerning Saws.—A saw just large enough to cut through a board will require less power than a saw larger, the number of teeth, speed, and thickness being equal in each. The more teeth, the more power, provided the thickness, speed, and feed are equal. There is, however, a limit, or a point where a few teeth will not answer the place of a large number. The thinner the saw, the more teeth will be required to carry an equal amount of feed to each revolution of the saw, but always at the expense of power. When bench-saws are used, and the sawing is done by a gauge, the lumber is often inclined to clatter and to raise up the back of the saw, when pushed hard. The reason is that the back half of the saw, having an upward motion, has a tendency to lift and raise the piece being sawn, especially when it springs and pinches on the saw, or crowds between the saw and the gauge; while the cut at the front of the saw has the opposite tendency of holding that part of the piece down. The hook or pitch of a saw-tooth should be on a line from one-quarter to one-fifth the diameter of the saw: a one-quarter pitch is mostly used for hard, and a one-fifth for softer timber. For very fine-toothed saws designed for heavy work, such as sawing shingles, etc., even from soft wood, one-quarter pitch is best.

Grindstone Spindles.—Common grindstone spindles, with a crank at one end, are open to the objection that the stone will never keep round, because every person is inclined, more or less, to follow the motion of his foot with his hand, which causes the pressure on the stone to be unequal. The harder pressure is always applied to the very same part of the stone, and will soon make it uneven, so that it is impossible to grind a tool true. To avoid this, put in place of the crank a small cog-wheel to the spindle, say with twelve cogs; have another short spindle, with a crank and a cog-wheel of thirteen cogs, to work into the former. The stone will make about 0.07 of a revolution more than the crank, and the harder pressure of the tool on the stone will change to another place at every turn; and the stone will keep perfectly round if it is a good one.

Removing Obstinate Glass Stoppers.—The obstinate sticking of glass stoppers in bottles is a constant source of trouble, not to say of profanity, in the laboratory, and many methods of loosening them have been suggested. These are all useful, though each of them fails in certain cases, and another has to be tried. The following, given in the *English Mechanic*, will be likely to answer the purpose when the shape of the stopper and of the neck of the bottle admits of its use: "Take two pieces of wood, put them between the neck of the bottle and the lower part of the stopper. Having fixed them securely by a piece of string, soak the whole affair in water, say ten hours; if the wood has not swelled enough, then pour some hot water over the wood, and as it swells (which it must) out comes the stopper."

Staining Pine.—The *Northeastern Lumberman* recommends the following manner of staining pine to present black walnut: Put pulverized asphaltum into a bowl with about twice its bulk of turpentine and set where it is warm, shaking from time to time until dissolved; then strain and apply with either a cloth or a stiff brush. Try a little first, and if the stain be too dark, thin it with turpentine. If desirable to bring out the grain still more, give a coat of boiled oil and turpentine. When the wood is thoroughly dry, polish with a mixture of two parts shellac varnish and one part boiled oil. Apply by putting a few drops at a time on a cloth and rubbing briskly over the wood.

To Prepare Pure Nitrogen.—Mr. W. Gatehouse, in the London *Chemical News*, states that when ammonium nitrate is heated with manganese dioxide (black oxide of manganese) the mixture rapidly assumes a red heat. But if the temperature is kept down as much as possible, to about 180° C. (=356° F.), pure nitrogen is given off, according to the equation: $4NH_4NO_3 + MnO_2 = Mn2NO_3 + 8H_2O + N_6$. Three grams each of ammonium nitrate and manganese dioxide yield 630 cc. of nitrogen in practice, which is nearly the theoretical quantity.

Test for Mercurial Vapors.—As a reagent much more sensitive than gold-foil, M. Merget, of Bordeaux, recommends paper steeped in an ammoniacal solution of nitrate of silver, or in chloride of palladium. This test paper is so sensitive that although a slip of sheet copper, plunged into a liquid containing one part of mercury in ten thousand, remains bright after immersion, when exposed to the ammoniacal silver paper it occasions a characteristic black spot. Mercury, even when solidified by cold, emits vapors in quantity appreciable by the reagent.

Good Health.

Blistering as a Remedy.

Dr. H. S. Anderson, in his recent "Harveian Discourse," published in the *Edinburg Medical Journal*, speaks as follows of the uses of blistering:

Another remedy, which I fear is somewhat unduly neglected also, is counter-irritation by means of blistering; and I think I have observed in some young practitioners an approach to something like terror when blistering is spoken of as a remedy that may frequently be used. Certainly, as regards children's diseases, there is more of this fear than there should be. It has frequently, for example, been my experience to see children, in consultation with a younger practitioner, when blistering in acute head affections had never been dreamed of. In nearly all acute inflammatory affections of the brain, tubercular or not, in children, I am strongly of opinion that after shaving the head the application of blistering fluid has a most rapid and satisfactory effect. Inflammatory attacks also of the peritonæum and chest in children are often controlled by blistering, although the size of the vesicatory and the length of time applied must be carefully considered. And in the rheumatic affections of the joints in adults repeated blistering has often the happiest results. For many chronic conditions, also, counter-irritation has always held a high place in my list of remedies. In chronic tubercular affections of both chest and abdomen I think occasional and repeated blistering is frequently beneficial, and also in chronic and obscure head and other affections of the nervous system. For example, a blister over the roots of the nerves in herpes zoster often relieves the neuralgic pain so generally present, and often so difficult to get rid of. In diphtheritic paralysis, also, blistering the nape of the neck, and even down the spine, often expedites cure in a wonderful way. In the uterine or ovarian pain so often complained of in the left side there is no better remedy, sometimes, than a succession of fly-blisters, and the tenderness of spinal irritation is frequently relieved, if not got rid of by the same means. In chronic effusions the use of blisters is still fully acknowledged, and do not, therefore, call for special mention.

Antagonistic Agents.—*Morphia*—The antagonistic action of morphia and atropia upon respiration is brought out in strong contrast, and attention is called to the similarity of their action upon the reflex mechanism. In the coma of opium sleep or poison there is a low blood pressure, while the delirium of belladonna poison is due to the high blood pressure, induced by this agent. It is suggested that belladonna will enable the centers to continue in action under large doses of morphia without marked interference with the action of the latter upon the cerebral spinal centers. *Strychnia*—This agent exerts a powerful influence over poisonous doses of chloral, and chloral exerts even a greater power in counteracting the toxic effects of strychnia. From this fact it is argued that strychnia stimulates respiration, and the author recommends its use in chronic bronchitis, emphysema, etc., especially as it is also known to act as a cardiac stimulant. Dr. Fothergill considers strychnia superior to digatalis as an antidote to aconite.

Poisonous Clothing.—The aniline dyes now extensively used ought to be employed with caution, since it appears they may render wearing apparel poisonous. There have been a large number of cases reported from various sections of the country of children having their legs poisoned from wearing colored stockings. A sad case is reported from Hartford, the victim being a young lady of that city, who has had her face seriously poisoned from a new blue veil, which, when examined by a chemist, was found to contain a large quantity of aniline dye. This dye is obtained from coal tar, which is a residuum obtained in the manufacture of gas from coal.

A New Anæsthetic.—The Paris correspondent of the *Lancet* gives some particulars of Prof. Bert's new method of producing anæsthesia. A mixture of 85 parts of nitrous oxide and 15 parts of oxygen was inhaled by a patient under increased atmospheric pressure. The experimenters were subject to the same pressure, but it was not sufficient to cause serious discomfort. In about 15 seconds the patient was completely insensible and the muscles relaxed. Dr. Labbe then operated for ingrowing toe nail, and the patient recovered consciousness in less than a minute after the anæsthetic was withdrawn. Under ordinary pressure the mixture does not produce any anæsthetic effect.

The Death-run.—An eminent English surgeon states, on no account, except that serious fire was on hand, or to save a life, should any person ever *run* after having reached 50 years of ago. The reason alleged was, that a tendency to heart disease, apoplexy, etc., might suddenly be brought to a climax by violent exertion, and especially with corpulent persons. Mr. William Adamson, aged 56 years, residing at Germantown, Pa., lately ran a considerable distance to reach a train of cars and fell dead. A post-mortem examination showed that he died of heart disease.

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The Week.

This week has been characterized by favorable indications from a mining and manufacturing point of view, as well as by the infallible signs of a revival in the business community. The prospector is meeting with his merited reward in the speedy development of mining interests in the whole Rocky Mountain region. Aside from an occasional exaggerated account of some "find" in Arizona and Utah, the mining operations of this region have developed into a steady money-making business, displayed visibly by the streams of bullion flowing from every quarter. Some old claims are being bought up by capitalists, who are making preparations to derive a good income from the investments. Speculative prospects are very little regarded, and it seems as if the day of "paper" mining has gone forever. Judging from a variety of information, the clouds are gradually breaking and the sun of prosperity is shining upon us, to warm us into unwonted vigor. The Holloway process in another column seems to be worthy of investigation in the economical treatment of sulphurets, etc. The foreign scientific and mining journals have deemed it worthy of an extensive notice. The origin of auriferous gravel deposits and mineral veins is being closely investigated—with what results may be better determined at some future day. Old theories seem to be revived or carefully compared with the results of recent discoveries. There is more unanimity in the scientific researches now being made, and the various geological questions which have arisen from the anomalies of the Rocky Mountain region are nearly ripe for solution. In nothing does this coast shine more than in the wisdom of our mining laws, if the Eastern mining press is any criterion. The East is called upon to copy a system as a nearly perfect one, which but a short time ago was decried as full of imperfections, and the uncertainty of Eastern mining requirements has driven capital in our direction. With regard to inventors, the courts are basing their rulings upon broader grounds than the mere dicta of the books. Altogether, the week indicates the inauguration of an era of common sense progress.

A New Metallurgical Process.

We took occasion in another number to mention the Holway process of utilizing sulphides as fuel. The process is exciting the attention of metallurgists in Europe, but so far as we have been informed very little attention has been given to the matter in the United States, particularly on this coast. The ores suitable for use in this process are so abundantly distributed over all parts of this coast, and the process itself seems to be so well based upon large, practical experiments, that it may be of great importance as regards the economical extraction of gold and silver. From the experiments it appears that copper, gold, silver and nickel are all extracted with equal ease, and when we consider that a very small mine output is regarded as a paying investment in Great Britain, the value of the process is enhanced by the statement in the *Mining World* that it may increase the value of many mines now almost valueless. The consumption of fuel in all of our metallurgical operations is vastly in excess of the theoretical limit, and much inquiry has been devoted to its economization. The causes which militate against perfect economy lie, perhaps, in the misunderstood or misapplied elements of nature. We know by practical every day experience that an excess of fuel in a furnace smothers combustion, and that only a well regulated supply, sufficient to maintain an equable degree of temperature, is proper. Yet we introduce into our furnaces an excess of oxygen only a portion of which acts upon the material to be burned, or the oxygen is not brought in contact with the combustible matter with sufficient rapidity to obtain the required temperature for the operation, and the oxidation of the substance is incomplete. Again, the various gases generated are suffered to pass off hot or unconsumed. In the Bessemer process a high point of utility has been reached. By blowing air through molten crude iron a very high temperature is attained by the combustion of small quantities of carbon and silicon contained in the crude iron. But the Bessemer process is still open to the objection that the carbon is only partially consumed, and a large amount of heat escapes with the carbonic oxide and nitrogen.

The theory of the new process is as follows: When thin streams of air are forced through molten sulphide of iron, lying on a tuyere hearth, a high temperature is produced by the perfect combustion which ensues in the midst of the sulphides, and no unburnt gases, excepting nitrogen and sulphur vapor, escape from the surface of the molten mass. The hot nitrogen and sulphurous acid may be forced to act upon iron pyrites and other mineral matter obtaining molten protosulphide, which is subsequently burnt by the oxygen of the air driven in at the lower part of the furnace, thereby producing the heat necessary for continuing the operation. It is, in fact, a system of fractional oxidation, in which the numerous constituents of a complex furnace charge can be separated from each other, and concentrated in different parts of the apparatus, the heat necessary for the operation being obtained by the combustion of a portion of the less valuable constituents.

Gold and silver do not oxidize under the same conditions as other metals, for which reason in supplying air to the ores of these metals, the iron is the first element to suffer oxidation, so that if the oxidation be arrested before the whole of the iron has been burnt, the cobalt, nickel, copper, silver and gold present will be found in the unburned portion. The same principle exists in the Bessemer process of treating pig-iron for the manufacture of steel, in which a current of air is caused to bubble up through a bath of molten crude iron. The silicon is first oxidized, and is followed by the carbon until the whole of the silicon and carbon have been burned out of the molten material. Even in the more volatile metals the process has been employed. A. H. Allen of Sheffield, by it, has obtained metallic antimony simply by the oxidation of sulphide of antimony. This is the substance of Mr. Holway's process which has been the theme of much comment in European scientific journals. One of its chief merits is the claim that it is equally applicable to the very poor as to the very rich ores, for however small the resulting regulus, it will contain nearly the whole of the silver and gold present in the furnace charge, while any lead, zinc, antimony and arsenic will be obtained as sublimates.

It is also claimed, as is evident from the description, that it will almost entirely obviate the necessity for using carbonaceous fuel, at least so far as the production of a regulus is concerned. *Nature* says, "one of the chief practical questions connected with this process is how far it may be trusted to effect the smelting of ores containing moderate proportions of sulphides." We believe the supply might be increased by adding pyrites, as there is no danger from an excess.

The whole process seems to be the obtaining of gold and silver, as well as other metals through concentration and separation in the form of metallic regulus, by a process analagous to destructive distillation.

A DEFICIENCY of over $20,000 has been discovered in the funds of the county treasury of Santa Cruz, and the Treasurer has been placed under arrest.

Patentees and the Government.

Many cases have arisen under the Patent laws in which a patentee has sought to recover damages from the Government for the infringement of his patent right, and it has always seemed a hardship for inventors to suffer a sacrifice of the exclusive privileges granted in their letters patent through the violation thereof by the power which created and granted the right. Decisions of the United States Courts have heretofore seemed to concede the abstract right of the inventor to damages against the Government for infringement, but considered it in the light of a *damnum absque injuria*, inasmuch as a remedial action could not be enforced against the United States. A case, however, has lately been decided by Judge Wheeler in the United States Circuit Court for the Southern District of New York which, while recognizing the doctrine of impeccability of the Government, indicates a way by which patentees may enforce their rights against violations under Governmental authority.

The suit was brought by the owner of a patent granted in 1863 to Marcus P. Norton for an improvement in marking and cancelling stamps for postoffice use. The device diminished the time for stamping letters by about one-half, the machine cancelling the stamp and imprinting the post-mark at a single stroke. There is no demand for such an invention, however, except for postal purposes, hence when the owner of the patent found that the postoffices persisted in using the machine without paying royalty, he discovered that his invention was in danger of becoming valueless.

This suit was brought directly against Postmaster James for infringement, and required him to account for profits realized from his use of the invention in the New York postoffice. The defense of chief general interest was that the postmaster, in using the stamp, acted as an officer for the Government, and only for its benefit; and that the monopoly granted by a patent does not extend to or prohibit use by the Government. As to this point the opinion says:

"But the exclusive use of the invention granted to the patentee is property, and this property is now owned by the plaintiff. The grant saved nothing for the use of the Government; it was exclusive absolutely throughout the United States. It was granted by express law of Congress, pursuant to the Constitution, without which it could not exist. But all property is upheld by law, either expressly or impliedly enacted or adopted, all of which is the law of the land, the same as the statutes upholding patents are. This property, like all other private property recognized by law, is exempt from being taken for public use without just compensation by the supreme law of the land. Nor can it be taken by any officer at will, in time of peace, leaving the owner to seek compensation. The property in a patented invention stands the same as other property in this respect."

The courts have agreed that though English patents are probably subject to a right of the Crown to use the invention, yet under our patent law no such reservation is implied; the United States has no better right than has a private person. But familiar principles forbid the courts to enjoin the Government directly, the chief obstacle being that although the court can render judgment against the Government for money it has contracted to pay, it cannot for damages for wrongs done by its officers.

Under Judge Wheeler's decision, a patentee may claim profits from the officer chargeable with infringing. The doctrine has support from a decision of the Circuit Court in Massachusetts, about two years ago, where infringers made defense that their use of the invention was not for their own benefit, but to fill a contract with Government, and for its use; but the court said this was no protection—Government could not authorize them to violate patents. And it is consonant with justice. In the whole function of forwarding letters, Government acts only as a business agent of the masses of the people; and if they, as individuals, have not the right to use an invention free, their agent the Postoffice Department, should not be allowed to do so. The same principle obtains in other branches of the business of the Government.

EUROPEAN INVENTIONS IN JAPAN.—A singular outcome of the policy of the British government in opposing international patent and copyright laws, so often urged upon it, has recently been developed in Japan. It appears that a well known firm in Nagasaki recently imported a Jordan's patent rock-drill for use at Inakasima, where blasting is constantly going on, but no sooner did the officials at the Government works at Akenoura hear of its arrival and its excellent results than an exact copy was made, which may now be seen in the Nagasaki exhibition. The Japanese specimen is excellently made, and reflects credit on those who undertook the work, but the higher question of infringement of foreign patents is one which may fairly occupy the attention of Ministers. The last sentence means "bombarding" the ports of Japan to obtain damages for the infringement of a patent. It is urged upon Japan by the English journals that "if she wishes to hold her place among the advanced nations of the world, a guarantee will have to be given that foreign inventors shall meet with that honesty to which their genius and labor entitle them."

Chrome Mines of San Luis Obispo.

The chrome mines of San Luis Obispo county seem to be attracting considerable attention, and from information gathered through the *Tribune* we infer that the ore deposits are extensive enough to justify the erection of reduction works. The principal mine, the "London," was accidentally discovered by two parties while on a hunting excursion in the fall of 1877. It is located about five miles north of San Luis Obispo, and is now being worked. The peculiarity of this location is that the chrome is not a surface deposit as is usually the case, but exists in an extensive stratum or vein. Work was commenced by running a tunnel into the hill on the west side 75 or a 100 feet, when the ore was struck and some 400 tons taken out; when, owing to the negligence of the miners a cave occurred, which for the time being put a stop to operations. The owners of the mine then concluded to tap the hill on the south side. Accordingly a contract was made with a party, who ran a tunnel in about 100 feet; but failing to strike the ore, the contractor became discouraged and abandoned the work when, as was subsequently demonstrated, he was within eight feet of the deposit. A third contract was entered into with Mr. Benitze, an experienced miner, under whose supervision the work is now progressing satisfactorily. There are two tunnels in the hill, one about 40 feet above the other, and they are in about 125 feet. These tunnels are connected at the extreme end by a winding, irregular shaft or chamber, from which the ore is taken. For a distance of about 50 feet from the entrance of the tunnels the rock is firm and no timbering is required. Beyond that point, however, the rock is soft and crumbling, and necessitates timbering. The timber used is procured near at hand. In the lower tunnel a track is laid, and a small car is used to carry the ore to the "dump." The shaft connecting the tunnels is through an immense body of ore, which appears to be of the finest grade. The superintendent of the works says there is more chrome in the mine than can be taken out in 10 years. They are now extracting about 20 tons per day with the labor of six men. It is claimed that about 4,000 tons, of 2,240 pounds have been taken out of the London mine. The average price received has been about $7 per ton.

Although the latter mine has as good prospects as any other mine it is not the only one producing largely. There are said to be at least a dozen in the district which are now yielding large quantities of ore. The Trinidad particularly has been worked constantly for nearly two years, and the estimated yield several thousand tons. Other mines are yielding very rich ore, the average assay of some being as high as 50%. The total output cannot be stated with certainty, because some of the mine-owners are not inclined to make known their product. Besides the organized mines considerable chrome has been taken out of small deposits by individuals in various localities. A fair estimate, however, would place the total output for the last two years in the neighborhood of nearly 22,000 tons. The average price for the ore is $7 per ton. Many claims, however, are not now being worked, because the prices offered for the ore will not pay the expense of mining. With the contemplated reduction works in operation it is claimed the ore would bring from $18 to $25 per ton.

The Sierra Mojada Mine.

The mineral wealth of Mexico is to a great extent still unknown. The advantages for prospecting are not as favorable as in the more settled regions of the United States. Immensely rich ancient mines, which are known to exist from their mention in old records, are eagerly sought for. The Indians know more than they are willing to tell, knowing perhaps the fate of their ancestors when the gold hunters arrived. Rich mines have recently been found in the Sierra Mojada by a Mexican Lieutenant and squad while in search of Indians. The San Antonio *Express* thus mentions the *find:*

Believing that the Indians made their abode in the rough and almost unapproachable region, the Lieutenant proceeded to investigate, and came upon several squaws and children, and two worn-out warriors, molding bullets. The reds were taken in tow, when the cave was searched, and quite a quantity of silver bullets and other roughly made silver articles were found. So astonished was the Lieutenant to find the precious metal put to such a common use that he made further search, discovering the very locality at which they obtained the ore. Their mining tools consisted principally of two or three old hatchets and axes, with which they cut the ore loose as it clung, an almost solid mass, to the side of a gigantic mountain. For years the Indians have visited many Mexican towns, even going as far as Monclova, with cargoes of bullets of pure silver, which they almost gave away. But no one knew anterior to the discovery made by the Mexican Lieutenant above referred to, where they manufactured the bullets. Now, the locality is swarming with seekers after wealth, and the richest silver discoveries known have been found.

New Electric Mining Lamps.

A late number of the *Colliery Guardian* gives a long account of Andre's electric mining lamp, claiming its great desirability in mining operations, sub-aqueous works, and in factories where explosive agents are dealt with.

The light is enclosed in a strong glass cylinder, open only at its lower end, which rests in an air-tight seating upon the base of the lamp. By this means the atmosphere is securely excluded, and explosions of fire-damp certainly prevented. The cylinder is protected by rods on the outside; the lamp is constructed to be suspended from these rods, and the latter are utilized to pass the electric current in to the carbons. Being thus complete in itself, the lamp, when not in action, may be easily carried about from place to place, and suspended at any point required. The lamp consists essentially of four small carbon rods or pencils, enclosed in a series of vertical tubes. A light weight in each of these tubes above the carbon rod forces the latter down as its lower end is consumed. This weight is not heavy enough to break the point of the carbon, even when the point has become very fine, so that no unpleasant flickering occurs as the carbon descends, and no waste is occasioned. The arrangement of the carbon rods and the weights in tubes obviates the necessity for the strings required in other electric lamps working on the same principle of incandescence. The lower ends of the carbons rests upon discs of copper, which constitute the negative poles. The metal being incombustible, only one pole, the positive, is burned away. When the current is impeded by the accumulation of silicious dust from impurities in the carbon the disc turns slightly, and the point of the carbon sweeps the impediment away; and should the carbon rod fail to descend, by sticking in the tube, the disc rises and breaks it away from its point of contact.

The glass cylinder being air-tight, the combustion of the carbon is retarded through lack of oxygen, and finally ceases altogether. Practically, however, a slow waste occurs, due, perhaps, to oxygen occluded in the carbon, or possibly by the disintegrating action of the electric current. When the first carbon rod has been consumed, or if from any other cause it becomes extinguished from an interruption of the circuit, the current passes automatically to the second of the series. This rod is then slowly consumed, like the latter portion of the first. From the second, the current passes in like manner automatically to the third of the series, and from this again to the fourth. The total duration of the four carbons, which are each 9 inches in length, varies from 500 to 600 hours, according to the strength of current used.

There is no risk of the lamp being extinguished, because, in case of an interruption, the automatic action of the commutator switches the current from one carbon to the next in the series. The intensity of the light is about 75 candles. The light is regarded of great importance, in consequence of its superiority and the non-vitiating and non-heating of the atmosphere of the mine. It also works well under water, in works where caissons are used.

Our Resident Arizona Agent.

Capt. W. H. Seamans, our agent in Arizona, has his residence at Tucson. He will, however, make occasional trips into other parts of the Territory. Capt. S. will correspond for the PRESS, and solicits items of mining news and discoveries. We hope our readers in that part of the country will assist him as far as they can in furnishing information and increasing the circulation of the PRESS. We have faith that Arizona will in time develop even more wonderful mineral wealth than it has yet done, and that its mining interests will in the near future rival those of older settled communities. We desire to assist these developments by spreading a knowledge of the resources of the Territory, among that hardy class of prospectors and miners who make such a country. We wish also to call the attention of our men of capital to the wealth which now lies hidden within its borders, needing only their slight assistance to be rendered available. We have therefore requested Capt. Seamans to act as Territorial agent for the PRESS, and to furnish us with all the information possible concerning the mineral resources of the country.

A PIONEER'S WORK.—We have received from the author, Rev. Albert Williams, an interesting work having for title "A Pioneer Pastorate and Times," embodying contemporary local transactions and events. Mr. Williams arrived in California in 1849, and became the founder and pastor of the First Presbyterian Church of S. F., the pioneer Protestant Church organization. The book is a pleasant narrative of matters that fell under the personal observation of the author, and is a book which when commenced grows in interest as each historical fact of California incidents approaches the California of to-day. We are charmed with the work.

Composition of the Iowa Meteorite.

On the 10th of last May a meteorite fell at Estherville, Emmet Co., Iowa, about 5 P. M. Its fall was attended by a terrible explosion, resembling the discharge of a cannon, only louder. Numerous succeeding explosions were heard, and to an eye-witness the track of the meteor appeared like a red streak in the heavens, passing from west to east. The mass penetrated 14 feet below the surface, and weighed 431 pounds. It measured 27 inches in length by 22¾ in breadth and 15 in thickness. Its surface is described as "fearfully rough," with ragged projections of metal. Several smaller masses, varying in weight from one to eight ounces, were found in the immediate vicinity.

Prof. Shepard, of Amherst college, in a description of this meteorite, says that it is marked by the unusual prevalence of chrysolite and meteoric iron, the former constituting two-thirds its bulk; also by the size and distinctness of the chrysolitic individuals, which are of a uniform yellowish gray or greenish-black color. It is highly crystalline and difficultly frangible. There are no traces of decomposition; on the contrary, it is throughout a fresh, undecomposed crystalline aggregate. The stony portions nowhere present traces of oolitic or semi-porphyritic structure, so common in meteoric stones.

A very remarkable appearance is exhibited by the meteoric iron in some of the specimens. It is the bright, silvery whiteness of the metal where it forms a portion of the exterior of the stone. It appears to have been fused, and is surrounded on all sides by the black crust, coming from the stony material. It will be interesting to know whether this character prevails over the main mass from which these fragments were separated. If such should be the fact, it would give us a second case in which meteoric iron, seen to fall, reached the earth in the possession exteriorily of a high metallic luster. The other instance is that of the Dickson County meteorite, Tennessee, July 30th, 1835.

The next most conspicuous species present is troilite. This also is in distinct individuals, sometimes as large as a pea. It is highly crystalline, rarely presenting splendent crystalline facets, whose color approaches silver-white. The proportion in which it exists is apparently large, and may equal 2%.

Next in importance comes the feldspathic mineral, presumably anorthite. It is highly crystalline, white, lustrous and nearly transparent, resembling in these particulars the similar mineral found among the ejecta of Vesuvius.

Among the specimens are two very distinct examples of an opal-like mineral of a yellowish-brown color, which I take to be chassignite. Its luster is resinous, structure imperfectly slaty, to massive and conchoidal. A small granule of chromite occurs in one of the fragments of the massive chrysolite.

Judging from specimens in hand, Prof. Shepard thinks it cannot properly be referred to any group of meteoric stones with which we are acquainted. It would rather appear to be a connecting link between the lithofites and the lithosiderites, though it may possibly find a place in the eucritic group of the former, in which case it would form an order by itself.

AURIFEROUS GRAVELS.—The paper on "The Auriferous Gravels of California," read at the last meeting of the California Academy of Sciences, and which we give in full on pages 182–183 of this issue, will be read with interest by our hydraulic miners. It is by W. A. Goodyear, formerly of the California State Geological Survey, and now Geologist of the Republic of Salvador. During his connection with the Geological Survey of this State, Mr. Goodyear studied closely the questions connected with our gravel regions, and publishes some conclusions in the paper referred to. And, by the way, in reading it, the word "something," in the sixth line of the third column, should be "sometimes," reading, "even *sometimes* directly northeast," etc.

A NUMBER of farmers have sailed from Liverpool for Canada, to investigate the advantages of settlement in the Dominion.

DAILY, the California champion, was defeated by Capt. Webb in their swimming match at Coney Island last Sunday.

A REMARKABLE increase of Chinese has taken place in New York, Boston and Philadelphia during the past two years.

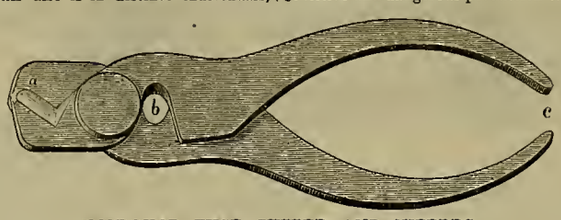
Combined Fuse Cutter and Nippers.

In firing charges of any of the high grade explosives, such as Giant, Vulcan or Safety powders, a very powerful cap is required. These caps contain a substance or substances which require pressure and confinement in order to be rendered effective. The ends of the caps are left open for the introduction of the end of the fuse or electric igniter, and the copper of the cap is then pressed or squeezed over the fuse so as to close the end tightly, and at the same time secure the fuse to it. The fuse itself is cut fresh when introduced in the cap. Ordinarily the cap is pressed over the fuse by biting the cap between the teeth, an extremely dangerous undertaking, but one commonly done by miners accustomed to use the cap.

The Safety Powder Company of this city have a combination implement, by means of which the fuse may be cut off, and the cap squeezed or pressed around it, the same implement answering both purposes.

It is formed somewhat in the shape of an ordinary pair of pliers, as the engraving shows. The head of the tool is formed with a pair of angular cutting blades, *a*, by means of which the fuse is cut off square. In beveling off the heads to form the cutting blade, the bevels are made so as to form a central notch on each side as shown, the upper part of each blade inclining outward from the top. This construction causes the two blades to form a sort of hook or grip, which prevents the pressure on the handle forcing the fuse out between the blades. In the shank of the implement are formed the jaws, *b*, in which is formed an edge which will not cut the copper or brass of the cartridge, but will squeeze it tightly around the fuse. After the fuse is cut and put into the open end of the cartridge the latter is inserted between the jaws, and by bringing the handles together the cartridge is tightly squeezed around the fuse.

The implement is stamped out of flat steel, light and strong, and may be carried in the pocket conveniently. The implement is particularly intended for use with the "Safety Caps," a new an important substitute for the sensitive and dangerous percussion caps in common use. The nature of the cap filling requires close confinement, and the copper of the cap has to be pressed firmly over the fuse, which this combined implement does perfectly. It was recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency by Gen. W. S. Rosecrans, President of the Safety Powder Company of this city.



IMPROVED FUSE CUTTER AND NIPPERS.

Colorado State Geologist.

We were glad to receive a visit yesterday from J. Alden Smith, State Geologist of Colorado, who is in California on business and for information.

Mr. S. is of opinion that the mining industry of Colorado is rapidly assuming the condition of a steady paying business, free from great excitement. The discoveries that have been made are very satisfactory as convincing proofs of the wealth of the State. The carbonates are very rich, although many quite rich claims are not being worked because lead is worth nothing. It is claimed that in the Leadville region bullion to the value of $800,000 per month is being turned out.

Speaking of the carbonates, Mr. S. says they exist in many places from 30 to 40 feet in thickness, yielding from 60 to 500 ounces of silver per ton. The carbonates are very soft and melt up like butter, the highest grade yielding 40% lead and about 50 ounces silver. The metals are run into base bullion, which is shipped elsewhere.

Several mines of telluride ores are being worked in Boulder county, two of which, the "American" and "Slide," are down about 500 feet, and producing largely. The value of third grade ore averages $250 per ton. The veins are well defined, some of them being contact veins between porphyry and granite. Most of the fissure veins are in granite. Some rich veins are found in mica slate. The average thickness of the ore is 2½ feet. Mr. Smith goes from San Francisco to Grass Valley.

THE President of the Howard Association of Memphis is in New York, seeking aid for the yellow fever sufferers.

SIXTY THOUSAND workmen are affected by the trouble between the earthenware manufacturers and their men in England.

Peculiarities of Altitude.

A correspondent writing recently from Leadville to the Grass Valley *Union*, speaking of the effects of the great altitude of the place, which is 10,300 feet above the level of the sea, says that all fermented liquors intoxicate more quickly than at lower elevations. The boiling point, owing to the decrease of atmospheric pressure, is much lower than at San Francisco, and the alcohol is sooner vaporized and taken into the circulation, producing intoxication much quicker.

The boiling point of water here is about 190 degrees, instead of 212 degrees, the effect of which in boiling beans, eggs, potatoes, etc., is that it requires a long while to cook them in an open vessel, and it is necessary to keep the pot well covered or the water will vaporize and escape before being raised to the requisite degree for thorough cooking. At this elevation much air is required to fill and satisfy the lungs, and breathing must be quicker in order to properly oxygenize the blood. It is said, too, that after one has been here for some time the coloring matter of the blood becomes darker, being changed from the peroxide to the sesquioxide of iron. With a person suffering under any difficulty or disease of the heart the effect of any long-continued exertion is to cause a dangerous degree of palpitation, and even with persons entirely well the pulse runs extremely high.

There are other and notable facts connected with this altitude. There are few birds seen here—perhaps for the reason that flying is difficult in the light air. The common house-fly, the summer pest of our Eastern housekeepers, is unknown here. There are some of the outdoor blue-bottle variety, but they seem languid and tired.

Another result of the lightness of the air is that, having so little density, it is easily heated by artificial means. Our nights are uniformly cold—so cold that it is uncomfortable to sit without a fire; but a few pine chips or small sticks will warm an apartment very quickly. At the same time the sun's rays do not seem to have the heating power that they do in lower elevations. This seems to confirm the theory that there is no substantial caloric in the rays of the sun, but that heat is the result of chemical action, generated by the direct rays with the elements of the atmosphere—the directness of the rays and the density of the atmosphere. While standing high upon these mountains, even at a distance from any snow-drifts, and where the air is still, the summer sun has only sufficient power to make the air refreshing and pleasant, while those on the plains are sweltering under a torrid heat. In the shade of a rock or two it is always cool enough.

The effect of the altitude is the same as that experienced by balloonists, who in ascending from the surface of the earth, even on the hottest day, soon find it necessary to don their overcoats and warmest clothing. In the night, here, a good supply of blankets is always necessary, and nearly every morning heavy frosts are found, and sometimes thick scales of ice are formed. The crests of some of the mountains and many of the deep ravines upon their sides are still full of masses of snow so compact that one can walk over them without sinking. A day or two ago, in visiting a mine close to the summit of Mount Bross, I was compelled to cross a field of snow, hanging over the edge, which must have been a mile in length and probably in places twenty-five feet in depth.

A PROPER INQUIRY.—We call attention to the letter of John A. Church, M. E., of 115 Broadway, N. Y. We can assure our readers that the information is desired for scientific purposes only. The object in seeking the information is to settle the true status of milling as applied to gold ores. There is vast wealth yet undeveloped in our exhaustless mineral deposits, which needs only the requisite economical process to bring out. But there cannot be a satisfactory termination of the present difficulties in that direction without the combined assistance of a large number in furnishing information. Deductions may be correctly drawn from correct information founded upon the experience of many, whereas perfection of system may be long delayed by withholding the results of that experience. We hope that the desire of Mr. Church will be fully appreciated, and that everyone interested in this all-important matter will carry out his wishes as far as they are able.

COMETS IN SIGHT.—The Rochester *Democrat* says: Three comets are now visible in the northern heavens. Two of them are in the Great Bear, and not far apart. The second comet, discovered by Palisa, is very bright, and can be seen with quite small telescopes. The third comet is faint, but covers quite a large space. This comet was recently observed with a three-inch telescope and comet eye-piece. The comet was so faint that it could not be well defined or kept steadily in view. It was seen by flashes which were quite bright, and seemed to proceed from a center. If the last two comets have not already passed their perihelion, they may yet be seen with the naked eye.

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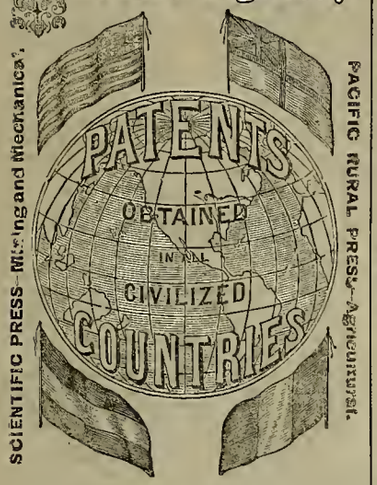

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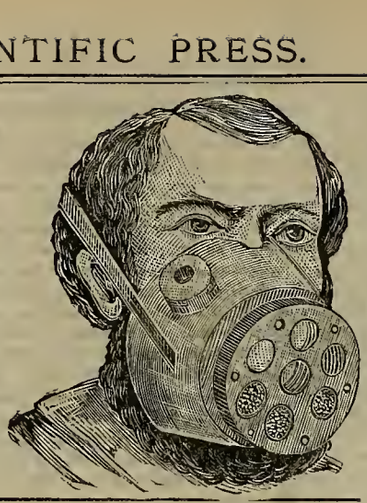

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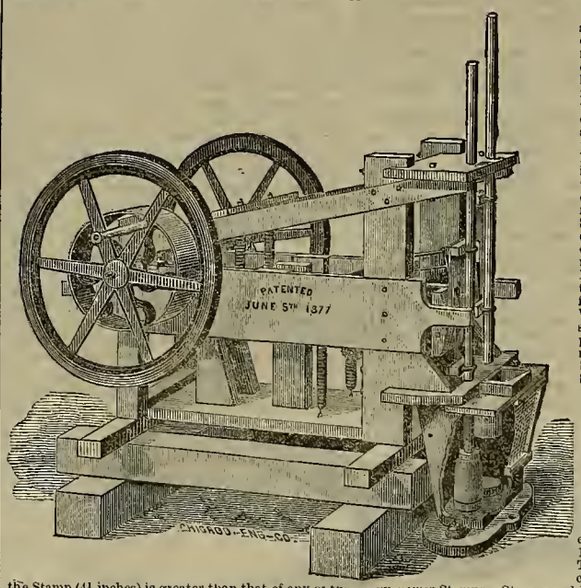

Two men can operate it all day. It is simple, efficient and durable. The force of the blow can be changed so as to strike a light or a very heavy blow readily. Two men can work this Mill to its full capacity, and do the work as well as can be done with any of the old-style heavy Stamp Mills. An inspection of this Machine will convince any practical person that it is the most perfect QUARTZ STAMP MILL ever produced in this or any other country. A large number of old practical Miners have seen it, and they all say it is a perfect Hand Stamp Mill. We put on a band pulley, so it can be run with power. The cut is a correct representation of C. EATON'S Patent LATELY PERFECTED MILL.

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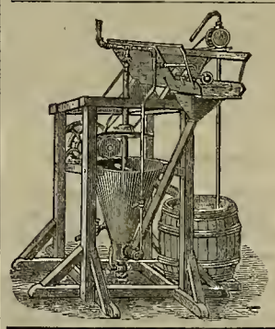

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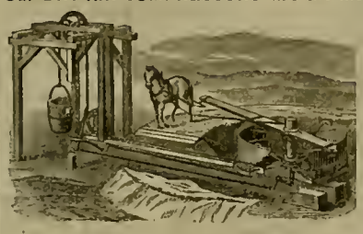

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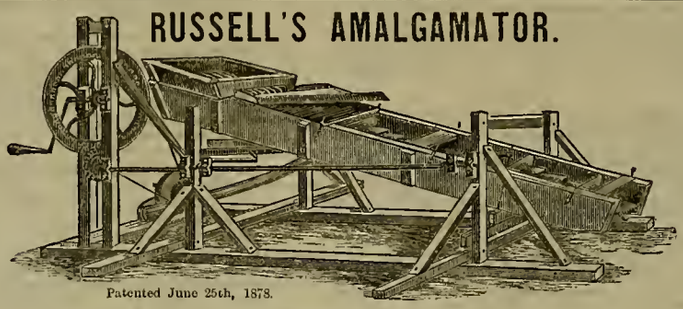

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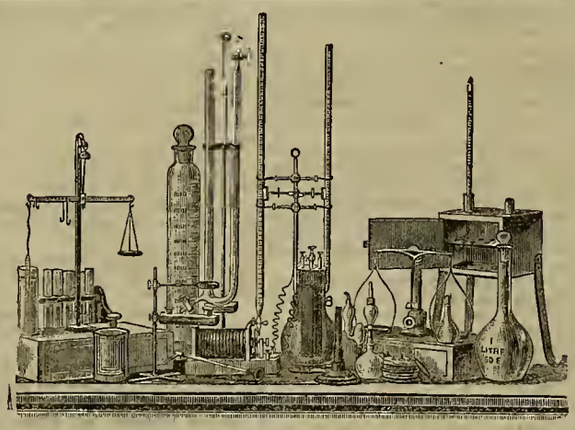

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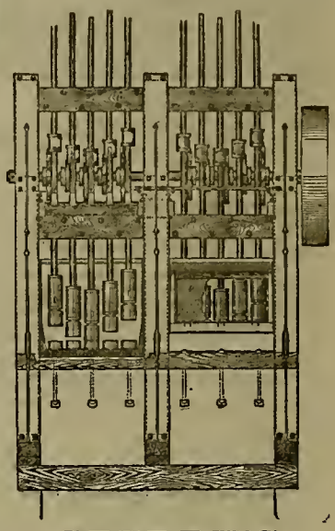

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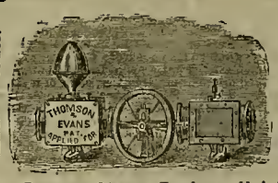

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[CONTINUED FROM PAGE 181.]

low color and assays from $200 to $600.

ITEMS.—The Valley M. & M. Co. have recently made a good strike of rich ore at Hiko. The developments in the Dry mine have greatly improved of late, and the indications are that they are sinking the winze on top of a large deposit of ore.

DISASTER PEAK DISTRICT.

ITEM.—*Silver State*, Sept. 11: Very favorable reports are received from the new mines recently discovered near Disaster peak. A new district has been organized in the locality, and a lead discovered by Tom Shaw, is said to be one of the largest in the State. There is an immense body of ore on the surface, samples of which assay from $115 to $233 per ton. The district is situated about 40 miles a little west of north from Willow Creek station on the Idaho road.

ESMERALDA DISTRICT.

DEL MONTE.—*Herald*, Sept. 13: The erection of the gallows frame has been completed and the additional work on the building is being carried on as rapidly as possible. The station in the drain tunnel has been finished and strongly timbered. Several pieces of the new pumping machinery have arrived and are on the ground ready to be operated on so soon as the remainder arrives.

GOOD HOPE DISTRICT.

NEW STRIKE.—*Silver State*, Sept. 11: Charley Drew informs the *Times-Review* that a body of very rich black sulphuret ore was struck in the Amazon mine, Good Hope district, last week. Shortly after the ore body was struck the men were driven out of the mine by a strong flow of water.

SAN ANTONIO DISTRICT.

ITEM.—Belmont *Courier*, Sept. 13: The Liberty, Potomac, Springfield, Twilight, Rigby, Vulcan, Las Animas, Aerolite, Imperial, Ivy Green and Phœnix have been consolidated into one company. The pay chute of the Liberty mine is in the main fissure, but contains the rich ore from $100 to $500 per ton, in what is essentially a chimney. Outside of this the ore runs from $20 to $100 per ton. This mine is much broken up at the surface, the cropping to the northwest and west of the incline revealing a number of rich feeders that have apparently been thrust up from below and then forced over and spread out toward the foot of the hill. The vein formation further up the mountain supports the theory, the ledge being well defined at the surface, and, as far as known, permanent in the dip. The fault along the line of which the movement occurred has been carefully located, and a crosscut run below the break by Mr. Rigby just before the close of his management revealed the vein, lost some time previously on the upper level, where the break took place, between well defined walls, the vein matter consisting of quartz carrying ore of low grade. Potomac hill is the highest elevation in the district. Its formation is well adapted for tunneling. The main ledge is shown in prominent croppings extending across the summit and traversing the hills in a direction nearly northwest and southeast. To the southwest and along the slope of the hill there are strong indication of an outhurst from below, as rich ore has been found at numerous points on the surface without any regularity of cropping or definiteness of dip. The tunnel that has been run into the hill from the southwest in a northeasterly direction is now in about 450 ft, and will soon strike the lode at a depth of about 300 ft below the summit cropping.

WILLOW CREEK DISTRICT.

ITEMS.—*Silver State*, Sept. 12: Rich ore is now being taken out of the Ohio mine. Much of it assays from $600 to $1,000 per ton, and they intend to ship another carload of it to Salt Lake some time this month. The Moonlight mine is also looking well. The ledge is 14 ft wide and the ore assays from $60 to $125 per ton.

ARIZONA.

TOMBSTONE ITEMS.—From *Citizen:* The Tombstone mill averages one bar a day from Tough Nut ore. Grading for the Corbin mill is completed. The shaft on the Grand Central, eight by five ft in the clear, is down 45 ft in good ore. The Contention mill site is on the San Pedro, one mile from the mouth of the Babacomari and 12 below the other mills. The Tough Nut employs 60 men. The main shaft is down 80 ft, and the new hoisting works are being put in place. The Arizona Transportation Co. (Ham. Light's teams) haul the Tough Nut ore; last Monday one team hauled 20,000 and the other 30,000 pounds—the average is 13 tons per day. It is now held by the parties best qualified to judge, that the Contention and Tough Nut ledges are the same, which enhances the value of intervening claims.

ITEMS.—From *Silver Belt:* Capt. J. A. Powlett has purchased a 10-stamp mill to be erected two-miles southwest of the Buckeye mine. The main shaft on the Stonewall has reached the depth of 290 ft. A level is being run at the bottom crosscutting the ledge. The Washington mine has been sold to an Eastern company. Hoisting works are to be erected and work prosecuted in earnest. The Chromo tunnel, belonging to Capt. J. A. Moore, has entered the ledge, and was in at last accounts, 34 ft, several of which was in fine ore. Cox & Coplin shaft is down 96 ft in good ore from top to bottom, some of which worked last week in Isabella mill, $312 per ton. Selected ore went much higher, some of it yielding dollars per pound. The Pilgrim has a vein three ft wide, some of it assays $3 per pound. The strike in the Southwest Alice, this week, is indicative of a big mine. A crosscut to the northwest at the depth of 100 ft has revealed a large body of chloride ore, in spar, and although in seven feet the footwall has not yet been reached. Isabella mill is now getting away with six to eight tons of ore daily, and every prospect for keeping up this desirable state of things indefinitely.

RICHMOND BASIN.—The Bilderbacks and Steve O'Neil are working the South La Plata and are getting ore which assays upward of $500. The La Plata shows well. It is sunk upon 30 ft below water level. The Nugget company are timbering their main shaft, which is down 100 ft. When that is done they will crosscut the ledge and also sink another 100 feet and again cut the ledge. The same company have also another shaft down 60 ft on a spur which runs from the Mack Morris side ground, and about 60 ft from the Mack Morris south line. It also shows good ore, silver glance, and will assay at least $1,000. The pay streak is two ft wide.

ITEMS.—From *Arizonian:* Charley Reyes, from Groom creek, reported last night. He has been endeavoring to free his shaft from water, but thinks he is getting the worst of it, and the fluid holds possession of four feet in the bottom of the shaft. At 50 ft he is taking out rich gold ore.

RICH STRIKE.—The *Star* is authority for the report that a rich find has been made on the east side of Huachuca and about eight miles from the camp. Over 30 locations have been made, which includes all of the valuable property. The ledges are very wide and a number of assays which have been made average $480 to the ton in silver. Although the discovery was only made a few days ago, there are over 100 men on the ground. There is considerable excitement in the district.

HANSHAW.—Work on the tunnel is now under headway. Twenty ft has already been opened. There are two openings, one on each side of the mountain. The size of tunnels is 10x4½ ft. Three shifts of men are at work night and day. The road from the mine to the mill site has been surveyed and is being graded; when finished the grade will be two and one-half inches to 100 ft. While there is plenty of surface water for all milling purposes, the company propose to run a ditch up the gulch in such a way as to dam in all the water from the gulch and slough. This will give them a supply which will be sufficient to meet any emergency, even a drought.

COLORADO.

GILPIN COUNTY.—*Register-Call*, Sept. 12: The Harkaway lode on Negro hill, near Central City, consists of 1,500 ft of contiguous property. It has been developed through a series of shafts ranging from 10 to 100 ft deep, and several levels from the main to the air shafts, east and west. A whim is being erected over the main shaft. A level is now being driven from No. 1 shaft east at a depth of 60 ft to connect with the main shaft. The output of pay material from this level is three tons per day, product of two miners' labor. The material prospects well enough in free gold by the simple process of panning, to yield under stamps 9 ounces gold per cord.

SILVER CLOUD LODE.—Georgetown *Courier*, Sept. 11: Located east of Terrible lode, on Sherman mountain. The upper level of the east part of the lode is in a vein of galena and blend six inches thick. Last mill run returned 450 oz., second class. Stoping west of main shaft in several small veins of ore averaging three inches solid with gray copper, valued at 200 oz.

LITTLE QUEEN LODE.—One-half mile west of Kokomo lode. Eighty feet wide and runs directly over the mountain. Adit at base of mountain is in 68 feet and shows a continuous ore vein the whole length with the exception of the first eight feet, the vein being in places 46 inches thick, and will average fully fully three feet. The ore is mostly decomposed and carries the carbonates of copper and some gray copper. There are also bunches of galena in it. None of the ore has yet been sold, there being about 30 tons on hand which is estimated to be worth $200 per ton in gold and silver. Assays as high as 13.12 oz. in gold and 239 oz. in silver have been obtained. About two-thirds of the ore vein is good milling ore, the remainder being chiefly quartz. The ground is soft, and with the exception of an occasional feldspar bar it can be worked without using powder. In drifting they are able to take out about two tons of ore per day.

WHITE MINE.—In the Cleary adit the breast shows ore scattered through the whole crevice and about three-fourths of the ground broken contains pay. The stope directly back of the breast is about 200 ft long, and for the first 50 feet shows a number of ore veins ranging from six inches in thickness downwards, the whole of which will aggregate about a foot of solid, besides a large amount of concentrating ore. At other places nearly the whole of the stope is a milling ore that will average 100 oz. per ton. This adit, when driven, showed but small quantities of ore for the most of the distance, but as the stope has been raised the quantity has continually increased until now it is very large. Two stopes have lately been started nearer the mouth and both are producing. The ore from this place mills from 100 to 300 oz., according to class.

CLIFFORD LODE.—This lode is near the top of the divide between Fall river and Nevadaville. Main shaft is down 165 feet, where a new level has been started. The ore vein ranges from 6 to 18 inches in thickness, and at the last sale gave a return of 535 oz., first class; 220 oz. second class, and 155 oz. third class. The company are sinking the discovery shaft, which has now reached a depth of 90 feet and shows a vein of ore from two to three inches thick, similar in character to that from the main shaft.

IDAHO.

ITEMS.—The *Statesman* says: The Rising Sun M. Co. has one bed of their arastra running on first class ore from the mine. The mine has been opened to a depth of 40 feet from the surface and for a considerable distance along the vein, and with these developments is showing a splendid body of ore. The long spell of excessively dry weather has reduced the water in Robie's gulch so that it is only practicable to run the arastra a few hours in the day. Al. Hoskins came down from his mine on Shaw's mountain and brought a piece of rock that glistened all over with gold. He has built a Stewart furnace 10 ft long and 8 ft wide. At Snake river the yield of bullion is quite large. Howes and Pitts ship about $1,000 per month. N. R. Woodworth is doing equally as well with small machines of 25 ft of plates per machine. Several machines are running with a capacity of 260 square feet.

THE *World* says: Ten tons of ore from the Golconda mine, situated at the head of More creek, arrived at Plowman's mill last Sunday.

Solving Metallurgical Difficulties.

EDITORS PRESS:—Although the milling of gold ores has been practiced in this country for more than thirty years, and has been conducted on the greatest scale, the theory of the process remains in doubt to this day.

In Austria, where a bath of quicksilver one-half to one inch thick was used to collect the gold, the tendency of opinion was to consider amalgamation as a mechanical act—the gold collected in the mercury simply because it was heavy enough to sink in it and thus remove itself from the rush of the pulp through the amalgamator. But the introduction of copper plates covered with a mere coating of amalgam, which has been the constant practice in American mills, has revived the theory that amalgamation is a chemical instead of a mechanical act.

This question is one of great practical importance. It is perfectly true that a mill furnished with a given set of amalgamating machines will do just as good work on one theory as on the other, but a proper understanding of this question must be arrived at before it can be possible to decide whether the machinery used is the best that can be had.

An impression is very common among miners that milling as now practiced does not give good results, and that better work could be done in a great many mills if we only knew how. This knowledge will never be arrived at until the mills subject themselves to close criticism, by ascertaining carefully the value of the ore by fire assay and comparing it with the mill returns.

This subject is one that I have already given attention to, but the facts in my possession are too limited to form a sound basis for conclusions. They also labor under the disadvantage of being derived from Colorado more than from California, and it is not necessary to tell your readers that the ores of the two districts are not the same.

I am anxious to obtain as large a number of assays of California gold ores as possible, and I appeal to the large body of practical men who read the PRESS to send me what they have, however few and however many.

My particular object is to ascertain how much silver there is in combination with the gold, as exhibited by the *fire assay*, and I shall be thankful for assays whether they represent ores that have been milled or not. When the ores have been milled I would like to know the number of tons, and if possible the yield in the mill, both of gold and silver. My intention is to accumulate a large number of assays in order to obtain average results that will be trustworthy. Assays of hydraulic gold and hydraulic gravels will be particularly useful, though the purpose of my inquiry is to ascertain the true character of the gold in the vein quartz.

I have no intention of probing business secrets, and in publishing only averages will be used, so that no criticism will be made on special mills. When a sufficient number of assays have been received, I intend to communicate the results and my conclusions upon them to the public.

To repeat, the items I desire to have are:

1. The amount of gold and silver in the ore by assay.
2. The return by the mill process.
3. The number of tons treated.
4. The name of the assayer.

For any information on this subject the sender will receive the thanks of yours very truly,

JOHN A. CHURCH, M. E.

115 Broadway, N. Y., Sept. 6th, 1879.

News in Brief.

THE insurrection in Cuba continues.

REPORTS from the Cassiar mines are still discouraging.

ENCOURAGING news is received from the mines in Alaska.

THE gold fever in Queens county, Nova Scotia, shows no abatement.

THE Banco del Comercio, of Havana, has suspended payment.

IT is reported that Suleiman Pasha died at Bagdad last Saturday.

THE Olocical Institute of the Kiel University has been destroyed by fire.

ENGLAND will have to import 16,000,000 quarters of wheat this year.

THE cotton operatives on strike at Ashton, Eng., number 8,000 to 10,000.

SANTA BARBARA narrowly escaped being destroyed by fire last Saturday.

WM. H. HOLMES, a pioneer, died at Oregon City, Or., last Saturday, aged 70 years.

EVERYTHING is quiet at Sitka, and the civil government is working smoothly.

THERE is a great scarcity of food in Kashgar and people are suffering severely.

LOW water has caused a suspension of navigation on Snake river in Oregon.

THE Washington county fair will open at Hillsboro, Or., on the 22d inst.

GREAT distress among the working classes in England is apprehended this winter.

THE British Residency has left Mandalay, fearing a repetition of the Cabul massacre.

SILVER in London, 51½d; consols, 97 11-16; 5% U. S. bonds, 105⅝; 4s, 105¼; 4½s, 108¼.

HOP picking on Puget sound is now fully under way, being mostly done by Indians.

GOLD to the amount of 28,000,000 francs will leave France for the United States this week.

FIVE new cases of yellow fever are reported at Morgan City, La., and two at New Orleans.

THE opening of the Industrial fair at Portland, Or., has been postponed until October 20th.

THE Austrians have begun the occupation of Novi Bazar, and have met with friendly receptions.

IN the second ballot at Bordeaux for member of the Chamber of Deputies Blanqui was defeated.

AT Liverpool wheat is quoted at 8s 9d@9s 7d for average California white, and 9s 7d@10s for club.

A MINER was found dead in the Savage incline at Virginia Sept. 16th, his flesh being fairly cooked.

ORDERS have been issued to the British troops to occupy Cabul with or without the Ameer's consent.

A TERRIBLE storm on the coast of Bolivia recently destroyed a great deal of property and some lives.

HANLAN and Courtney are to row on Chatauqua lake, N. Y., October 8th, for a purse of $6,000.

THE rural population of Roumania is suffering from famine caused by the failure of the maize crop.

IT is proposed in Cuba to import 25,000 to 30,000 Chinamen yearly until the number reaches 400,000.

No further steps are to be taken in the negotiations between Germany and the Vatican until the Prussian elections are over.

THE workings of the Stanton colliery, at Mahanoy Plane, Pa., are caving in, compelling the occupants of houses to vacate them.

IN San Francisco half dollars are quoted at 99½ buying, 99⅞ selling; trade dollars, 97 buying, 98 selling; Mexican dollars, 91 buying, 92 selling.

IN New York Government bonds were quoted at 101¾ for 4s of 1907; 102½ for 5s of 1881; 104¾ for 4½s; sterling, $4.82@4.84; silver bars, 111⅞; silver coin, ¼@1 discount.

THE Maryland Republican State Convention met at Baltimore Sept. 16th and nominated a full ticket, with James A. Cray, of Howard county, for Governor.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Northern Belle, Sept. 10th, $2,736 82; Martin White, Sept. 10th, $4,500 55; Hillside, Sept. 13th, $5,000; Independence, Sept. 12th, $3,500; Belle Isle, Sept. 15th, $25,100; Grand Prize, Sept. 15th, $4,800; Northern Belle, Sept. 13th, $4,538 08; Martin White, Sept. 14th, $4,700; Hillside, Sept. 18th, $4,700.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[FROM OFFICIAL REPORTS TO DEWEY & CO.'S MINING AND SCIENTIFIC PRESS PATENT AGENCY.]

FOR THE WEEK ENDING SEPTEMBER 9TH, 1879.

219,467.—GANG PLOW—Reuben Hart and M. P. Nicholson, Santa Maria, Cal.
219,512.—CAR TRUCK—W. E. Payton, Stockton, Cal.
219,521.—MITER BOX—J. Reid, Portland, Ogn.
219,520—PORTABLE ENGINE BOILER—H. W. Rice, S. F.
219,530.—FIRE-PLACE—F. A. Sage, St. Helena, Cal.
7,664.—CIGARS—Trademark—Sanderson & Horn, S. F.
2,060.—TRUE "SYRUP OF FIGS"—Label—W. Pinninger and R. E. Queen, Reno, Nev.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

GANG PLOW.—Reuben Hart and Milford P. Nicholson, Santa Maria, Cal. Dated Sept. 9th, 1879. No. 219,467. This invention consists in a novel method of mounting the plows upon a frame, and in a means for supporting the frame and plows upon ths bearing-wheels, so that they may be raised to entirely clear the ground, or lowered to make any depth of cut desired. The rear and front plows are capable of an independent motion, by means of separate levers, so that either front or rear plows may be elevated or depressed independent of each other. This construction has many advantages over the ordinary sulky or gang plows.

FIRE-PLACE.—Francis A. Sage, St. Helena, Cal. Dated Sept. 9th, 1879. No. 219,530. This invention consists in providing a supplemental flue, built beside the main flue, ths supplemental flue being connected with the back or arch of the fire-place by a series of openings or slots, which may be closed by dampers. An increased draft for any part of the fire may be maintained by removing the dampers from any of the openings, so that ths products of combustion may pass directly to the supplemental flue in case there is not a proper draft through the main flue. On removing or sliding any one of the dampers so as to uncover any one of the openings or slots, a current of air is immediately carried through the fire opposite the location of the opening, and the draft thereby induced assists combustion at that point.

CAR-TRUCKS.—Wm. E. Peyton, Stockton, Cal. Dated Sept. 9th, 1879. No. 219,512. This invention relates to improvements in that class of railway car-trucks in which the two axles of a truck are, to a certain degree, independent of each other, so that in rounding a curve there is no drag or friction of the wheels on the rails. The improvements consist in certain details of construction whereby very little change in existing conditions is made, while at the same time the front and rear axles are sufficiently independent of each other, so that there is no friction on the rails in rounding curves.

PORTABLE ENGINE BOILER.—H. W. Rice, 56 Bluxome street, San Francisco. Dated Sept. 9th, 1879. No. 219,523. This invention relates to certain improvements in portable engine boilers of that class known as "return-flue" boilers, in which a large flue near the bottom serves at once as a furnace and to convey the products of combustion to a rear combustion chamber, from which they are returned through small tubes above and at the sides of the main flue to the chimney and uptake at the front.

MAINE MINES.—The mines of Sullivan, Me., alluded to in a former issue, seem to be developing to a certain extent. We learn from the New York *Mail* that the Sullivan vein shows large amounts of highly encouraging sulphides, with a small amount of telluride ore. At Gouldsboro' the vein is well defined ore, galena and copper sulphides. About 300 tons of ore of all grades have been taken out. The ore is claimed to assay from 25 to 350 ounces per ton, but rock carrying five ounces per ton can be profitably worked. Stock of the mines of a par value of $10 is generally quoted at $1.50. The alleged richness and quantity of ore in these mines ought to send the Maine mining stocks just a little higher.

Quicksilver Mining Publication.

Memoir on the Mines and Works of Almaden, by M. H Kuss, M. E. Translated from the "Annales des Mines" for the MINING AND SCIENTIFIC PRESS, by S. B. CHRISTY.

CONTENTS.—PART I.—Geological Description of the Deposits at Almaden: 1. Introduction; 2. Geological Situation and Constitution; Silurian System; Devonian System; Eruptive Rocks; 3. Deposits of Mercury; Description of the Mine; Mineralogical Constitution of the Vein Matter; Age of the Veins; Abandoned Mines. PART II.—Exploitation of the Mines of Almaden: 1. Method of Exploitation; 2. Organization of Labor; 3. Mechanical Preparation. PART III.—Metallurgy of Mercury at Almaden: 1. Description of the Works; 2. Treatment of the Ore; 3. Losses of Treatment. PART IV.—Administration and History; 2. History; 48 large pamphlet pages, post-paid, 50 cents. DEWEY & CO., Publishers, S. F., 1879.

Back Numbers Wanted.

The following volumes and singlo copios of the MINING AND SCIENTIFIC PRESS are wanted at this office, for which a reasonable price is offered:

Year.	Volume.	
1870	20	2 Complete volumes, 1st half (of year).
1870	20	2 Copies of No. 2, Jan. 1st.
1870	20	1 Copy each of No. 1, Jan 1st, 3 of Jan. 14th, 7 Feb. 11th, 6 Feb. 4th.
1870	21	1 Copy of No. 7, August 13th.
1871	22	5 Copies of No. 1, Jan. 7th.
1871	22	3 Copies of No. 5, Feb. 4th.
1871	22	1 Copy of No. 3, Jan. 21st, 6 of Feb. 2d, and 1 of May 1st.
1871	23	1 Copy of No. 2, July 15th, and 0 Sept. 2d.
1872	24	2 Copies of No. 4, Jan. 27th.
1872	24	3 Copies of No. 7, Feb. 17th.
1872	24	2 Copies of No. 17, April 27th.
1872	25	1 Copy of No. 10.
1872	25	1 Gomplete volume, last half (of year).
1873	26	3 Copies of No. 8, Feb. 22d.
1873	26	3 Copies of No. 9, March 1st.
1873	26	2 Copies of No. 10, March 8th.
1873	26	1 Copy of No. 7, Feb. 15th.
1873	27	3 Copies of No. 20, Nov. 15th.
1873	27	4 Copies of No. 21, Nov. 22d.
1873	27	3 Copies of No. 24, Dec. 13th.
1875	30	1 Cepy of No. 4, Jan. 23rd.
1875	30	1 Copy of No. 5, Jan. 30th.
1875	30	1 Copy of No. 8, Feb. 20ta.

OUR AGENTS.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influenos and encouraging favors. We intend to send none hut worthy men.

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EVERY new subscriber who does not receive the paper, and every old subscriber not credited on the label, within two weeks after paying for this paper, should write personally to the publishers without delay, to secure proper credit. This is necessary to protect ourselves and subscribers against the acts and mistakes of others.

LARGEST BOOK PUBLISHER.—The new edition of Webster's Unabridged Dictionary, just issued, is believed to be, in the quantity of matter it contains, by far the largest volume published. It now contains about 118,000 words defined, and nearly 15,000 words and meanings not found in any other one dictionary. The Biographical Dictionary, just added, supplies a want long felt by the reader and student, in giving the desired information so briefly. Never was any one volume so complete as an aid in getting an education.

REDDING, July 12th, 1870.

MESSRS. DEWEY & CO.—*Gentlemen:*—Have received my letters patent for the har roller to-day. I am very much obliged to you for your prompt service, and will recommend you to all who may want your assistance.

I remain yours, etc., GEO. MEDING.

FRESH attractions are constantly added to **Woodward's Gardens**, among which is Prof. Gruber's great educator, the Zoographicon. Each dopartment increases daily, and the Pavilion performances are more popular than ever. All now novelties find a place at this wonderful resort. Prices remain as usual.

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EXPERIMENTAL MACHINERY, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. Sco ad. F. W. FULLER, 415 Market St., second floor, S. F.

Chew JACESON'S BEST Sweet Navy Tobacco

LEATHER.

[WHOLESALE.]
WEDNESDAY, M., September 17, 1879.

Sole Leather, heavy, lb	22 @ 29
Light	20 @ 24
Jodot, 8 Kil., doz	48 00 @50 60
11 to 13 Kil	65 00 @76 00
14 to 19 Kil	80 00 @90 00
Second Choice, 11 to 18 Kil	65 00 @70 00
Cornellian, 12 to 16 Kil	67 00 @67 00
Females, 12 to 13 Kil	63 00 @67 00
14 to 16 Kil	71 00 @76 00
Simon Ullmo, Females, 12 to 13 Kil	58 00 @62 50
14 to 15 Kil	66 00 @70 00
18 to 17 Kil	72 00 @74 00
Simon, 18 Kil	61 00 @63 00
20 Kil	65 00 @67 00
24 Kil	72 00 @74 00
Robert Calf, 7 and 9 Kil	35 00 @40 00
Kips, French, lb	1 00 @ 1 35
Cal. doz	40 00 @60 00
French Sheep, all colors	8 00 @15 00
Eastern Calf for Backs, lb	1 00 @ 1 25
Sheep Roans for Topping, all colors, doz	9 00 @13 00
For Linings	6 50 @10 50
al. Russet Sheep Linings	1 75 @ 4 50
oot L egs, French Calf, pair	4 00 @— —
BGood French Calf	4 00 @ 4 75
Best Jodot Calf	6 00 @ 6 25
Leather, Harness, lb	15 @ 38
Fair Bridle, doz	48 10 @72 00
Skirting, lb	33 @ 37
Welt, doz	30 00 @50 00
Buff, ft	38 @ 21
Wax Side	07 @ 80

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & CO.]

SAN FRANCISCO, September 17, 3 P. M.

SILVER, 25.
GOLD BARS, 890@910. SILVER BARS, 5@16 ⅌ cent. discount.
EXCHANGE on New York, 20, on London bankers, 49½@49¾. Commercial, 50; Paris, five francs ⅌ dollar; Mexican dollars, 90½.
LONDON Consols, 97¼; Bonds (4%), 102@102¼.
QUICKSILVER in S. F., by the flask, ⅌ in, 33½c.

GENERAL MERCHANDISE.

[WHOLESALE.]
WEDNESDAY M., September 17, 1879.

CANDLES.

Crystal Wax	17 @—
Eagle	12 @—
Patent Sperm	30@—

CANNED GOODS.

Assorted Pie Fruits, 2½ lb cans	2 25 @ —
Table do	3 50 @ —
Jams and Jellies	3 75 @ —
Pickles, hf gal	3 25 @ —
Sardines, qr box	1 67½@1 90
Hf Boxes	2 50 @2 75
Merry, Faidl & Co.'s. Preserved Beef, 2 lb. doz	3 75 @4 00
do Beef, 4 lb. doz	6 50 @ —
Preserved Mutton, 2 lb. doz	3 75 @ —
Beef Tongue	6 50 @ —
Preserved Ham, 2 lb. doz	6 50 @ —
Deviled Ham, 1 lb, doz	5 50 @ —
do Ham, ½lb doz	3 00 @ —
Boneless Pigs Feet, 3 lbs	4 50 @ —
2 lbs	3 75 @ —
Spiced Fillets, 2 lbs	4 25 @ —
Head Cheese, 3 lbs	4 25 @ —

COAL—Jobbing.

Australian, ton	8 00 @ 6 50
Coos Bay	— @ 5 50
Bellingham Bay	— @— —
Seattle	5 50 @ 6 00
Cumberland	12 00 @15 00
Mt. Diablo	4 75 @ 6 00
Lehigh	11 50 @12 50
Liverpool	6 00 @ 5 50
West Hartley	— @ 8 00
Scotch	— @ 8 00
Scranton	@— —
Vancouver Id	6 00 @— —
Charcoal, sack	75 @— —
Coke, hush	60 @— —

COFFEE.

Sandwich Id, lb	— @— —
Costa Rica	16 @ 16½
Guatemala	16 @ 16½
Java	25 @— 28
Manila	17 @— —
Greund, in cs	25 @— —

FISH.

Sac'to Dry Cod	— @ 4
do in cases	5 @ 8
Eastern Cod	— 7 @— 7½
Salmon, bbls	8 00 @ 9 00
Hf bbls	5 00 @ 6 50
1 lb caus	1 10 @ 1 12½
Pkld Cod, bbls	22 00 @— —
Hf bbls	11 00 @— —
Mackerel, No. 1, Hf Bbls	9 50 @10 00
In Kits	1 85 @ 2 10
Ex Mess	3 25 @— —
Pkld Herring, hx	3 00 @ 3 50
Boston Smk'd H'g	70 @— —

LIME, Etc.

Plaster, Golden Gate Mills	3 00 @ 3 25
Land Plaster, tn	10 00 @12 50
Lime, Sta Cruz, hbl	1 25 @ 1 50
Cement, Rosendale	2 00 @ 2 25
Portland	4 00 @ 4 50

NAILS.

Ass'ed sizes, keg	2 70 @ 2 75

OILS.

Pacific Glue Co's Neatsfoot, No 1	1 00 @ 90
Castor, No 1	1 35 @ —
do, No. 2	1 30 @ —
Baker's A A	1 25 @1 30
Olive, Plagniol	5 25 @6 75
Possel	4 75 @5 25
Palm, lb	9 @ —
Linseed, Raw, bbl	78 @ —
Boiled	80 @ —
Cocoanut	55 @ —
China nut, cs	— @ 65
Sperm	1 40 @ —
Coast Whales	— @ 32½
Polar	— @ 35
Lard	— @ 70
Oleophine	22 @ 22
Devoe's Brll't	17½@ 18½
Photolite	— @ —
Nonpariel	31 @ 32½
Eureka	18 @ 42½
Barrel kerosene	20 @ —
Downer Ker	35 @ —
Elaine	37½@ —

PAINTS.

Pure White Lead	8 @ 8½
Whiting	1½@ —
Putty	4 @ 6
Chalk	1½@ —
Paris White	2½@ —
Ochre	3½@ —
Venetian Red	3½@ —
Averill Mixed Paint, gal. White & tints	2 00 @2 40
Green, Blue & Ch Yellow	3 00 @3 50
Light Red	3 00 @3 50
Metallic Roof	1 30 @1 50

RICE.

China, Mixed, lb	4½@ 5
Hawaiian	6 @ —

SALT.

Cal. Bay, ton	15 00 @22 50
Common	10 00 @12 00
Carmen Id	12 00 @14 00
Liverpool fine	19 00 @— —

SOAP.

Castile, lb	8 @ 15
Common brands	4½@ 6
Fancy brands	7 @ 8

SPICES.

Cloves, lb	— @ 45
Cassia	19 @ 20
Nutmegs	85 @ 87½
Pepper Grain	— @ 12
Pimento	19 @ 20
Mustard, Cal., ½ lb glass	— @1 25

SUGAR, ETC.

Cal. Cuhe, lb	— @ 10½
Powdered	— @ 10½
Fine crushed	— @ 10½
Grnsnulated	— @ 10
Golden C	— @ 8½
Cal. Syrup, kgs	70 @ —
Hawaiian Mol'sses	26 @ 30

TEA.

Young Hyson, Moyune, etc	— @ 51
Country pckd Gunpowder & Imperial	— @ 42½
Hyson	30 @ 35
Fooo-Chow C	35 @ —
Japan, 1st quality	40 @ —
2d quality	20 @ 2

METALS.

[WHOLESALE.]
WEDNESDAY M., September 17, 1879.

IRON.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	26 50 @— —
Refined Bar	2½@ 3½
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 7
Norway, according to thickness	6½@ 7
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @— —
STEEL.—	
English Cast, lb	18 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @
TIN PLATES.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft, 7 to 10, lb, less than cask	9½@— 10
NAILS.—	
Assorted sizes	2 90@3 00

LUMBER.

WEDNESDAY M., September 17, 1879.

CARGO PRICES OF REDWOOD.

Rough, M	13 00
Refuse	9 00
Clear	23 00
Clear Refuse	13 00
Rustic	23 60
Refuse	18 00
Surfaced	20 00
Refuse	14 00
Flooring	20 00
Refuse	12 00
Beaded Flooring	23 00
Refuse	13 00
Half-inch Siding	16 00
Refuse	14 00
Half-inch Surfaced	20 00
Refuse	14 00
Half-inch Battens	16 00
Pickets, Rough	11 00
Rough, Pointed	12 50
Fancy, Pointed	18 00
Shingles	1 76

PUGET SOUND PINE

RETAIL PRICE.

Rough, M	18 00
Fencing	18 00
Flooring and Step	28 00
Narrow	30 00
2d quality	25 00
Laths	3 50
Furring, lineal ft	

REDWOOD.

RETAIL PRICE.

Rough, M	18 00
Refuse	14 00
Pickets, Rough	15 00
Pointed	16 00
Fancy	22 50
Siding	20 50
Surfaced & Long Beaded	30 00
Flooring	30 00
Refuse	22 50
Half-inch Surfaced	30 00
Rustic, No. 1	30 00
Battens, lineal ft	
Shingles M	2 00

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending September 16, 1879.

HIGHEST AND LOWEST BAROMETER.

Sept. 10	Sept. 11	Sept. 12	Sept. 13	Sept. 14	Sept. 15	Sept. 10
29.011	29.002	29.091	30.033	30.093	30.043	29.966
20.868	20.031	29.985	29.080	30.016	29.031	29.900

MAXIMUM AND MINIMUM THERMOMETER.

77	86	76	70	62	65	64
57	60	62	57	53	63	62

MEAN DAILY HUMIDITY.

53	48.3	50.7	72.3	82	81	86

PREVAILING WIND.

NW	N	W	W	W	W	W

WIND—MILES TRAVELED.

108	76	134	134	287	250	207

STATE OF WEATHER.

Clear.	Clear.	Clear.	Fair.	Fair.	Fair.	Fair.

RAINFALL IN TWENTY-FOUR HOURS.

Total rain during the season, from July 1, 1879,	0.03 in.

Mining and Other Companies.

Persons interested in incorporated ehares will do well to recommend the publication of the official notices of their companiee in this paper, as the cheapest appropriate medium for the eame.

Butte Hydraulic Mining Company.—Principal place of business, San Francisco, California. Location of works, Butte county, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 25th day of August, 1879, an assessment of Ten Dollars per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, Room 20, No. 328 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 29th day of September, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the 21st day of October, 1879, to pay the delinquent assessment, together with the cost of advertising and expenses of sale.

L. L. DENNERY, Secretary.
Office, Room 20, No. 328 Montgomery st, S. F. Cal.

Gover Mining and Milling Company.—Location of principal place of business, San Francisco, California. Location of works, near Drytown, Amador County, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 39) levied on the sixth (0th) day of August, 1879, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Am't.
Ashby, Mark F, Trustee	007	1341	8670 50
Ashby, Mark F, Trustee	008	800	400 00
Brayton, M L	847	400	200 00
Brayton, M L	901	115	57 50
Gorrie, Thomas	682	10	5 00
Pratt, Freeman	490	10	5 00
Preble, Edward E	880	45	22 50
Knox, Joseph A	607	100	50 00
Knox, Joseph A	671	50	25 00
Knox, Joseph A	572	50	25 00
Knox, Joseph A	573	50	25 00
Knox, Joseph A	728	30	19 50
Skinner, E C	441	100	50 00
Skinner, E C	019	100	50 00
Skinner, E C	020	50	25 00

And in accordance with law and an order of the Board of Directors, made on the sixth (0th) day of August, 1879, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, room 8, No. 402 Front street, San Francisco, California, on Monday, the sixth (0th) day of October, 1879, at the hour of one (1) o'clock P. M. of such day, to pay delinquent assessments thereon, together with costs of advertising and expenses of the sale.

W. C. WILSON, Secretary.
Office, Room 8, No. 402 Front street, San Francisco, Cal

Annual Meeting.—Syndicate Mining Co., of Bodie, Mono County, California.

The annual meeting of the above named Company will be held at the office, Room 20, Hayward's Building, 410 California street, San Francisco, Cal., on Thursday, October 16th, 1879, at 1 o'clock P. M., for the purpose of electing a Board of Directors to serve for the ensuing year, and for the transaction of such other business as may properly come before the meeting. Also in accordance with a resolution adopted at a meeting of the Board of Directors, held September 15th, 1879, to take into consideration and decide upon the proposition to increase the capital stock of said Company, from Five Million Dollars divided into fifty thousand shares at the par value of one hundred dollars per share, the present capital of the Company, to Ten Million Dollars, to be divided into one hundred thousand shares of the par value of one hundred dollars each.

THOS. G. TAYLOR,
ROBT. N. GRAVES,
GEO. W. HOPKINS,
GHAS. H. FISH,
} Directors.

The transfer books will be closed October 8th, 1879, at 3 P. M.

JACOB STACTFELC, JR., Secretary.

Amusements.

CALIFORNIA THEATER.

BARTON & LAWLOR.....Manager.
BARTON HILL.....Acting Manager.

THE COLOR GUARD.

Bush Street, above Kearny. Open every evening. Box office open from 9 A. M. to 10 P. M. Seats may be secured six days in advance.

BALDWIN'S THEATER.

THOMAS MAGUIRE.....Manager.
CHAS. H. GOODWIN.....Treasurer.
J. P. GHAPMAN.....Assistant Treasurer.

Corner Market and Powell Streets. Open every evening and Saturday matinee. Box office open daily.

BUSH STREET THEATER.

CHAS. E. LOOKE.....Lessee and Manager

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UNITED STATES
Mineral Land Laws, Revised Statutes
AND INSTRUCTIONS AND FORMS UNDER THE SAME.

We have just issued a pamphlet containing the General Mineral Land Laws of the United States, with instructions of the Commissioner of the Land Office. The contents of this pamphlet comprise all of the Government laws with relation to mineral lands of interest to the mining community, as follows: Mining Statute of May 10th, 1872, with Instructions by the Commissioner of the Land Office; Mining Statute of July 26th, 1866; Mining Statute of July 0th, 1870. Forms required under Mining Act of May 10th, 1872, as follows: Notice of Location; Request for Surveys; Application for Patent; Proof of Posting Notice and Diagram of the Claim; Proof that Plat and Notice remained Posted on Claim during Time of Publication; Registers' Certificate of Posting Notice for Sixty Days; Agreement of Publisher; Proof of Publication; Affidavit of $500 Improvements; Statement and Charge of Fees; Proof of Ownership and Possession in Case of Loss or absence of Mining Records; Affidavit of Citizenship; Certificate that no Suit is Pending; Power of Attorney; Protest and Adverse Claim; Non-Mineral Affidavit; Proof that no Known Veins Exist in a Placer Claim, etc. There is also given the U. S. Coal Land Law and Regulations thereunder. The work comprises thirty pages, and will be sold, postfree, for 60 cents. It should be in the hands of every one having any mining interests. DEWEY & CO.,
Publishers of the MINING AND SCIENTIFIC PRESS, S. F

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HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

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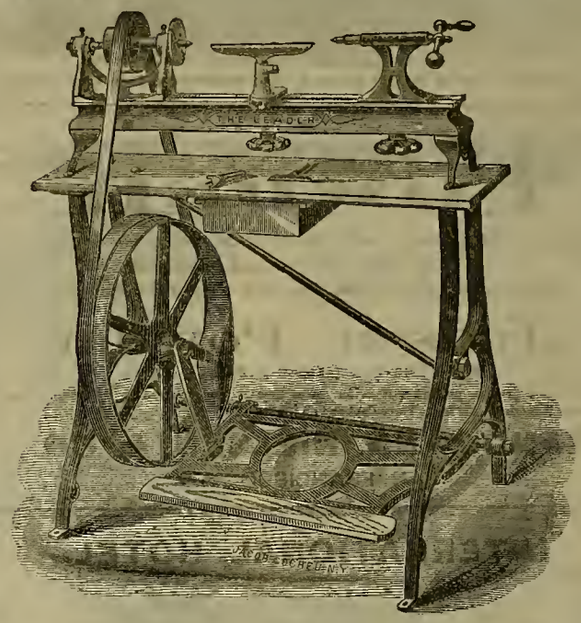
Lathe Without Saw Attachments.

This lathe has been made especially to meet a want felt by many for a really good and substantially made Foot-Lathe at a reasonable price, and we think that we can safely say that it is by far the best Lathe ever placed on the market at the price asked. The bed, head, and tail stocks are of iron; the spindles of steel. The bearing of the head stock is conical, so that the wear can be easily taken up.



Material eighteen inches long and eight inches in diameter can be turned upon it. The pieces that accompany this Lathe without extra charge are two T rests, two plain centers, one spur center for wood turning, and one face plate.

Price of Lathe without Saw Attachments.....$45. Price of Lathe WITH SCROLL Saw Attachment.....$55.
Price of Lathe with both Scroll and Circular Saws, $70.

Trump Drill Chuck.

Chuck for drills ½ and under, Price.....$1.50
Chuck, for drills ¼ and under, Price.....$2.25
They are made on solid steel plug, centered and *readily fitted to Lathe or Drill Press.*
SEND FOR CIRCULAR.

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LEA AND PERRINS' SAUCE,

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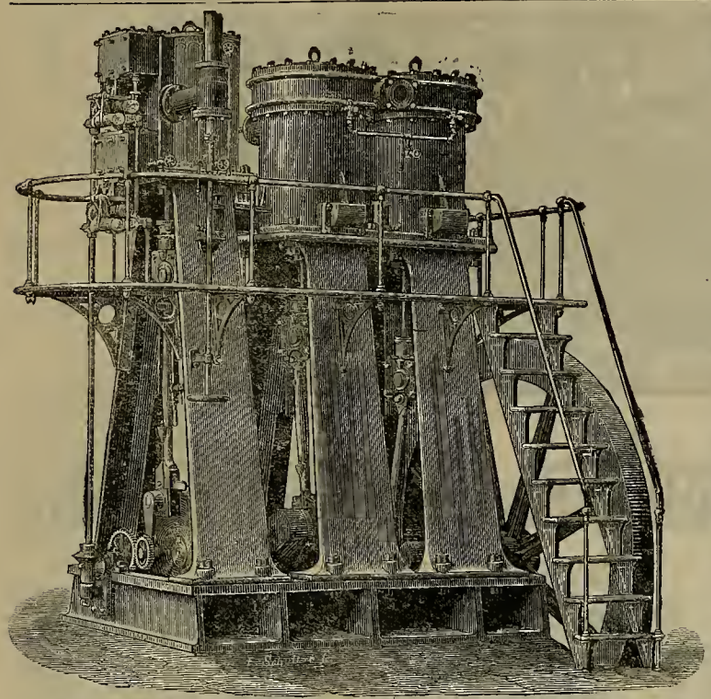

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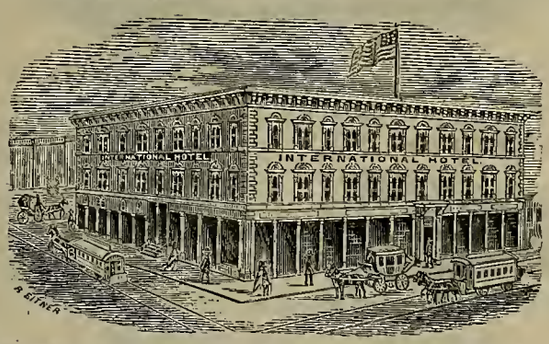

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An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, SEPTEMBER 27, 1879. VOLUME XXXIX Number 13.

Colorado River Canyons.

We give an illustration on this page of the Mu-av canyon, a side gorge of the Grand canyon of the Colorado. It is impossible for a mere description to convey any but a faint idea of the sublimity that lines the banks of the Colorado of the West. The walls rise in many instances more than a mile in hight, a thousand feet of which is up through granite crags, then steep slopes and perpendicular cliffs rise one above another to the summit. The gorge is black and narrow below, red and gray and flaring above, with crags and angular projections on the walls, which, cut in many places by side canyons, seem to be a vast wilderness of rocks. The waters of the river rush their winding way through the gloomy depths, plunging over steep declivities with a mad roar, spreading out into a placid bosom in some opening beyond. Clouds play in the canyon, or roll down in great masses filling the gorge with gloom, sometimes hanging above from wall to wall, covering the canyon with a roof of impending storm.

Ever and anon a gust of wind sweeps down a side gulch, making a rift in the clouds, and revealing the blue heavens. In some localities volcanic evidences accumulate. Great quantities of cooled lava, and many cinder cones are seen on either side, and then comes an abrupt cataract. Just over the fall a well-defined crater stands on the very brink of the canyon. From this volcano vast floods of lava have doubtless been poured over the canyon wall, where the cataract now rushes. The whole north side, as far as the eye can reach, is lined with the black basalt, and high up on the opposite wall are patches of the same material resting on the benches, filling old alcoves and caves. Directly under the volcanic cone the rocks are broken in two along a line which crosses the river, and the beds have dropped 800 feet on the lower side of the line forming a fault.

Prof. J. W. Powell, in his report on the Colorado of the West, in referring to the volcanic features in one of the canyons, says: "We have no difficulty as we float along, and I am able to observe the wonderful phenomena connected with this flood of lava. The canyon was doubtless filled to a hight of 1,200 or 1,500 feet, perhaps by more than one flood. This would dam the water back; and in cutting through this great lava bed, a new channel has been formed, sometimes on one side, sometimes on the other. The cooled lava, being of firmer texture than the rocks of which the walls are composed, remains in some places; in others a narrow channel has been cut, leaving a line of basalt on either side. It is possible that the lava cooled faster on the sides against the walls, and that the center ran out; but of this we can only conjecture. There are other places, where almost the whole of the lava is gone, patches of it only being seen where it has caught on the walls. As we float down, we can see that it ran out into side canyons. In some places this basalt has a fine, columnar structure, often in concentric prisms, and masses of these concentric columns have coalesced. In some places, when the flow occurred, the canyon was probably at about the same depth as it is now, for we can see where the basalt has rolled out on the sands, and, what seems curious to me, the sands are not melted or metamorphosed to any appreciable extent. In places the bed of the river is of sandstone or limestone, in other places of lava, showing that it has all been cut out again where the sandstones and limestones appear; but there is a little yet left where the bed is of lava.

"What a conflict of water and fire there must have been here! Just imagine a river of molten rock, running down into a river of melted snow. What a seething and boiling of the waters; what clouds of steam rolled into the heavens!"

A New Mining Review.—The first number of the *Colorado Mining Review*, published by Warder Cumming, at Denver, Colorado, comes to us with its columns full of information concerning the mining interests of that State. It has a pleasant, cheerful appearance, and we wish success to the new enterprise in its important and growing field of observation.

Division of Electric Light.

At the late meeting at Saratoga of the American Association for the Advancement of Science, Mr. Edison, in his address, alluded to the results attained by him in solving the question of the practical divisibility of the electric light. As reported in No. 194 of the *Scientific American Supplement*, page 3,089, he says: "I am enabled by the increased capacity of platinum to withstand high temperature, to employ small radiating surfaces, and thus reduce the energy required per candle light. I can now obtain eight separate jets, each giving out an absolutely steady light and equal to 16 standard candles, or a total of 128 candles, by the expenditure of 30,000 foot pounds of energy, or less than one horse power." We are not prepared to say whether this is or is not a wonderful achievement. Without making any comparisons and leaving all to draw their own conclusions, we give the result of experiments of which we were an eye witness at the *atelier* of Messrs. Molera & Cebrian in this city. The light used by them was a 4,000-candle electric light, enclosed in a chamber, on one side of which was a 24-inch Fresnel lens, from which the light is projected in parallel lines. The whole or any number of these lines or rays of light may be collected on a mirror or reflecting surface of any kind, and distributed in any greater or less intensity through secondary lenses without additional loss. In the experiment hardly one-half of the main light was collected, but it was divided into 16 separate lights, equal to 80 candles each. The secondary lenses were of small size, and situated in the ceiling, the light being thrown down. The quality of the light was equal to pure diffused daylight—in fact, several hundred shades of silk, arranged upon cards and placed side by side, could be distinguished as readily as by sunlight. Had it not been for the loss of light, occasioned by the size of the reflecting mirrors, we believe the light could have been subdivided to its fullest extent and into at least 50 separate lights. The whole light from the main lamp can be divided and subdivided, and distributed down to a single ray even, at pleasure. The dispersing lenses and reflectors are arranged inside the building so as to illuminate every part, without any obscure corners. In the open air, the rays of light thrown upon objects over a mile away, in the darkness of night, brought them into view with startling distinctness.

Consolidation of California Hydraulics. The last issue of the *Bullion* has the following editorial paragraph which contains its own information: We are advised of the probable consolidation, under the auspices of a New York promoting company, of several of the most important hydraulic and drift or gravel mines in California. The proposed consolidation will, if effected, constitute by odds the largest gold property in the world, and one of the best equipped. The originators of the enterprise have been quietly bonding properties so connected that the same water can be used two or three times, and that other facilities, such as tunnels, drifts and flumes, can be used more fully. The project is to virtually place one entire grand mining district, that has some hundreds of managers, most of them mutually antagonistic, under one management. This seems to us by far the most important mining enterprise broached this season. As the bonds have been taken very low, in all probability, and the new management will be able to doubly use facilities, it is likely to prove immensely profitable to the managers, but at the same time the product of gold from this already important district will be largely increased.

MU-AV CANYON.

Determining Slag Densities in Smelting.

Prof. Abich was the first to point out the relation existing between the composition of volcanic rocks and their densities, and to show that, the latter being ascertained, very correct conclusions might be drawn as to their content of silica. The general rule is that the most silicious rocks are the lightest, and the most basic have the highest specific gravity. Thomas Macfarlane, in a paper read at the Pittsburg meeting of the American Institute of Mining Engineers, says that from this general rule it occurred to him that by determining the density of slags it might be possible to judge more accurately of their nature than by observing merely their superficial appearance. In smelting copper, lead and silver ores, it is scarcely possible in every case to make analysis of the various parcels of ore, with the view of combining these and the fluxes, so accurately as to yield, in the furnace, slags of exactly the most favorable composition. This is even more difficult with ores which require previous calcination, or with mattes which have been roasted in heaps. Even in cases where the greatest pains have been taken and the most elaborate calculations made beforehand, it frequently happens that variations in the working of the furnace interfere with the result so much desired. Generally, the practical metallurgist must be content with ascertaining the average composition of his ores and fluxes, making a calculation, once for all, as to the most advantageous mixture, and leaving slight changes in its composition to be taken care of as it is passing through the furnace. The various products then afford him the best material whereon to base his judgment as to the manner in which his smelting mixture and furnace are working. Of course, the character of the slag is one of his chief guides, but it is not always possible, from its outward characters alone, to form a correct judgment as to its composition. Neither would it be possible or practicable to apply chemical analysis for this purpose, as it would be impossible to wait for its results while working a furnace. Hence, Prof. Macfarlane proposes to determine the density of slags, so as to judge of the manner in which a furnace and its contents are working.

From numerous experiments made in silver, copper, lead and iron ores, it was ascertained that there was a gradual increase of density as the silica decreased, but the rule was not absolute, and only applicable where the relative quantity of the different bases in a slag remains the same. In smelting ferruginous ores, and lead and copper mattes, the quantity of protoxide of iron in the slag, in proportion to the other bases, is usually greater, and this increases its density, although the percentage of silica may remain the same. An examination of a slag from smelting lead matte showed an increase of 7.53% in the ferrous oxide, causing considerable increase in density, while the silica remained nearly the same.

The general rule, however, holds good, that the density in slags increases as their percentages of silica decreases. To illustrate—the smelting furnace is furnished with a tapping-hole at the bottom, besides the usual "lead well" and slag spout. The tapping occasions no difficulty, and so long as the slag is not allowed to become too heavy, no incrustations are deposited in the furnace. The charging is managed in the following way: The smelting mixture is made up of ore and fluxes, and is calculated to yield a slag containing 32% of silica. The slag necessary to keep the charge open is added separately, in the proportion of about one-third of the smelting mixture. When the furnace yields a slag of greater density than 3.8, the proportion of added slag is decreased. The latter is, on the other hand, increased when the slag produced is lighter than 3.6. By ascertaining the specific gravity of the slage frequently, and altering the charge in the manner described, the furnaces are found to work regularly and satisfactorily. Of course, attention to the composition of slags alone will not enable the smelting to be done in the best possible manner. The metallurgist has many points to consider at one and the same time while conducting smelting operations. Ascertaining approximatively the amount of silica in slags, with comparative ease and accuracy, is only one of these points.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Valuable Salt Works.

EDITORS PRESS:—Twelve miles southeast of New Boston and eight northeast of Belleville, in the center of one of the lerge, even valleys of Nevada, is a salt lake or marsh of remarkahle featurss, and one of probahly great economic value in the future of the country. During the winter it is a shallow lake, hut in the summer dries to a level with the earthy surface. Its size ie about a mile and a half in width and three miles in length. It is called Rhodes Marsh, after the active man who has taken the principal part in its development, as well as of a number of other important enterprises in the region. Probably no purer salt can he found in any part of the world than is found here. Facilities for its manufacture are very peculiar.

The mareh is underlaid everywhere at the depth of four or five feet by a hardpan of solid ealt, up through which, by thousands of small holes—some few large, five or six inches in diameter—rises, during the summer evaporation, the clearest of waters, charged to its ntmost capacity with salt in solution. Now, by simply digging pits, like tanners' vats, into the hardpan, and clearing all off smooth, the workmen see the pure hrine flowing in of itself to fill the pit nearly full. Evaporation then hegins and the salt eoon commences to crystallize and fall to the hottom, in form like the cleanest, whitest sand possihle. This process goes eilently hut continually on for weeks, till the pits may be filled two or three feet deep with the very purest ealt known, when men dressed in gum garments go into the pits and shovel out the accumulated deposits for market all fit for use. Yet, if a finer article for the table is needed, a eimple salt-mill near the works reduces the material to the hest pulverized salt in the world.

We were greatly interested in all we saw when riding with the superintendent, Mr. Wasam, over this marsh, along its winding roads among the many pits; for solid wagon-roads are everywhere easily made by slightly throwing up the quickly drying, salt-hardened earth. The vats appeared of the richeet, light yellow color, as the pure salt was seen at the bottom throngh the clear hriny liqnid, while the heaps and ridges shoveled out upon the hanks were white as snow.

At the Philadelphia Centennial, this salt, taken directly from the vats as nature alone had deposited it, with no artificial improvement whatever, received the first premium as the best in the exhihition. Thousands and millions of tons can here he gathered, and exported to meet the wants of the whole coast. As soon as the Reeee River railroad, from Battle Mountain, ehall be completed through to near this place, an immense quantity of this hest of salt must be yearly gathered and exported for use.

Bnt besides the salt in this marsh, there are also in some parts large deposits of horax, from which hundreds of tone of the hest quality have been manufactnred. But the expense of freighting the teame long distances has rendered it difficult to compete at present with other placee of its production nearer market. Yet with a railroad, all such difficulty will be removed and the borax of this marsh hecome an important article of trade.

Another fact of great interest is that at a ehort distance around this marsh the dry, rich, sage-brush surface of the valley has helow it, at the depth of only 8, 12 or 15 feet, an abundance of good fresh water, so that by means of simple, home-made windmills, fine farme, from 10 to 50 acres, could easily he cultivated by irrigation in highest perfection, whenever snch cultivation shall be needed. Should a salt-lake city here ever spring up, it could easily thus eecure its eupplies of fresh home provisions.

We must also include in this article a short account of the one mining locality of well-developed claims in this region; for while there are numerous fine-appearing leads in this vicinity, yet, mainly for the want of water, Bellville, with its mining camp, Candaleria, is the only point where for years vigorous and successful work in mining has heen carried on. This town is to the eouthwest eight miles, over a slight elevation, and in the mountain range, located at this place, hecause here, from a distance of 12 miles, water, through iron pipes, could he brought in sufficient quantity to supply the necessities of the crnshing mills and village of lahorers. Here, therefore, good water can he had, yet its regular price is 2 cents a gallon, or about 10 cents the pail.

Bellville is a moderately pleasant village, of perhaps 600 psople, all in lightly-constructed buildings, for temporary residence, as if hoping to make sufficient money to migrate to greener parts. Not a street can be sprinkled, nor yard irrigated, nor ornamental tree cultivated, for there is no water for these purposes. Residences for the principal managers of the mills—two or three rather pleasant frame buildings—have heen put up, but these are the only painted buildings in the place. There is no miuing done here, only the reduction of ore in the two large 40-stamp mills, one only of which is kept constently rnnning. This ore is hauled hy teams seven miles, from the mining locality southeast, called Candaleria. At this point water is only hed hy hanling anothcr seven miles, from Columhus, farther to the sontheast, and is sold for 5 cents per gallon, or 25 cents a pail. Still, a thriving, husy town has sprung up, very near the same size as Bellville. Black, irregular, hasaltic hills rise around it, rugged and romantic; hut its rich mines lie just to the south, in a grand precipitous rocky range, rising from the very edge of the little village, near a thousand feet in hight, so steep as to he difficult or even dangerous to crawl up. The principal claim is that of the Northern Belle, finely developed and paying regularly large dividends, as all specially interested in mining stocks already know. The company owning this claim has secured, also, other valuable ones, and own the mills at Bellville. The Victor is a fine separate claim, in which the controlling interest is possessed hy Mr. Rhodes, of the salt marsh and of New Boston. The ore is hauled from this mine nearly 20 miles west, to Marietta, for crushing. The hauling is done mostly by Mr. Rhodes' own teams, for which he has over 100 excellent mules and horses, providing for them convenient yards, stable and needed shops complete, the best arranged and hest managed we have seen in the State. We did not go into thie claim, but the reports of all were in agreement as to its great value.

Just over the range, the Mt. Diablo was well spoken of as having in the past paid largely, bnt, for some reason, at present little work is there heing done. The want of water in the region, for milling purposes, is the great embarrassment, for which there seems to be no remedy at preeent known. The mill at Marietta, 14 miles west of Bellville, is supplied with water hy wells, and here in the valley there is enough for any numher of other mills. But the expense of hauling the ore this distance is necessarily great. Possibly a narrow-guage railroad could, in an important manner, remedy this.

From Marietta west another vacancy in mining occurs, of about 50 miles, to Aurora, though by a hee line, through lofty, desolate, irregular mountains, the distance might he less than 40. This town is an old, well known mining locality, too well known to require an extended account. Ten or fifteen millions of dollare, it is said, have been taken, mostly from near the surface, at this place, hut the leads, on being worked downwards, were of a natnre to discourage the owners, hence mining, to a large extent, was given up. But of late, one prominent claim, the Real Del Monte has heen taken hold of in earnest, hy those interested, and a ehaft is heing put down, with a pumping apparatus and hoisting works, the most powerful in the State, the company heing determined to test the claim thoroughly and know what there is below. Till this is done all other mining claimants eeem to suspend operations, watching the Del Norte developments, hoping for the best and doing nothing till they know. But, from all which we could see and learn of the condition of things in this once famous locality, we do expect that Aurora will experience a revival of miuing activity more extensive aud more remunerative than ever it has yet known.

S. V. B.

Poisoned Water.

EDITORS PRESS:—In yonr iesue of September 13th Mr. E. W. Hilgard makes many plain etatemente which I believe to be true. I have resided in California eighteen mouths, and have been eurprised at the quantity of "galvanized" pipe used for water. Some eight years ago the matter was fully discussed in Boston and New England papers, and the pipe condemned as unfit for use. The Boston *Journal of Chemistry*, after fnll investigation, warned the people against its use for conveyance of water, and my impression is that hut small quantity of such pipe is now used in the Eastern Statee.

I think *all waters* act npon zinc, and in no case is it safe to drink water after it has passed through "galvanized" pipe. I have known of one death, and many cases of sickness where the cause was traced directly to the use of water through "galvanized" pipe.

While visiting the Deaf and Dumb Institution at Berkeley I called attention to the large amount of "galvanized" pipe in use for conveyance of water in that institution. I sent to Boston for papers giving the analysis of water through "galvanized" pipe; also, the action of a town near Boston in regard to "galvanized" pipe. I am told the matter was suhmitted to the State assayer for inveetigation.

Some of the symptoms of zinc poison: Pains over and about the eyes, soreness in the pit of stomach, weakness of knees, numhness of hands aud feet.

W. P. S.

Volcano, Amador Co.

MONTANA, during the past 16 years, has produced $153,000,000 worth of gold and silver. Of this eum $147,000,000 was in gold. There are already 20,000 quartz claims in the Territory. Iron and lead mines have been opened, and coal is plentiful.

INCREASED activity in gold mining is reported from Nova Scotia. The total yield of gold in Nova Scotia from its discovery to the firet of the present year has been 283,570 ounces, 16 dwt. and 15 grains, and the quartz crushed 376,212 tons.

Alaska and Its People.

In a relation of personal ohssrvetions on Alaska hy Archhishop Seghers and his party, the Yukon river is descrihed as a magnificent stream. Taking the Amazon as the first and the Mississippi as the second of American rivers, the Yukon is the third in size. At the point where the Bishop's party reeched it, soms hundreds of miles from its mouth, the Yukon is three miles in width, and studded with islands as fer as the eye can reach. An idea of its volume of water can he gathered from the fact that out in the open sea, eix miles from the mouth of the river, the water taken from its stream is still fresh enough to drink. The length of the Yukon is over 3,000 miles, and it is navigahle for steamere of considerable eize for over 2,500 miles of its course. Further up, where the Yukon receives a large trihutary, the Porcupine, the basin formed at the confluence of the two rivers, is 24 miles in width.

The Yukon was reached after a four-days' march due east from Norton's sound, across a country which is one continuone marsh, save only the low hills now and then encountered. Mosquitoes "literally blackened the sky." Grouse were found in abundance, and it was chiefly upon their flesh that the party suhsisted.

Navigation on the Yukon ie carried on by means of a *bidara*, a sailing vessel consisting of a light frame-work of wood, covered by skins of the hair seal.

The party arrived at Nulato about the end of July. The language is a oorruption of some Russian dialect, and consists of only a few hundred words. It is so simple, so undeveloped that the same word, accompanied though by a different gesture of the hand in each instance, is made to do service for the past, preseut and future tenses of the verh.

The first ice made its appearance in the beginning of September. On the 10th of Octoher the river froze over, or rather hlocked up, great cakes and fields of ice drifting down stream with the rapid current, forming a gorge at at some narrow point, then heaping up and piling over one another until the river from hank to hank was filled with ridges and diminntive mountain chains of ice. As winter advancee the water falls, allowing the ice bridge to hang suspended until it hreaks through its own weight, and comes down with a tremendous crash. Later in winter the Bishop started to visit the Cioquoh Indians. Here it may be mentioned that traveling in the interior of Alaska is always at the extrcme peril of the venturesome explorer, the Indians who are continually at war, treating all strangers with strict impartiality when once they take to the war path. This journey to the Cioquohs was undertaken in dog-sleds, a style of traveling not without its disadvantages, one of which is occasioned by the dogs striking a game trail, and following it up on the full run regardless of the load behind, which is scattered in every direction. The ordinary load of a dog-sled ie 500 pounds. The driver usually keepe up with his team by joggling along at a dog trot, hut sometimes he treats himself to a ride. A good dog-driver can easily run 70 miles a day, one day with another—a feat to match our Westons and O'Learys. A team is made up of seven or nine dogs, alwaye an uneven number, one taking the lead, the others harnessed in paire. The dress worn on such expeditions is a deer-skin coat with Capuchin hood to draw over the head, fur cap, deer-skin trousers and boots. The deer-skin, dressed only enough to make it pliahle, is worn with the hair outside. While among the Cioquohs the travclers put up quite frequently in the *barabara*, or native hut, whose construction may he understood from the following description: On entering the *barabara* the visitor firet descende a shallow pit, from the hottom of which a tunnel eight feet long conducts him to the subterranean portion of the dwelling. The hut is circular, and is sunk into the ground about five feet. The portion above the level of the gronnd is huilt of mud and is of conical form. Only one opeuing is provided, and this is in the apex, where it givee escape to the smoke. At night this opening is closely covered with seal-skin, and the tunnel tightly closed, so that all access to the cold, and to the air as well, is cut off. In thie manner the *barabara* is made very warm, but exceedingly unwholesome. Where a hut of thie description was not met with at nightfall, the travelers dug a square hole in the snow, huilt a rampart of hranches toward the northern side, from which the wind nearly always hlows, and sought repose on a couch of boughs thickly laid on the bottom of the hole. Exposed thus to Arctic cold in the open air, tea is the only beverage used by the Northerner. Strong spirits create a greater amouut of heat in the system, but the reaction following leaves the travcler more thau ever exposed to danger of death from freezing. While among those people, the Bishop also formed the acquaintance of a Medicine Man, who undertook by his incantations to cure a sick child in the house where the Bishop's party were guests. Part of the performance consisted in pounding a gong with a cluh, and when the Bishop learned that thie ceremony was to he continued all night, it need not surprise us that even the proverhial patience of the missionary hecame exhausted, and that *vi et armis* the Alaskan M. D. was forthwith deprived of his professional paraphernalia.

Returning to Nutalo, the party started down the river hy sledge, experiencing such a degres of cold that 60° helow zero was frequently registered hy the spirit thermometer. On the trip the Bishop witnessed a religious ceremony which seemed to mean the worship of fire if it meant anything; and that half-frozen wretches should at length taks to the aderation of firs as their salvation from the Polar cold is not very strenge. Those Indiens are adepts in making earthenware, soms of their utensils heing of a capacity to hold several gallons, and representing a very considerehle advance in the potter's art. They differ from the southern Indians of the Pacific coast in their manner of disposing of their dead, which are huried, not hurned, as among the Piutes, Washoes or Diggers. They resemhle the whites in having a taste for ornamenting the graves of their departed warriors; hut one epitaph found hy the Bishop was not calculated to stir very profound depths of woe. It had probahly heen picked up at some trader's camp and devoted to use as an epitaph, the finder evidently helieving it to possess virtues not of this world. Fastened to a pole and placed at the head of a departed warrior, it gave "Bee hive Breakfast Bacon" as its recital of the virtues possessed by the deceased. But perhape the most interesting fact mentioned by the reverend lecturer is the astonishing proficiency in music acquired hy those savages. So far advanced are they that their arias can easily be committed to writing by our syetem of musical notation. Three or four of these songs were rendered word and note by his Grace, who has a fine baritone voice. In one, a warrior's funeral dirge, a mingling of grief with enlogy of martial prowess *must* have heen the meaning of the words, so clearly did the air express those comhined feelings. The lecturer also gave specimens of Alaskan dancing, which it appears ie done principally by the women, under the eyes of their admiring lords. The dance ie highly and euperlatively "proper," consisting as it does of a leaning posture in which the dancer stands on one foot while she ponnds the floor with the heel of the other, the toe not being moved from the floor Even the most etraight laced could have nothing to say against such "steps."

On the Aleutian island the winters are not very severe. The euow falls very deep, about 24 or 25 feet every winter. This depth is of packed snow, through which the people of the villages cut passages from one house to the other. The principal occupation of the inhahitants is eeal fishing in the employ of the Northwestern Fur Co. Seals abound in enormoue numbers. On St. Paul island their estimated numher is 11,000,000; on St. Michael island, 5,000,000 or 6,000,000; an enumeration heing an easy matter since they are not at all shy.

Texas.

The old mining districts on the San Saha river in Menard county, which were opened up and developed over a century ago by the Spaniards, are now again ohtaining notoriety through the settlement of several counties iu the mineral region, and it is believed that the capital which is now being intereeted in reopening and developing the old mines and prospecting new ones, will soon hring Texas prominently to the front as a mineral producer, as in ancient times these mines were epoken of ae the richest and most productive belonging to the Spanish crown. We learn from a gentleman largely interested in the development of these mineral resources that since the settlement of Mason, McCulloch, San Saha, and Llano connties, which has but recently occnrred, a great many prospect holes have heen made, and the most promising "showe" are now to be seen there. Especially is this so in Mason and Llano counties. The veins are well defined and many of them of great length; the gangue generally being of gray copper, peacock, red and hlue and green carhonates, oxide of copper, with copper pyrite and yellow iron pyrite, nearly all of which carry from 3 to 60 ouncee silver, ¾ to 5 ounces gold, and 40 to 80 of copper. The green and hlue carhonates are valuable for the copper alone—55% to 70%. One or two shafts have been sunk by private enterprise, showing a continuation of the veins aud an increased value of vein matter. One shaft in Mason county, at 102 feet in depth, shows a vein 22 inches wide, filled with the ores before mentioned; this vein increased in width at the rate of one inch per foot as far as it was followed, with hard quartzite walls. It is one of a group of five, and possihly six, which promise well, and run parallel to each other, only a few yards apart. It is helieved hy experts that these veins at no very great depth will become one; at all events, they could each be worked from one opening on the surface. These minee are ahout 100 miles from a railroad depot, are surrounded hy a superabundance of mountain post-oak, which makes an excellent smelting coal, and can be burned at less than 10 cents per hushel. Roade are hard, winter and eummer, and the mines can be worked every day in the year. The State of Texas came into the Union by annexation, and retained the control and ownership of her vast public domain; hence there are no mining laws of the United States which apply to the mines within her borders. The lands are ceded by letters patent to individuals, giving ahsolute ownership to the mines, etc., npon them. For this reason prospectors have heen kept out of the country, the owners of land having upon them "shows" preferring to hold them for speculation or sale at large figures.—*Investors' and Mining Journal.*

MECHANICAL PROGRESS.

Measuring Velocity of Light.

Albert A. Michelson gave before the American Association for the Advancement of Science at Saratoga, the following description of his apparatus for measuring the velocity of light. A beam of light is allowed to fall through a slit upon a rapidly rotating mirror, from which it is reflected upon a lens of great focal length, throwing the beam upon a plane mirror placed at right angles to its axis. Now, the image of the slit in this plane mirror will again act as an object which will be reflected upon the rotating mirror. While the light has traveled from the rotating mirror through the lens to the plane mirror and back again, the rotating mirror will have changed its position so that the returning image of the slit will not be reflected to the place from which it came, but will move from it. When the rotation of the mirror becomes sufficiently rapid, then the flashes of light will produce a stationary image, which is deflected in the direction of the rotation, and through twice the angular distance, described by the mirror during the time required for the light to travel twice the distance between the mirrors. By accurately measuring the deflection, the distance between the mirrors and the number of revolutions made by the revolving mirror, all the elements necessary for the determination of the velocity of light would be given. An important point was to insure regularity in the rotation of the mirror, and this Mr. Michelson achieved with the aid of the apparatus devised by him. The revolving mirror was set in motion by a blast of air passing through a regulator, and acting upon a species of turbine wheel attached to the axis of the mirror. The supply was varied by a valve.

To regulate and measure the speed of rotation, a tuning fork, bearing on one prong a steel mirror, was employed. This was kept in vibration by a current of electricity from five gravity cells. The fork was so placed that the light from the revolving mirror was reflected to the piece of plane glass in the eyepiece, thence reflected into the eye. When fork and revolving mirror are both at rest, the eye sees an image of the revolving mirror. When the fork vibrates, this image is drawn out into a band of light. When the mirror commences to revolve, this band breaks up into a number of moving images of the mirror; and when, finally, the mirror makes as many turns as the fork makes vibrations, these images are reduced to one, which is stationary. This is also the case when the number of turns is a sub-multiple. When it is a multiple, or a simple ratio, the only difference is that there will be more than one image. The electric fork made about 128 vibrations per second. No dependence was placed upon this rate, however, but at each set of observations it is compared with a standard Ut3 fork, the temperature being noted at the same time. In making the comparisons the beats were counted for 60 seconds.

The apparatus for measuring the deflection consisted of a screw with divided circle, on which a carriage supporting the eyepiece traveled. The deflection was read on a scale and the circle of the screw. The distance between the revolving and the plane mirror, measured with steel tape and corrected, was found by the mean of several observations to be 1986.35 meters. The rate of vibration of the standard fork was 256.070 vibrations per second at 65° F. From these data Mr. Michelson found the velocity of light, from an average of 100 determinations, to be in vacuo 299,828 kilometers per second, or taking one kilometer at 3280.87 feet, 186,298.5 miles.

New Rotary Engine.—A French inventor, Claude Jobert, has lately conceived the idea of combining the actions of the Woolf engine so as to obtain therefrom a direct rotary motion without the intervention of a connecting rod, and which should have no dead-point. The Woolf engine, as is well known, consists of two cylinders—a small and a large one. The first of these receives steam at full boiler pressure, the second allowing the same volume of steam to expand after it has done its work in the first cylinder; or else it is composed of a small cylinder, placed between two larger ones, in which latter the expansion of the steam takes place. Mr. Jobert's improvement is designed not only to avoid the numerous escapes of steam which occur in the rotary engines at present in use, but also to utilize the expanded steam. For this purpose he has placed the smaller cylinder within the piston of the large cylinder and at right angles to the latter. By this means a quadrangular motion is produced, which communicates a direct circular movement to the shaft, not by the suppression of the rectilinear motion, but by a combination at right angles of the two rectilinear motions. In the center of the piston of the large cylinder is another and smaller piston, which works vertically within it. These two pistons are crossed transversely by a cranked shaft. The result of this combined movement of the two pistons is, that a dead-point only occurs in one cylinder at a time, and at that moment the action of each of the pistons is supplemented by that of the other, since they both act together on the same crank. They thus communicate a uniform circular motion, without any dead-point, and without any intermediate connections. This engine is capable of working either with or without expansion and in either direction.—*Universal Engineer.*

Rectangular Boring Machine.—At one of the recent meetings of the Franklin Institute, Dr. Robert Grimshaw exhibited a sample of the work done by J. Hall's rectangular hole-boring machine. As this mechanical paradox attracted considerable attention at the Paris exhibition, the readers of the Press will be interested in a brief explanation of it. The drill has for section an equilateral triangle. The tool-holder of a special shape, having a screw at the upper portion, then a rectangular section; then a round section of a given diameter; then another section of the same shape, but of greater diameter. There is a hollow rectangular sleeve, somewhat larger and narrower than the rectangular section. A slight horizontal and vertical movement can be thus obtained. This sleeve varies in size and amount of play according to the work to be done. When the tool is in position it is guided by a steel plate, which has a hole corresponding to the one we wish to bore. In turning, the tool occupies various positions, the cutting portion following the exterior contour of the rectangular guiding plate. If a pressure is exerted upon the tool, the boring will commence producing, as desired, a rectangular hole. If any portion of the tool be considered during its rotation, it will be found that the loci of the same represent most interesting curves of the third and fourth orders.

Reversal of Motion Without Gears or Belts.—In 1853 MM. Claparade, Roux and Delille attempted to produce opposite revolutions in two parallel arbors by means of a Watts parallelogram, but these experiments were not satisfactory. Charles Bourdon has lately introduced a contrivance which is based upon the two following theorems: 1. If two cranks, of any length and initial position, turn with the same angular velocity, the point which divides the line of variable length, which joins their extremities at each instant, describes a straight line parallel to the bisectrix of the angle of the two cranks. 2. When the two cranks are equal, the projection of the joining line on the bisectrix preserves a constant length. By means of an ordinary slide, M. Bourdon compels the middle of the system to take a rectilinear movement. Then, by means of two reciprocating Peaucellier cells, or even without the use of cells, if one extremity of the crank is allowed a slight play, two arbors may be easily connected so as to turn in opposite directions and to avoid any dead point.—*Bull. de la Sec. de l'Enceur.*

A Remarkable Repeating Rifle.—An invention has been patented by one of the late chief mechanicians of the small arm manufactory at Steyer, in Upper Austria, which is attracting much attention in Austria and Germany, since, should its practical application prove feasible, it will add very greatly to the power of musketry fire. The invention consists of an apparatus, described as very simple in design and construction, by which an ordinary breech-loading rifle can, whenever it may be desired, be temporarily converted into a repeating arm. The apparatus holds 10 cartridges, and can be carried by the soldier in his pocket. When necessary it can be fitted on the rifle in a moment, when the 10 rounds can be fired just as rapidly as the same number of cartridges can be discharged from any magazine rifle. The inventor has submitted his apparatus, which has been recently materially simplified and improved by Werndl, the well-known small arm manufacturer to the Imperial War Ministry, and a series of experiments are, it is stated, to be shortly carried out with it.

Mineral Prospecting and Rapid Boring. The Cumberland Diamond Boring Company have been at work since the latter part of last year in the neighborhood of Drongan, Ayrshire, putting down boreholes to prove the coal field of that district for Messrs. J. Galloway & Sons, of Kilmarnock. Holes 1,254 feet and 832 feet deep have been completed, and satisfactory samples of the strata obtained not only from the rocks, but also from the coal seams passed through. In the whinstone, as much as 15 feet per day of six-inch hole was bored, whereas, in the ordinary way, it is difficult to bore a 2½-inch hole at a greater speed than 6 inches per day. The value of this system of boring is not generally known, as not only is a rapid speed obtained, but always reliable section of the rocks and good solid samples of the coal. We understand this company is now boring for the Shotts Iron Company, near Roslin, and are largely employed in boring wells for water supplies as well as prospecting for minerals.

Leaf-turning Machine.—Herr Carl Taense, of Berlin, has invented improvements in machinery for turning over the leaves of music. They consist of several arms, each fastened to and actuated by a spring fixed in a case, to which also is affixed a drag-spring for giving power to turn over the arms, which are furnished with guides or pieces. Each arm and its guide is applied to and embraces a sheet of music or the leaf of a book. At the bottom of the apparatus is a finger-plate or ledge, which is connected by one or more levers to the spring cases and certain ratch or catch-pins, so that when the finger-plate is pressed the spring is released and turns over an arm with its leaf, and so on. Instead of a finger-plate a pedal-plate may be used by a slight alteration of the operating levers. The various parts may be of metal or wood, or of both combined.

SCIENTIFIC PROGRESS.

Ornamenting Glass with Metals.—Parties in France have invented and patented a new process for ornamenting glass with metals. For the golden bronzing of glass, instead of using, as at present, the air or vapor by which glass is now blown in molding or shaping it by hand. They employ a suitable reducing gas, such as pure hydrogen gas or coal gas, for the purpose of reducing metallic oxides or salts added in the composition of the glass, and thereby metallizing the interior surface of the glass. This may be done of all shades or colors, according to the composition of the glass. The oxides may be any of those generally used in glass working, for instance, oxides of copper, which, when reduced as above mentioned impart a golden or bronzed aspect to the glass. This metallizing process may be applied not only in the manufacture of all kinds of articles of glass or crystal, but also to stained window glass, glass plaques, or tiles for mural or other decoration, reflectors, lighthouse lenses, and glass used in lighting apparatus generally. The most attractive article to which they are turning their attention is the Corinthian china metallique, which is produced by enclosing a layer of gold or other leaf between two layers of glass, subsequently expanding the glass so as to break up the metal into infinitesimal fragments, the result being a kind of aventurino glass, resembling the spangled enamele found at Corinth.

Combustible Dust.—There are many combustible dusts, which are very dangerous. Zinc dust is imported in considerable quantities for use in certain branches of industry. It is a gray powder, and extremely fine. Great care should be taken to keep moisture away from it, for when moisture comes in contact with it it will readily oxidize—a process which is attended by a great rise in temperature—and the hydrogen gas which is liberated may take fire. This has often been the true cause of apparently mysterious ship and factory fires. Dry coal dust in mines will readily explode when ignited. These sources of disaster are not properly guarded against in America. It would be difficult to free mills and factories from the dusts that are constantly generated inside them. But they might be ventilated by strong air currents to carry off all the dust. Keep workmen from lighting their pipes and keep lamps and gas-lights out of the building. A match, a lantern, sparks produced by friction, any source of fire may produce a disastrous explosion.

Spectroscopic Detection of Ergot in Flour.—The following method of detecting the presence of ergot in meal by spectroscopic analysis has been devised and practiced with success by M. J. Petri. He boils about 20 grammes of the suspected meal several times successively in alcohol, pouring off the spirit after each operation till it has lost all yellow tinge and comes away perfectly colorless. About 20 drops of dilute sulphuric acid are added to the exhausted meal, which is then well stirred up and thrown on a filter. The filtrate will now assume a red color if ergot be present, owing to the fact that this latter contains an easily soluble red coloring matter, which it readily yields in alcohol or ether. When examined in the spectral apparatus, the filtrate, even in an extremely weak solution, shows two well-defined absorption bands, one of which lies in the green between E and F, and the other in the blue between F and G. M. Petri is now engaged in an attempt to find a method of quantitatively determining the ergot by the intensity of the red color in the filtrate.

New Theory of Terrestrial Magnetism.—Professors Perry and Ayrton have proposed the theory that the revolution of the earth beneath the electrical charge originally and at all times present in the atmosphere may and is sufficient to account for the magnetism of the earth. They have submitted the matter to calculation, and find that the difference of potential between the earth and space necessary to produce a distribution sufficient to produce the observed magnetic effect can be represented by 54,000,000 Daniell cells. They prove, according to this theory, that "if the earth be electrified, it must, from its very rotation, quite independently of all other bodies in the universe, be magnetic; and if it consist of a shell of iron, thick or thin, then that the law of distribution of magnetism produced by this electrical charge in mechanical rotation, will be identically that given by Biot; and, lastly, if the earth were wholly of iron, a difference of potentials of about 54,000,000 volts between it and space would be sufficient to produce the necessary amount of charge.—*Phil. Mag.*

Lacustrine Relic.—M. Morel Fatro, who is conducting some extensive explorations at the lacustrine station of Corcelettes, Canton Vaud, announces the discovery of a large canoe in an excellent state of preservation. It is formed of a single pine log 32 feet long and 2¾ feet wide; and though the stern is slightly damaged, the bow, which is carved and ornamented, is perfect. This interesting find will be placed in the museum of Lausanne, which now contains the richest collection of lacustrine relics in Europe.

Occlusion of Hydrogen by Copper.—Johnson has re-examined the result deduced by him from his earlier experiments, that metallic copper occluded an amount of hydrogen which might cause serious error in organic analysis; this result having been questioned by Thudichum. The copper to be tested was oxidized at the blowpipe, reduced in hydrogen, allowed to cool in that gas, the H displaced from the tube by dry air, the metal re-oxidized in a current of dry air, the water produced being collected in a weighed tube containing pumice moistened with sulphuric acid, special precautions being taken to exclude extraneous moisture. It was found that this occlusion actually took place, and that the pulverulent metal formed from the oxide reduced on the surface of the copper was most active, the amount occluded diminishing progressively as the metallic powder becomes denser by successive heating. A carefully conducted experiment showed the occlusion of 0.035 gram of hydrogen by 100 grams of copper. But curiously enough, it appeared that the finest precipitated copper oxide yields a finely divided metal on reduction, which does not occlude hydrogen. Moreover, the author found that the copper thus hydrogenized, reduced potassium chlorate to chloride. Heating alone in a vacuum does not set free the gas. The author therefore concludes that it is unsafe to employ copper freshly reduced in hydrogen for the reduction of oxides of nitrogen in organic analysis unless the metal be previously ignited in nitrogen gas.—*J. Chem. Soc.*

Glass Wicks for Lamps.—Messrs. Voubriel and Beck, of Hanau, have invented a patent form of lamp wick, made entirely of glass, the use of which they claim to be attended with very considerable advantages. It is chiefly intended for petroleum and spirit lamps. A series of experiments have been made with it at the instance of the *Technisches Organ fur Gewerbe und Haushaultung*, and the report given in its columns is decidedly favorable. The flame clings closely to the wick, so that lighted lamps may be carried about without fear of their being extinguished by sudden drafts; moreover, no sparks are liberated from it. With an equal amount of this wick turned up, a much brighter and clearer light is obtained than where cotton ones are used. The smoking is greatly reduced, and at least 10% of oil is saved. There is scarcely any waste of the wick itself, and the troublesome trimming and cutting to which lamp burners are accustomed, is altogether needless, for no portion of it is carbonized. Used in spirit lamps it greatly increases the heat of the flame, and finally it can be produced and sold at a very cheap rate.

Change of Volume in Iron.—At the recent meeting of the British Association at Sheffield, Mr. T. Wrightson read some observations on the changes of volume in iron when passing from the liquid to the solid state. He argued against the prevalent idea that cast-iron when cold would float in its own fluid and declared it a fallacy. Cast-iron spheres of various sizes, lowered into a ladle of molten iron invariably went below the metal for a few seconds, then rose to the surface, and continued rising gradually until their maximum expansion had been reached. This rapid rising to the surface was the result of an expansion in the ball when heated by contact with the fluid metal. It is customary to assume when the iron was observed to sink that the velocity of its fall carried it down, neglecting the fact that the volume of the ball, and therefore its conditions of flotation had been altered by the heat during the time of its immersion.

Tempered Glass.—According to the *Glashuette*, tempered glass, though it has fallen into discredit in Germany, is in growing demand in France and Holland, as is proved by the establishment of new works and the improvements in the process. At Choisy-le-Roy the glass is tempered in a bath of margarine (a by-product of the artificial butter manufacture). At other establishments saline baths are in use. The bursting of tempered glasses may be due either to the original mixture having been melted at too low a temperature, or to the fact that the heat of the tempering bath is not duly proportioned to the weight and thickness of the articles.

Colored Photographs.—M. Cros preparee three photographic impressions of any object by sifting the light through solutions which will respectively arrest the green arrays, the yellow rays, and the violet rays. The impression from which the green has been excluded, if developed under green light, will appear intensely green at points where the original was the greenest, and pale green or black at the green points where the green was mingled with other colors or was entirely absent. By combining the three negatives, and superposing the images by the help of reflecting prisms, he obtains an approximate solution of the fixation of colors by photography.—*La Nature.*

New Means of Illumination.—The applications of phosphorescence are not confined to the illuminated dials of watches, nor even to phosphorescent paint. It seems it may be applied to the illumination of a room. At the late exposition at the Palais d' Industrie, at Paris, a dark room was prepared with phosphorescent window panes, which afforded a tolerable light, doing away with the necessity of any other light.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Sept. 4.		Week Ending Sept. 11		Week Ending Sept. 18		Week Ending Sept. 25	
Alpha	25½	23⅞	27½	24	29	19¾	20½	17½
Alta	6⅝	5⅝	6⅝	6	6⅞	6⅛	6⅝	6
Andes	1	90c	1	90c	1.05	1	1.60	1.05
Alps	....	....	....	....	....	....	....	....
Argenta	80c	75c	80c	75c	75c	70c	1.10	75c
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	20c	....	....	....	20c	....	20c	....
Baltimore Con	50c	....	50c	....	60c	50c	....	....
Belcher	4.65	4½	4⅝	4.55	4⅝	4.40	4.60	4½
Belmont	85c	65c	80c	65c	55c	....	60c	....
Best & Belcher	18⅞	18	19½	18	18⅝	17½	19⅝	17⅜
Bullion	8½	7½	8⅝	7⅝	8⅝	7⅝	8	7½
Bechtel	1.30	1½	1.30	....	1.45	1.20	1½	1.40
Belle Isle	4.45	4.30	3.90	3.55	4.45	4.15	5⅝	4⅝
Bodie	10⅝	10	10⅞	10½	14½	11	14½	13½
Benton	3.90	3½	4.10	3.80	4	3.60	3⅞	3⅜
Bulwer	9	8⅝	9½	8⅞	10½	8⅞	12½	11½
Boyle	....	....	....	....	....	....	....	....
Black Hawk	1.05	1	1.05	75c	1	85c	1	80c
Belvidere	75c	....	1	80c	1	80c	90c	80c
Booker	1.20	1	1.20	1.05	1.35	1.05	1½	1.05
Caledonia	1.95	1.85	2½	1.85	2.10	1.70	2½	1⅞
California	4.95	4.80	4.95	4½	5	4.65	6½	5½
Challenge	2.40	2	2½	2⅞	2.60	2.25	2.30	....
hollar	7	6½	7⅞	6½	7⅞	6⅝	7½	6⅞
Confidence	11	10½	11½	10⅞	11½	10	10⅞	10½
Oon Imperial	1.70	1.45	2.05	1⅝	2	1.30	1½	1.45
Oon Virginia	4.85	4⅜	4.90	4⅝	4.95	4⅝	6½	5½
Crown Point	5.80	3.70	3.90	3.70	3.95	3.70	3.70	3½
Con Wsshoe	....	....	....	....	....	....	....	....
Champion	45c	40c	40c	30c	30c	25c	30c	20c
Concordia	10c	5c	10c	5c	....	....	5c	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	10c	....	20c	15c	50c	20c	60c	45c
Eureka Con	16⅞	16	16⅞	16½	29	17½	25½	21
Exchequer	6⅞	6½	7⅞	6⅝	7⅞	5⅞	6⅝	5⅞
Endowment	50c	45c	30c	....	35c	30c	50c	40c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	3.55	2⅞	2⅞	2½	2.90	2½	2½	2
Gila	55c	50c	60c	55c	50c	40c	35c	30c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	....	....	12	....	8	....	....	....
Goodshaw	50c	40c	50c	35c	40c	....	35c	25c
Gould & Curry	12	11½	12⅞	11⅝	12½	11½	12	11½
Hale & Norcross	14⅞	14	15	14½	14⅝	13⅝	14½	13½
Hillside	1.60	1½	1.85	1.65	2	1.80	2	1.85
Highbridge	5c	....	....	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	5c	....	10c	5c	5c	....	5c	....
Independence	2.15	2.10	2.20	2.05	2.15	2.05	2.10	1.80
Julia	4.40	4.15	4.90	4.15	4⅝	4.20	4.55	4.10
Justice	3	2.60	4½	2⅞	4½	3½	4	3.55
Jackson	....	....	4	....	....	....	4½	4
Joe Scates	....	....	....	....	....	....	....	....
K K Con	1	....	2	1⅞	....	....	....	....
Kentuck	4½	4	4½	4	4.40	4.20	4½	4½
Kossuth	20c	....	20c	....	10c	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	60c	55c	60c	50c	55c	40c	1.10	45c
Lady Wash	1.20	1.05	1.30	55c	1½	1	1.20	1
Leopard	40c	30c	35c	25c	25c	20c	60c	10c
Leviathan	30c	25c	55c	25c	60c	50c	60c	50c
Leeds	70c	65c	70c	....	50c	....	75c	....
Lee	....	....	....	....	....	....	....	....
May Belle	25c	....	....	....	25c	....	25c	....
Modoc	1½	1	....	....	....	....	1½	1
Manhattan	3	2⅞	3½	3	3.40	2⅞	3½	....
Martin White	2.20	2	2.10	1.20	1.80	1½	3½	2
McClinton	1	70c	75c	65c	60c	55c	80c	50c
Meadow Valley	....	....	....	....	....	....	50c	....
Mexican	35	33½	37	33	38⅞	36½	38⅞	37
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	....	....
North Con Virginia	8	7⅞	8	7½	8	....	8⅞	8½
New York	90c	55c	70c	60c	70c	60c	65c	60c
Northern Belle	3⅞	3½	4	4⅞	4	3½	4	3⅞
New Coso	....	....	....	....	....	....	....	....
Navajo	30c	25c	30c	25c	50c	30c	40c	30c
Occidental	1	75c	1.65	90c	2.05	1.70	5½	2.60
Ophir	36⅞	35⅞	38½	35	42½	39½	44	42
Oriental	40c	30c	50c	25c	45c	10c	20c	15c
Overman	9	8⅞	10	8⅞	10	8½	9½	9
Panther	....	....	....	....	....	....	....	....
Phenix	1½	....	2½	....	3	2½	....	....
Phil Sheridan	40c	....	....	....	50c	30c	40c	....
Potosi	5½	4.85	6½	5½	6½	5½	6	5⅝
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	75	65c	75c	65c	75c	65c	1½	95c
Richer	40c	15c	30c	25c	40c	25c	....	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	15	14½	15⅞	14½	15	13⅝	14⅞	13⅞
Seg Belcher	24	23½	23	22½	23	20	24	22
Sierra Nevada	43⅞	41½	47½	41	48	45	48⅞	46⅞
Silver Hill	1.60	1½	2	1.60	1.80	1.60	1.65	1.40
Silver King	....	....	4½	....	....	....	4⅞	4½
Silver Prize	15c	10c	10c	....	....	....	....	....
Succor	15c	10c	10c	5c	10c	5c	5c	....
Summit	1.70	1½	1½	1½	1.70	1½	2	1½
Scorpion	2.70	2⅞	3	2½	3	2.80	4	2.95
Solid Silver	....	....	....	....	25c	....	65c	25c
South Bodie	30c	....	35c	30c	30c	20c	30c	25c
South Standard	5c	....	10c	....	10c	5c	5c	....
Star	45c	40c	40c	....	50c	45c	80c	70c
St. Louis	....	....	40c	....	....	....	40c	....
Syndieate	6⅝	5⅞	6	5⅞	6	5½	5⅞	5½
Tioga Con	3.55	3.45	3.60	2.95	3	2⅞	3.70	3
Tiptop	90c	75c	1	90c	85c	80c	1.05	1
Trojan	30c	25c	40c	25c	40c	35c	25c	20c
Union Oon	62½	55½	73½	59	75½	69½	74	70½
Utah	19	18	21	18⅞	20½	18½	20⅞	19½
Vermont Con	....	....	....	....	....	....	....	....
Ward	2	1.85	2.95	1.95	2.60	2.35	3.10	30c
Wells-Fargo	....	....	10c	5c	10c	5c	10c	....
Woodville	40c	35c	45c	35c	45c	35c	40c	35c
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	17	15⅞	18	16½	18	16½	16⅞	16½

Sales at S. F. Stock Exchange.

Friday A. M., Sept. 19.

400 Andes 1.05@1.10
140 Alta 6⅞@6½
605 Alpha 20@20½
875 Belcher 4½@4.60
305 Benton 3.70@3⅞
735 Bullion 7⅞@8
170 Best & Belcher 17⅞@18
480 California 5½@5½
645 Con Virginia 5½@5⅞
20 Challenge 2.35
90 Chollar 7½
400 Caledonia 1.85@1⅞
310 Crown Point 3.70
3065 Oon Imperial 1.45@1½
380 O Dorado 1.70@1.80
365 Exchequer 6⅞@6½
350 Flowery 65c
330 Gould & Curry 11⅞
150 Golden Gate 3
150 Hale & Nor 14½@14½
300 Julia 4½@4.55
165 Justice 4@3.95
30 Kentuck 4.30
2460 Lady Bryan 45@50c
500 Leviathan 50c
590 Lady Wash 1.10
1400 Mackey 1.20@1½
60 Mt View 2.60
595 Mexican 38@37⅞
150 New York 60@65c
320 N Bonanza 1.65
360 Ophir 42½@42½
45 Overman 9½@9
250 Occidental 2.60
735 Potosi 5⅞@6
50 Silver Hill 1.60
635 Scorpion 3@2.95
115 Savage 14⅞
550 Sierra Nevada 47@46⅞
250 Succor 5c
500 Trojan 20@25c
486 Union Oon 72@73½
115 Utah 19⅞@20
650 Wells-Fargo 10c
290 Ward 2.55
60 Yellow Jacket 16⅞@16⅞

AFTERNOON SESSION.

50 Adenda 50c
1130 Argenta 75@80c
100 Albion 20c
220 Boston 1.30
525 Bodie 14@14½
290 Bechtel 1.45
650 Belle Isle 4⅞@4.85
225 Booker 1.10@1.05
50 Belvidere 90c
515 Bulwer 11½@12½
575 Black Hawk 1
250 Champion 20@25c
400 Concordia 5c
100 Caledonia (B H) 2⅞
345 C Pacific 6½@7
100 Dudley 1.10
1170 Day 45@50c
120 Eureka Con 25@25½
200 Giant & O A 5½
355 Grand Prize 2½@2
275 Gila 35c
100 Goodshaw 30c
785 Hillside 1.85@2
335 Independence 2.05@2.10
340 Jupiter 1⅞
460 Leopard 10@15c
150 May Belle 25c
50 Mammoth 9
100 McClinton 50c
300 Metallic 45c
1015 Martin White 2½@2½
430 Mono 7½
330 Northern Belle 3⅞
850 N Belle Is 40@35c
1000 Navajo 40@30c
45 Noonday 3
1000 Orient 25c
650 Paradise 2.05@2
1270 Ray'd & Ely 95c
130 Syndicate 5⅞
100 S Standard 5c
100 Summit 1½
640 S Bulwer 60@65c
700 Tioga Oon 3½
675 University 16c

Saturday A.M., Sept. 20.

100 Aurora 20c
240 Alpha 18½@18½
255 Andes 1.30@1½
170 Argenta 80@75c
260 Alta 6½
100 Albion 20c
310 Belcher 4½@4.55
520 Bullion 7⅞@7½
120 Benton 3.65
235 Best & Belcher 19@19½
1160 Belle Isle 4.80@4.90
1000 Big Prize 45c
245 Bodie 13⅞@14
760 Bulwer 12½
100 Bechtel 1½
200 Belvidere 90c
125 Black Hawk 1
50 Booker 1.10
270 Boston 1.30@1½
265 Crown Point 3.60@3.55
2100 Oon Imperial 1.30
480 Caledonia 1.80
200 Con Dorado 1⅞
1555 California 6½@6½
540 Con Virginia 6⅜@6½
10 Chollar 7½
100 C P Ravine 20c
20 C Pacific 6⅝
450 Day 50@45c
350 Exchequer 5⅞
195 Eureka Con 23
350 Flowery 75c
200 Gould & Curry 11⅞@11⅞
790 Grand Prize 2.10@2
200 Golden Gate 3
500 Hillside 1.90
600 Independence 2
175 Justice 4@3.95
60 Jackson 4½
210 Julia 4.35
50 Jupiter 1.65
875 Lady Bryan 60@55c
10 Lady Wash 1.15
500 Leeds 75c
160 Mexican 37
100 Mount View 2⅞
700 Meadow Valley 5c
100 McClinton 80c
600 Metallic 45c
1100 Mackey 1.30@1.20
320 Mono 7@7½
1045 M White 2⅞@3
300 Mammoth 9
440 New York 60@65c
600 N Bonanza 1.70@1.65
250 Navajo 35c
100 Noonday 3
100 N Noonday 1⅞
400 Ophir 42@42½
160 Overman 9½@9½
390 Occidental 3
1500 Orient 25c
110 Potosi 6⅝
370 Paradise 2
250 Queen Bee 20c
270 Raymond & Ely 1
200 Red Cloud 26c
95 Savage 14⅞@14⅞
120 Sierra Nevada 47½@47½
300 Succor 5c
50 Silver Hill 1.60
505 Scorpion 3
500 Senator 20c
200 Solid Silver 30c
16 Syndicate 5⅞
100 Summit 1.60@1½
200 S Bodie 30c
100 S Bulwer 55c
250 Trojan 25c
660 Tioga Con 3.70@3½
145 Utah 19½@20
280 Union Con 73½@73⅞
150 University 10c
50 Woodville 40c
200 Wells-Fargo 10c
200 Ward 30c
50 Wales 10
630 Yellow Jacket 16⅞@16
350 Paradise 2@1.90
400 Queen Bee 45c
830 Raymond & Ely 1@1½
100 Syndicate 5½
600 S Bulwer 55@60c
300 S Standard 5c
165 Star 75c
150 Summit 1½
100 Silver King 4½
100 Tiptop 1
320 Tioga Con 3.45@3½
100 Tuscarora 20c
340 University 75c
80 Wales 10½

Monday A. M., Sept. 22.

60 Alta 6½@6⅝
210 Alpha 18⅞@18½
955 Andes 1.60@1½
410 Belcher 4½@4.35
485 Bullion 7⅞
140 Best & Belcher 19½@19⅞
335 Benton 3.60
270 California 6½@5⅞
600 Con Virginia 6@5⅞
80 Chollar 6⅞
50 Confidence 10½
200 C Dorado 1½
990 Con Imperial 1.40@1.35
110 Crown Point 3.60@3.55
50 Challenge 2.35
230 Caledonia 2.40
150 C P Ravine 20c
285 Exchequer 6@6½
725 Flowery 70@60c
500 Fairfax 90c
1776 Gould & Curry 12
350 Golden Gate 3
180 Hale & Nor 14@14½
725 Julia 4½@4.15
245 Justice 3.55@3.60
305 Lady Wash 1.20@1½
250 Leviathan 60@55c
270 Lady Bryan 1.10
345 Mexican 38½@38⅞
1400 Mackey 1.35@1.65
200 Mt View 2.80
745 N Bonanza 1.65@1.55
605 New York 60@65c
40 Overman 9@9½
605 Ophir 44@43⅞
895 Occidental 3⅞@5½
190 Potosi 5⅞@5½
600 Phil Sheridan 40c
500 Pioneer 20c
380 Scorpion 3.10@3
400 Solid Silver 35c
200 Silver Hill 1.65@1.60
5 Seg Belcher 24
200 Savage 14⅝@14½
620 Sierra Nevada 48⅞@48⅞
300 Trojan 25c
135 Utah 20½@20⅞
415 Union Con 74@74½
750 Ward 2.55
35 Yellow Jacket 16½

AFTERNOON SESSION.

650 Adenda 50c
1125 Argenta 80c
2000 Big Prize 45c
120 Belmont 60c
660 Belle Isle 5½@5½
290 Boston 1.30@1½
300 Belvidere 90@85c
115 Bulwer 12
160 Bodie 14½
670 Bechtel 1½
600 Black Hawk 95c
175 Booker 1.20@1½
900 Champion 25c
1325 C Pacific 7½@7½
100 Caledonia (B H) 2⅞
1440 Day 50@60c
660 Dudley 1.40@1.55
55 Eureka Con 22@22½
700 Endowment 40c
150 Gila 35c
566 Grand Prize 2½@2⅞
90 Goodshaw 35@30c
200 Giant & O A 6
550 Hillside 2@1.90
100 Hamburg 25c
610 Independence 2@1.60
600 Jupiter 1½
150 Leopard 10c
220 McClinton 80@70c
200 Modoc 1
70 Mt Diablo 5
100 Manhattau 3½
1300 M White 3½@3
260 Mammoth 7⅞@7½
400 Metallic 50@45c
260 Mono 6⅝
140 Northern Belle 4
350 N Belle Is 40c
500 Navajo 40c
300 Noonday 3
200 Oriental 15c

Tuesday A.M., Sept. 23.

215 Alpha 17½@18
485 Alta 6½@6
340 Andes 1.30@1.20
460 Benton 3½@3.55
260 Bullion 7⅝
400 Belcher 4⅜@4.45
50 Confidence 10½
45 Con Virginia 5⅝
170 Chollar 6⅞@7
350 California 5⅞@5½
200 C P Ravine 20c
70 Challenge 2.30
1250 Con Imperial 1.30@1.35
100 Crown Point 3.40
375 Caledonia 2.30@2½
35 Exchequer 5⅝
1310 Flowery 70@60c
90 Gould & Curry 11½@11⅝
550 Golden Gate 3½
70 H & Norcross 13⅝
265 Julia 4½@4.15
110 Justice 3.70@3.65
20 Kentuck 4½
700 Lady Wash 1.05@1
1595 L Bryan 70c@1
300 Mexican 37½
1320 Mackey 1.45@1½
290 New York 60c
740 N Bonanza 1.60@1.55
1120 Occidental 4.60@4½
15 Overman 9@9½
325 Ophir 42@42½
185 Potosi 5⅝@5½
150 Plutus 2½
240 Solid Silver 65@60c
180 Savage 14½@14
195 Scorpion 3.60@4
10 Seg Belcher 22
175 Sierra Nevada 47
390 Silver Hill 1.40
270 Trojan 25@20c
260 Union Con 73@73½
65 Utah 20@19⅞
830 Ward 2.65@2.60
20 Yellow Jacket 16⅝

AFTERNOON SESSION.

1640 Argenta 90@80c
180 Addenda 40@35c
400 Boston 1.35
250 Black Hawk 95@90c
150 Bulwer 11½
50 Booker 1.10
100 Belmont 60c
100 Belvidere 90@85c
410 Bodie 13⅞@13⅝
340 Bechtel 1½@1.40
2450 Big Prize 45c
1985 Belle Isle 5½@5½
360 Champion 25@30c
395 C Pacific 3
250 Dudley 1½
1430 Day 55@60c
365 Eureka Con 21@21½
95 Endowment 40c
100 Grand Prize 2⅞@2.60
410 Gila 35c
170 Goodshaw 25c
300 Hillside 1.90
815 Independence 1⅞@1.80
10 Jackson 4
140 Jupiter 1½
600 Leopard 60c
850 Martin White 2½@2½
160 Mammoth 7½
115 Mono 6⅝@6½
90 McClinton 60c
50 Modoc 1
30 Manhattan 3½
200 Metallic 50@55c
2600 N Belle Is 40c
15 Northern Belle 4
250 Noonday 3
500 Navajo 40c
1350 Orient 25@20c
250 Queen Bee 25@30c
1550 Raymond & Ely 1@1½
200 S Bulwer 60c
900 S Standard 5c
100 Syndicate 5½
50 Silver King 4⅞
550 Star 70@80c
470 Summit 1½@2
100 Tioga 3½
370 Tiptop 1.05@1
100 Tuscarora 20c
70 University 25@30c
100 Wales 10

Wed'sday A.M., Sept. 24.

210 Alpha 17⅞@17½
375 Alta 6½@6
135 Andes 1½@1.15
175 Benton 3.70
20 Bullion 7⅞
130 Belcher 4.40
5 Best & Belcher 18½
210 California 5⅞@5½
270 Con Virginia 5⅞@5½
10 Confidence 10⅞
10 Chollar 6⅞
350 Con Dorado 1⅞@1.90
40 Challenge 2.30
100 C P Ravine 20c
272 Caledonia 2.35
600 Con Imperial 1.35
360 Crown Point 3.40@3½
195 Exchequer 5⅞@5⅞
615 Flowery 65@60c
820 Golden Gate 3½@3½
90 Gould & Curry 11⅞@11⅝
110 Hale & Nor 13½
205 Julia 4½@4.20
60 Justice 3.85
650 Lady Bryan 90@95c
1010 Lady Wash 1.05@1½
1330 Mackey 1.70@1.60
100 Mountain View 2⅞@2.80
150 Mexican 37⅞@37½
30 North Con Vir 8½
680 N Bonanza 1.40@1.60
200 New York 50c
190 Ophir 42⅞@43
30 Overman 9
430 Occidental 3⅞@4
100 Phil Sheridan 40c
50 Potosi 5⅝
150 Plutus 2½
700 Solid Silver 50c
145 Sierra Nevada 47@46⅞
220 Savage 13½@13⅝
795 Scorpion 3½@3.30
250 Silver Hill 1.40@1.60
240 Trojan 20@25c
20 Utah 20
255 Union Con 72@73
50 Woodville 35c
200 Ward 2⅞@2.80
20 Yellow Jacket 16½

AFTERNOON SESSION.

200 Albion 10@15c
2470 Argenta 1@1.10
1550 Big Prize 45@40c
850 Boston 1.40
30 Booker 1.05
170 Belvidere 80c
260 Black Hawk 85@80c
115 Bodie 14@13⅞
65 Bechtel 1.40
400 Belmont 60c
740 Belle Isle 5⅝@5½
200 Caledonia (B H) 2.60
375 C Pacific 8½
125 Dudley 1½
400 Day 56c
100 Endowment 50c
400 Eureka Con 21½
335 Grand Prize 2.60@2⅞
100 Goodshaw 30c
300 Giant & O A 6
425 Gila 35@30c
300 Hussey 5c
220 Hillside 1.90@1.85
350 Independence 2@1.95
240 Jupiter 1½@1
380 Leopard 60@55c
240 Martin White 2.10@2
110 Mammoth 7½@7½
290 Mono 6½@6⅞
600 Metallic 60@55c
180 Modoc 1½
3750 N Belle Is 40c
80 Noonday 3@2.90
80 Navajo 40@35c
100 N Noonday 1⅞
950 Orient 25@20c
50 Oriental 20c
30 Queen Bee 30c
200 Raymond & E 1.10
100 S Bodie 25c
100 Syndicate 5½
630 Star 75@80c
300 Tuscarora 20@15c
400 Tioga Con 3@3.05
300 Tiptop 1.05
200 University 30c
240 Wales 10½@10

SALES OF LAST WEEK AND THIS COMPARED

Thursday A.M., Sept. 18.

290 Alpha 19⅞@20
45 Alta 6½
330 Andes 1.05@1
130 Belcher 4½
225 Best & Belcher 17½@17⅞
535 Bullion 7⅞
310 Benton 3.70@3.60
215 California 4.90@5
105 Con Virginia 4.95
10 Chollar 6⅝
60 Confidence 10⅞
1595 Con Imperial 1.45@1.40
185 Caledonia 1.90@2
120 C P Ravine 20c
300 C Dorado 1⅞@1.80
270 Challenge 2½@2.35
370 Exchequer 6½@6⅝
150 Flowery 60c
170 Gould & Curry 11⅞@11½
140 Hale & Nor 13⅞@13⅝
120 Justice 3.90
80 Julia 4.20
50 Kentuck 4.30@4.40
1090 L Bryan 45@ 0c
500 Lady Wash 1.15
20 Leviathan 50c
365 Mexican 37@37½
100 Mt View 2½
550 Mackey 1.20@1.10
250 N Bonanza 1⅞
580 Ophir 40½@41
170 Overman 9½@9½
40 Potosi 5½
200 Phil Sheridan 50c
150 Savage 13⅞@14
315 Sierra Nevada 46½@46
5 Seg Belcher .20
240 Silver Hill 1.60@1.70
670 Scorpion 3
400 Trojan 35c
135 Utah 19½@20
110 Union Con 70½@70½
100 Woodville 35c
1550 Wells-Fargo 10c
780 Ward 2.45@2½
270 Yellow Jacket 16½@16⅝

AFTERNOON SESSION.

200 Addenda 50c
200 Aurora T 20c
300 Argenta 75c
1550 Belle Isle 4.70
180 Black Hawk 90c
200 Booker 1.10
200 Boston 1.30
175 Bulwer 11½
670 Big Prize 35@45c
335 Bodie 14
120 Bechtel 1.50
200 Belvidere 85c
725 Champion 25@20c
45 C Pacific 6⅞
1248 Day 60@50c
200 Dudley 1
750 Defiance 50c
165 Eureka Con 29@28½
300 Fourth July 60c
250 Gila 40@35c
500 Grand Prize 2
50 Goodshaw 30c
50 Golden Terra 12
200 Hussey 5c
550 Independence 2.05@2.10
300 Jupiter 1.60
200 Leopard 10c
850 Martin White 2.15@2.10
750 Metallic 45@50c
220 Mono 6⅞@7
750 Navajo 40c
800 N Belle Is 40c
230 Oriental 20c
1220 Orient 25c
600 Paradise 2.05
200 Queen Bee 30c
100 Richer 30c
420 Raymond & Ely 65c
630 Star 50@60c
200 S Bulwer 55c
100 S Bodie 30c
30 Syndicate 6⅞
100 S Standard 10c
180 Summit 1½@1.45
260 Tioga Con 3½@3½
175 Tiptop 85c
500 University 15c
120 Wales 10

Thursd'y A.M., Sept. 25.

510 Andes 1.20@1.05
100 Alpha 17⅞
100 Alta 6@6½
220 B & Belcher 18@18⅞
195 Belcher 4½@4.30
735 Bullion 8
110 Benton 3.55
15 Confidence 10⅞
10 Chollar 6⅞
260 California 5⅞
200 Con Imperial 1.35
360 Crown Point 3.35@3.45
150 Con Virginia 5½@5⅝
200 Caledonia 2.40@2½
500 Con Dorado 2@1.90
310 Exchequer 6
50 Fairfax 90c
200 Gould & Curry 11⅝@11⅞
50 Golden Gate 3½@3.60
80 Hale & Nor 13⅞@13⅞
555 Julia 4.15@4.10
50 Justice 3.80
10 Kentuck 4½
250 Lady Bryan 1@95c
500 Lady Wash 1.10
750 Leviathan 55c
375 Mexican 37½@37
60 Mt View 2⅞
1210 Mackey 1.70@180
300 New York 55c
100 North Con Vir 8⅞@8⅞
160 N Bonanza 1.60@1.70
480 Ophir 43½@43⅞
10 Overman 9½
130 Potosi 5⅞
150 Sierra Nevada 47@46⅞
95 Savage 14@14⅛
130 St Louis 40c
365 Silver Hill 1½@1.60
300 Scorpion 3.65@3.70
75 Solid Silver 25c
380 Union 71½@70½
50 Woodville 40c
1300 Ward 3@3.10
265 Yellow Jacket 16½

AFTERNOON SESSION.

250 Addenda 35c
2470 Argenta 1.10
100 Albion 10c
2205 Belle Isle 5½@5⅞
300 Boston 1.40@1.55
30 Bulwer 11
50 Booker 1.10
160 Black Hawk 85c
30 Belvidere 85c
2000 Big Prize 45c
120 Bodie 13⅞
230 Bechtel 1.40
100 Concordia 20c
300 Caledonia (B H) 2½
450 C Pacific 9@8⅞
300 Crœsus 20c
2850 Day 60@50c
350 Dudley 1.40@1½
120 Eureka Con 22
300 Ennowment 50c
195 Grand Prize 2½@2.60
200 Gila 35@25c
150 Giant & O A 6
200 Goodshaw 30c
200 Hillside 1.90
200 Hussey 15c
350 Independence 1.95@2
5 Jackson 4
450 Jupiter 1½
50 Leopard 55c
690 M White 2.10@2
220 Mammoth 7½@7½
200 Modoc 1½
225 Mt Diablo 5½@6
2100 N Belle Is 40c
10 Northorn Belle 3⅞
1500 Navajo 40c
850 Noonday 3
500 N Noouday 1⅞@1.80
400 Orient 25@20c
100 Paradise 1.60
350 Queen Bee 30@35c
50 Rustler 50c
100 Raymond & E 1.10
50 S Bulwer 55c
180 Star 75@80c
200 S Bodie 30c
225 Summit 1.85@1.90
60 Tioga Con 3.05
1550 Tiptop 1
400 University 30@35c
300 Vortex 40c
30 Wales 11½

California Board—Latest Sales.

Wed'sday A.M., Sept. 24.

20 Alpha 18
80 Alta 6½@6½
400 Argenta 1
100 Andes 1.20
850 Atlas 11c
20 Belcher 4.20
30 Best & Belcher 18½@18⅞
30 Bullion 7⅞
20 California 5½
50 Con Virginia 5½@5⅞
200 Con Imperial 1.36
20 Crown Point 3.55
50 Chollar 6⅞@6⅞
30 Challenge 2½
250 Caledonla 2.35

AFTERNOON SESSION.

20 Alpha 17⅞@18
500 Atlas 10@11c
50 Alta 6@6½
300 Argenta 1
100 Andes 1½
100 Almaden Q 3
40 Belcher 4.40
20 Best & Belcher 18⅞
30 Bullion 7½@7⅞
40 Benton 3½
400 Big Prize 47½c
40 California 5⅞
50 Con Virginia 5½
100 Con Imperial 1.35
20 Crown Point 3.40
40 Challenge 2⅞@2.30

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Con M Co	Nevada	10	1 00	Aug 7	Sept 11	Oct 1	Wm Willis	309 Montgomery st
Argonaut M & M Co	California	1	05	Aug 11	Sept 15	Oct 6	J L Fields	240 Montgomery st
Benton Con M Co	Nevada	2	50	Sept 17	Oct 22	Nov 10	W H Watson	302 Montgomery st
Best & Belcher M Co	Nevada	15	1 00	Aug 29	Oct 2	Oct 22	Wm Willis	309 Montgomery st
Bullion M Co	Nevada	11	50	Aug 12	Sept 16	Oct 7	J M Brazell	418 California st
Caledonia S M Co	Nevada	28	50	Aug 21	Sept 26	Oct 17	R Wegener	414 California st
Champion M Co	Nevada		05	July 26	Aug 31	Sep 30	G C Hurlbut	525 Commercial st
Chollar M Co	Nevada	1	60	Aug 29	Oct 3	Oct 24	W E Dean	203 Bush st
Crown Point G & S M Co	Nevada	38	1 00	Aug 27	Oct 1	Oct 22	James Newlands	203 Bush st
Concordia M Co	California	2	15	Aug 20	Sept 26	Oct 21	A W Fox	310Pine st
Dudley M Co	California	5	50	Aug 14	Sept 17	Oct 13	E C Masten	22 Nevada Block
Eagle S M Co	Nevada	14	10	Aug 4	Sept 10	Sept 30	J E Byrne	533 Kearney st
Flowery M Co	Nevada	2	25	Aug 6	Sept 10	Sept 30	W W Stetson	309 Montgomery st
Goodshaw M Co	California	4	25	July 9	Aug 23	Sept 30	V Fernbach	327 Pine st
Grand Prize M Co	Nevada	2	60	Sept 17	Oct 21	Nov 11	J E Dixon	20 S F Stock Ex
Hale & Norcross S M Co	Nevada	62	1 00	Sept 9	Oct 14	Nov 4	J F Lightner	58 Nevada Block
Hussey Con G & S M Co	Nevada	9	15	Aug 25	Sept 30	Oct 21	Jno E Dixon	20 S. F. Stock Ex.
Jupiter M Co	California	5	30	Sept 18	Oct 21	Nov 10	E C Masten	22 Nevada Block
Justice M Co	Nevada	—	1 00	———	Sept 11	Sept 30	R E Kelley	419 California st
K K Con M Co	Nevada	—	1 00	Aug 1	Sept 3	Oct 1	B B Minor	309 Montgomery st
Leopard M Co	Nevada	12	50	Aug 23	Sept 26	Oct 17	Jno E Dixon	20 S F Stock Ex.
Leviathan M Co	Nevada	9	25	Aug 6	Sept 9	Sept 30	F E Luty	330 Pine st
Mexican G & S M Co	Nevada	8	1 50	Sept 11	Oct 15	Nov 6	C L McCoy	203 Bush st
Mono G M Co	California	5	1 00	Sept 4	Oct 9	Oct 29	W H Lent	309 Montgomery st
North Bonanza M Co	Nevada	3	25	Aug 13	Sept 17	Oct 7	W W Stetson	309 Montgomery st
Original Keystone S M Co	Nevada	2	25	July 28	Sept 1	Sept 28	F E Luty	330 Pine st
Occidental Con G M Co	California	2	03	Aug 11	Sept 29	Oct 20	W T Smith	402 Montgomery st
Potosi M Co	Nevada	1	50	Aug 29	Oct 7	Oct 28	W E Dean	203 Bush st
Real Del Monte M Co	Nevada	8	1 00	Sept 18	Oct 20	Nov 29	C V Hubbard	203 Bush st
Savage M Co	Nevada	39	1 00	Sept 22	Oct 31	Nov 20	E B Holmes	309 Montgomery st
Sierra Nevada S M Co	Nevada	59	2 00	Aug 30	Oct 3	Oct 22	W W Stetson	309 Montgomery st
South Standard M Co	California	5	15	Sept 11	Oct 15	Nov 3	C A Sankey	331 Montgomery st
Succor M & M Co	Nevada	24	25	Aug 30	Oct 3	Oct 23	Wm H Watson	302 Montgomery st
Tioga Con M Co	California	7	30	Sept 10	Oct 15	Nov 4	W H Lent	62 Nevada Block
Tuscarora M & M Co	Nevada	4	10	Aug 2	Sept 6	Sept 30	M E Sperling	309 California st
University G M Co	California	3	20	Aug 21	Sept 24	Oct 15	W L Oliver	326 Montgomery st
Yellow Jacket S M Co	Nevada	33	1 00	Aug 4	Sept 8	Oct 8	Mercer Otey	Gold Hill, Nevada

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Butte Creek Hyd M Co	California	3	15	Sept 18	Oct 20	Nov 5	R L Taylor	310 Pine st
Butte Hydraulic M Co	California	—	10 00	Aug 25	Sept 29	Oct 21	L L Dennery	328 Montgomery st
Crœsus G & S M Ce	California	2	10	Aug 22	Sept 23	Oct 11	E Huestis	328 Montgomery st
Dardanelles M Co	Nevada	7	50	Sept 9	Oct 10	Oct 27	H C Hinman	411 California st
De Haro M Co	Nevada	2	10	Sept 24	Oct 27	Nov 12	W W Bausman	409 California st
Double Standard G M Co	California	1	10	Sept 13	Oct 21	Nov 11	W H Lent	309 Montgomery st
Diana G & S M Co	Nevada	4	10	Sept 24	Oct 28	Nov 15	J T McGeoghau	318 Pine st
Dudley M Co	California	5	50	Aug 14	Sept 17	Oct 13	E. C. Masten	309 Montgomery st
Equitable Tunnel & M Co	Utah	21	10	Sept 16	Oct 21	Nov 14	C J Collins	227 Montgomery st
Geo Douglas M Co	Nevada	3	10	Sept 24	Oct 27	Nov 13	W W Bausman	409 California st
Hamburg M Co	Nevada	1	1 00	Sept 19	Oct 21	Nov 10	D A Jenning	401 California st
Harrington M Co	California	1	20	Aug 11	Sept 18	Oct 8	W W Bausman	426 California st
Joe Scates Con S M Co	Nevada	4	10	Sept 24	Oct 27	Nov 13	W W Bausman	4:9 California st
Keystone S M Co	California	2	25	July 28	Sep 16	Oct 6	F E Luty	330 Pine st
Mayhello Con M Co	California	3	10	Sept 8	Oct 15	Nov 10	A W Fox	310 Pine st
Meadow Valley M Co	Nevada	15	25	Sept 12	Oct 22	Nov 17	T W Colburn	414 California st
Mt Hood M Co	Nevada	3	10	Sept 24	Oct 27	Nov 13	W W Bausman	409 California st
North Scorpion M Co	Nevada	1	10	Aug 11	Oct 15	Nov 6	T B Ludlum	211 Sansome st
Original Keystone S M Co	Nevada	2	25	July 28	Sept 1	Sept 28	F E Luty	330 Pine
Occidental M Co	Nevada	5	50	Aug 11	Sept 15	Oct 6	A K Purhrow	309 Montgomery st
Quartz Mountain G M Co	California	7	50	Sept 20	Oct 27	Nov 17	E Hestres	729 Montgomery st
Red Hill H M & W Co	California	2	03	Sept 1	Oct 2	Oct 18	A B Paul	228 Montgomery st
Sabine M Co	Nevada	2	10	Sept 24	Oct 27	Nov 12	W W Bausman	409 California st
Santa Mina G M Co	California	1	15	Aug 29	Oct 2	Oct 22	J H Sayre	330 Pine st
Sherwood Con M Co	Nevada	2	10	Sept 1	Oct 6	Oct 23	H S Stone	309 California st
South Utah M Co	Nevada	3	10	Sept 5	Oct 6	Oct 25	C S Healy	45 Merchants Ex
South Comstock G & S M Co	Nevada	6	25	Sept 9	Oct 13	Nov 3	J M Buffington	309 California st
Tolo M Co	Nevada	2	10	Sept 24	Oct 27	Nov 12	W W Bausman	409 California st
Vancouver M Co	Nevada	3	10	Sept 24	Oct 27	Nov 13	W W Bausman	409 California st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Diana G & S M Co	Nevada	J T McGeoghan	318 Pine st	Annual	Oct 6
Fairfax M Co	———	O O Miller	426 California st	Annual	Oct 3
Gold Deposit M Co	California	J M Buffington	309 California st	Stockholders	Oct 7
Golden Gate Con Hy M Co	California	J T McGeoghan	318 Pine st	Annual	Oct 6
Humboldt M Co	———	W L Oliver	328 Montgomery st	Annual	Oct 1
Kelsey G & S M Co	California	J H Sayre	330 Pine st	Annual	Oct 7
Lady Emma G M Co	———	F R Bunker	606 Montgomery st	Annual	Oct 6
Mayflower Gravel M Co	———	J Morrizio	328 Montgomery st	Annual	Oct 6
McCrackin Con M Co	Arizona	Wm Noyes	309 Montgomery	Special	Oct 3
N Scorpion M Co	Nevada	C E Gillett	211 Sansome st	Annual	Oct 6
Syndicate M Co	California	Jacob Stadfeldt Jr	419 California st	Annual	Oct 16

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Belle Isle M Co	Nevada	John E Dixon	Stock Exchange	50	Aug 5
Bodie Con M Co	California	W H Lent	Nevada Block	1 00	Aug 1
California M Co	Nevada	C P Gordon	23 Nevada Block	50	Aug 17
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	50	Aug 16
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	1 00	July 21
Independence M Co	Nevada	John E Dixon	Stock Exchange	25	Aug 21
Indian Queen M & M Co	———	A K Durbrow	69 Nevada Block	20	Aug 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	July 26
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	30	July 28
Montezuma M & M Co	———	J T McGeoghegau	318 Pine st	25	Aug 12
Standard Con M Co	California	Wm Willis	309 Montgomery st	50	Aug 12

50 Exchequer	5½	40 Caledonia	2.35
20 Gould & Curry	11½	200 Coso Con	4@3c
500 Gipsy Q	22½@25c	70 Exchequer	6
30 Hale & Nor	13½@13½	50 Enterprise	11
60 Julia	4.15@1.20	30 Gould & Curry	11½
40 Justice	3.80@3 85	200 Gipsy Q	25c
20 Mexican	37½@37½	100 Golden Gate	3
100 Mint	10c	10 Hale & Nor	14
135 New York	60c	30 Julia	4.20
20 Ophir	42½	20 Justice	3.85
40 Savage	13½@13½	30 Mexican	37½@37½
30 Sierra Nevada	47	100 Newark	12c
100 Succor	5c	30 Ophir	44½@44
120 Silver Hill	1.60	110 Phil Sheridan	40c
450 Trojan	21½@20c	40 Savage	14@13½
30 Union Con	72½@72½	10 Sierra Nevada	47½
40 Yellow Jacket	16½@16½	20 Union Con	74@74½
		30 Yellow Jacket	16½@16½

Pacific Board—Latest Sales.

Wed'sday A.M., Sept. 24.		AFTERNOON SESSION.	
40 Alta	6		
50 Alpha	18½@18	1550 Atlas	10@12½
260 Andes	1.20@1	10 Alpha	18
160 Bullion	7	200 Andes	1.20
140 Best & Belcher	18½@18	10 Best & Belcher	18½
30 Belcher	4.40	50 Belcher	4½
230 Benton	3.40	120 Benton	3.60
140 Crown Point	3.40	35 Bullion	7½@7
100 Chollar	6½	100 Belle Isle	5½
50 California	5.45	40 Chollar	6.95
310 Caledonia	2.30@2	200 C P Ravine	25c
210 Coe Imperial	1.30@1.35	100 Exchequer	6½
100 Exchequer	5½	120 Julia	4½@4.20
150 Golden Gate	3	90 Mexican	38
110 Gould & Curry	11½	100 Mono	6½
110 Hale & Nor	13½	100 Mackey	1.80@1
255 Julia	4.15@4.20	100 N Standard	2½
50 Justice	3.85	10 N Bonanza	1.65
110 Mexican	37½@37½	50 North Con Vir	8½
50 Occidental	3½	50 New York	15c
200 Ophir	42½@44	30 Ophir	44½@44½
20 Overman	9½@9	60 Potosi	5½@5.80
110 Savage	13½	40 Silver Hill	1.55
80 S Nevada	47@46½	10 Sierra Nevada	48
50 Scorpion	3½	20 Uncle Sam	2
10 Union	73	10 Union Con	74
70 Utah	20	250 Ward	2.80@3
10 Yellow Jacket	16½	20 Yellow Jacket	16½

The Mining Share Market.

The week opened with a strong market and an upward tendency, a demand being made particularly for Ophir and Union Con. which caused them to jump up considerable.

The Bodie stocks picked up during the week, owing to improvements in the mines, which advanced some of the minor stocks as well. On Tuesday the market opened strong, but weakened in the afternoon session on Monday. An improvement was manifested in Comstocks, and stocks of every description showed signs of recovery. Favorable news from the Comstock in the shape of a telegram did not sustain the market as would have been the case under ordinary circumstances. The shaky condition of things on Tuesday prevented the complete revival from the symptoms of drooping.

Thursday opened strong, but weakened towards the close. There is a general slackness without much change in prices. Business is apparently dull, causing a heaviness of the market. The most of the standard stocks are somewhat lower than they were in the beginning of the week.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Northern Belle, Sept. 15th, $2,962.62; Alexander, Sept. 19th, $8,199.60; Hillside, Sept. 21st, $5,300; Bodie Con., Sept. 16th, $21,579.03; Northern Belle, Sept. 17th, $2,909.49; Ophir, Sept. 20th, $43,065.43; Belle Isle, Sept. 22d, $24,000; Independence, Sept. 22d, $4,000; Martin White, Sept. 17th, $3,037.74; Christy Con. Sept. 20th, $6,029; Paradise Valley, Sept. 17th, $5,400; Bodie Con., Sept. 22d, $46,200; Northern Belle, Sept. 20th, $6,078.87; Standard Con., Sept. 15th, $19,031.94; Martin White, Sept. 21st, $3,921.33..

DISASTER PEAK.—The *Silver State* says that two companies are at work on the recently discovered mines of Disaster Peak, Nevada, in the northern part of the county. The ore from one of the ledges named the Santa Rosa, assayed over $300 per ton in gold and silver, and from another lead owned by Tom Shaw, the assays average $250 per ton. Mr. Baber says the whole mountain is covered with float quartz, containing gold and silver, and the district is one of the most inviting in the State for prospectors.

THE demand in Great Britain and on the continent of Europe for American produce of all kinds appears to be growing more extensive. Overflowing freight cargoes continue to be sent over there, and the number of steamships engaged in the traffic constantly increases. Twelve heavily-loaded steamers left New York on Saturday. The grain shipment then exceeded that of any previous single day, being 50,000 bushels.

AS AN indication of the extent of salmon fishing business on the Pacific coast, the Vancouver *Independent* notes the fact that during the catching season $20,000 per day are paid out to those employed in the various departments of the work. At a fair price, the aggregate sum brought by this season's catch, when sold, will be upward of $2,000,000.

A HUNTER from the lakes says the hogs on Buena Vista lake, Kern county, make their living by diving in deep water for clams. The clams are very abundant and fat, but, being fresh, are tasteless, except for the flavor of the black mud in which they lie.

SEVERAL New Jersey cities are so heavily in debt that unless relieved by the Legislature they will go into bankruptcy.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

VICTORIA.—*Ledger:* This is a quartz claim one mile southeast of Plymouth. The shaft has attained a depth of 100 ft. During the carrying out of the last contract to sink the shaft 100 ft, the workmen struck a quartz ledge two ft wide, the rock of which is said to be of a paying character. An additional 100 ft of tunnel will be sunk.

OLETA MINING.—S. H. Clark is operating his gravel and cement claim. Last season, it will be remembered, he struck a body of gold-bearing cement, which had to be crushed in a mill, the same as quartz. This cement has been exhausted, and the miners are now working in gravel that washes freely. There is no water available at present, but the gravel is being stored for future washing. This gravel has been tested, and has paid as high as $1 to the carload. It is thought that it will average as high as $2.50 to the carload. There is a large body of gravel in sight, that cannot be exhausted for years.

MIDDLE BAR.—McKinney & Oranice are working a small quartz lead, one foot wide, the rock from which is remarkably rich in places. The ore is of a different nature to that met with in other parts of the county. It has to be roasted previous to being crushed. They crush it by means of a hand mortar, throwing aside all rock that will not yield from 50 to 75 cents a pound. One hundred pounds can be treated in this manner in a day, which, placing the yield at an average of 50 cents per pound, leaves a handsome margin of profit. Three years ago this lead surrendered one ton of quartz which yielded an average of $3 per pound, the lucky owners realizing over $6,000 from its crushing.

GWIN MINE.—The batteries are kept constantly employed, rock being mined from both the 1400 and 1500 levels. The hoisting works that for some time have been in progress of erection at the new shaft on the Alexander mine are completed and sinking has been commenced.

MISCELLANEOUS.—The Phœnix, of Plymouth, is looking better than ever. Ninety-five pounds of refined bullion were shipped last month at one time, and $5,000 at another. At a place called Mile gulch, near the Centennial mine, J. A. Purinton, of Oleta, intends to work a gravel claim this winter. There is 600 ft of flume in position, and pipe and giant will be in readiness by the time that water can be obtained.

BUTTE.

BIG BAR.—*Mercury*, Sept. 20: We learn that this mine will again be opened up this coming winter. The work done so far developed the fact that there is a rich paying streak of gravel along the bedrock that will pay the owners well. Hereafter the mine will be worked by the drifting, instead of the hydraulic process. It is the opinion of good miners that this is one of the richest beds of gravel in this part of the State. The mine has been put in excellent working order recently and its future prospects are flattering.

NEW MINING ENTERPRISE.—The Frost & Reece Canal mining company are developing some valuable mining property in Strawberry valley. A mill for cutting the lumber required is now being erected, and what has for years been an almost deserted section of country is assuming an air of thrift and activity. This undertaking will open up a vast expanse of territory known to contain extensive and valuable auriferous deposits which it has been impossible to work heretofore owing to a lack of water. It is estimated that fully 3,000 acres of gravel deposit will be placed on a working basis by the water carried in the new ditch. The capacity of the ditch will be 5,000 inches per day of 12 hours.

CALAVERAS.

BIG BONANZA.—*Chronicle*, Sept. 20: Final clean-up has been made on this hydraulic on Tunnel ridge, opposite Sport hill. Yield quite large and enabled the company to declare a dividend of about $3,000 per share.

INYO.

MONDOK.—*Independent:* Face of east crosscut, 300, in fine ore country, and looks very encouraging. In running we have cut two ore veins, which have the appearance of joining below the ore run on in main drift. The point continues to improve as it is prospected, and promises well. Ground in 800 drift and 1000 crosscut is looking better than ever. Started on the underdrain from the 1000 point to 1800 ledge.

CERRO GORDO.—The Union Con. mine has ore enough on hand to supply the furnace for at least six months to come, while it seems no trouble to break out enough every day to keep it running steadily, which it is now doing, but will have to make a short stop in a few days for the usual repairs. The furnace is under the immediate supervision of its old-time manager, Mr. F. F. Thomas. Ten to 12 tons of silver ores are put through daily. The refinery is in charge of Mr. E. A. Smith and his son. In refining, the litharge after going through the refinery, is again run through the furnace, which is heavily charged with silver and iron ores, but very little lead or galena being required. There is an abundance of both lead and galena on hand, so there is no further trouble to be feared on account of a scarcity of these for a flux.

RUNNING ARASTRAS.—The Mexicans are running a number of horse-arastras on the rich gold ores of Beveridge district, and all are said to be making '49 wages.

LOS ANGELES.

ANAHEIM.—*Gazette:* Samples of ore, 50 ft below surface, from the Santiago gold and silver mining company, showed traces of gold, and about $100 in silver per ton. The galena ore from the surface assayed $254 per ton.

MONO.

UNIVERSITY.—*News*, Sept. 21: Work below ground suspended, pending the erection of the building and putting machinery in place. The old works have been torn down, and the lumber utilized in the new building. The engine is a double-compressed engine from the Risdon Iron Works, and is capable of hoisting from a depth of 1,800 ft, and, with live steam, even a greater distance. The boiler is 54 inches by 16 ft in size, made of the best iron, and capable of generating steam enough for two such engines as the one being put up. The cable is of the flat pattern, made of the best steel, and is 1,500 ft in length. Work below ground will commence this week.

MARYLAND CON.—Shaft down and timbered 115 ft, making about two ft per day. Putting in 6x8 timbers, posts 6x6, center 4x6, lining 2x12 plank. Running from 250 level to connect with vertical shaft. Rock getting softer as depth is made, and it will soon be possible to make more rapid progress. As the upraise is pushed ahead, streaks of quartz, in reddish porphyry, are encountered, which are considered good indications. Will commence crosscutting east for the ledge, which pitches away from the main shaft.

OODSHAW.—At work cutting out pump stations at the 250 and 450 levels. On the surface are engaged constructing tanks and making other preparations for the reception of pumping machinery. South drift, on vein No. 2, from east crosscut, 450 level, has been advanced 15 ft since last report.

BODIE TUNNEL.—Now in 1,180 ft. The vein cut at 1,165 ft will be prospected at an early date. Work has been suspended temporarily on the vein at the 000 station, on account of the absorption of air during the hot weather, but will be resumed as soon as the atmosphere becomes colder, which will give a better supply of pure air.

AJAX.—Shaft now down 120 ft, seven ft having been made during the week. A portion of the time since last report have been busily at work cribbing the shaft, which delayed the work of sinking in a great degree. The bottom of the shaft is now in a hard formation.

NOONDAY.—*Chronicle:* North drift on 200 level is in 190 ft, on old Noonday ledge. The south drift on the old Noonday ledge is in about 60 ft south of the whim shaft. The combination shaft is down 335 ft. Have cut out a station on each side of shaft, at 312 level, 10 ft high and 20 ft in length, and have started a drift east and west from this station. Full connection has been made with the old Noonday works on the 212 level.

TIOGA.—The shaft is down 619 ft, at present in hard blasting ground. The Syndicate drift is in 419 ft, and is now running 470 east of north, to connect direct with the main Syndicate tunnel. The face of the drift is in vein matter, carrying seams of rich quartz. The south lateral drift on vein No. 3, 520 level, is in 116 ft, and the whole face of drift is in very fine ore. The north lateral drift, on same vein, is in 100 ft and looking as well as usual. The winze from 520 level is down 72 ft, vertical. Will not drift for the vein till the winze is down 100 ft. Have started an upraise on vein No. 2, and it is showing fine ore.

BLACKHAWK.—The winze on Liberty vein, 220 level, sunk 5 ft, making a total of 53 ft. Vein continues about 22 inches, and assays $15 to $20. The drift at bottom of deep winze has been driven 6 ft—a total of 16 ft. The formation looks favorable, and improving. Progress on the east drift, same level, 0 ft—total 188 ft, east of shaft. The formation continues hard.

QUEEN BEE.—The winze on ledge No. 1, east, in north drift, is down 67 ft. It has been sunk west of the ore body to escape water. It is in quartz and porphyry. An upraise east of the winze is up 8 ft, the ledge being 5 ft wide of solid ore. Crosscut from main shaft, west, is in 300 ft in favorable ground, and is evidently near the ledge. When the winze attains a depth of 100 ft, will drift to cut the ore body.

SOUTH BULWER.—Work in north drift from winze No. 2 is being pushed ahead vigorously and looking well. The upraise on the ledge, from 300 level, has been advanced 13 ft in good ore. Preparations are making to resume sinking the shaft.

MAMMOTH.—*Review:* During the week past 13 ft has been added to crosscut No. 7, making a total of 25 ft in the ore body; 11 ft added to crosscut No. 6, making a total of 20 ft. Bonanza, on tunnel No. 2, is in 73 ft beyond crosscut No. 7; the winze in tunnel No. 2 has been advanced eight ft, making a total of 182 ft. Tunnels No. 3 and 4 have added 11 and 13 ft respectively to their length.

JORDAN.—Work progressing steadily. Work on incline suspended, and are now sinking on vertical shaft, which is down 45 ft, showing eight ft of good milling ore. At the depth of 75 ft crosscutting will be commenced.

GREAT EASTERN.—Tunnel now in 40 ft. Assays average according to last report, from $15 to $180 per ton. Ore body steadily increasing as they advance.

DON QUIXOTE.—This mine has let a contract to run a tunnel 350 ft, which is to tap the ledge at a vertical depth of 400 ft.

ARMSTRONG.—Work progressing steadily. Shaft down 80 ft, the bottom shows fine ore, in small quantities, which increases as depth is attained.

TRUE BLUE.—Tunnel is 185 ft through the east country rock and entering the mineral belt.

HUTCHINSON CON.—Three-compartment shaft is down 100 ft. Work was suspended on the 19th prox., but will start up again at an early date.

OPHIR.—Shaft down 12 ft and a large body of ore in sight, assaying from $20 to $70 per ton. Work suspended for the present.

EUREKA.—Shaft down 12 ft and ledge 12 ft wide, with assays from $20 to $170 per ton.

LAST CHANCE.—Shaft down about 20 ft, and shows a fine body of mineral. No work done since last report.

WISCONSIN.—Tunnel is in about 160 ft, and no ore in sight.

NEVADA.

ROCKY BAR MINE.—*Transcript*, Sept. 19: One hundred and five ft have been made in the drain drift from New York Hill ground, and the Chevanne incline carried down 370 ft. A drift is also being run from the Chavanno shaft to the new shaft (300 ft) on the upper end of the claim. The ledge at both shafts is of good size and quality. The last crushing from the mine amounted to 115 loads—65 from the new shaft and 50 from the Chavanne—the former paid $31 per load, and the latter $38.50 per load without sulphurets. The quartz taken from the Chavanne shaft, which paid so well, was within a few feet of the point where work was suspended in the mine a dozen or more years ago, and the rock now coming out looks equally well. The extension of the drifts is making it possible to extract the quartz more rapidly, and last week 80 loads were raised, being the largest amount for any one week since work was commenced upon the mine. Another crushing of rock is now going through the mill, which is taken from both shafts, which will amount to between 200 and 300 loads. The pumps in the mine are handling all the water easily, and draining adjoining claims, which gives an opportunity for prospecting by windlass-power, which is availed of.

BLACK JACK.—A six-horse power engine for the Black Jack mine in Jim Crow canyon was received here Wednesday by the narrow gauge, and forwarded to Sierra county yesterday. A four-stamp mill has been erected on the mine, and this engine is intended to operate it.

MOUNT AUBURN.—Operations have been commenced on this quartz mine, under the direction of Mr. Kirby, superintendent of Swamp Angel Gravel claim. New machinery is to be put in.

GOOD START.—Some parties recently extracted 10 tons of ore on the Williams ranch, Gold Flat, beginning with the croppings, and realized $35 per ton, the crushing being made at Crosby's mill. This new development is near the Crosby & Olive mine, and, we understand, on the same ledge.

NEW FIND.—*Herald*, Sept. 20: J. Noya and others are developing a quartz lead on the McIntosh ranch, near Rough and Ready. They have sunk shafts on the ledge which first appears in the shape of four stringers, which unite as they go down. This find is supposed to be an extension of the old Shamrock ledge, which yielded so well many years ago. The quartz thus far taken out looks well. The ledge where united is 2 ft thick, and the rock can be easily worked.

RICH CEMENT.—We were to-day shown some very rich samples of cement taken from the claim of Sargent & Jacobs, at Quaker Hill. The specimens were literally filled with specks of gold, some of them larger than pin heads.

PROMISING GRAVEL MINE.—According to the *Transcript* the recent developments made on the land of J. C. Broderick in Little Grass Valley, near Columbia Hill, are most encouraging. By employing three shifts of miners and using horse-power a shaft has just been sunk at a point 300 ft south of the former ones where so much water came in as to interfere with continual operations without machinery. This last was put down 30 ft before bedrock was struck. A bed of blue gravel 22 ft thick, and rich in coarse gold, was passed through. The bedrock at the bottom of the shaft was pitching towards the hill on the east at the rate of 2½ ft in four. The gravel was of the same general character as that found in the shafts on the north, but richer in coarse gold towards the bottom. This property is so situate that it can be worked either by drifting or by hydraulicing, and present indications are that it will prove one of the best paying ever discovered in this part of the State. Mr. Broderick is now making arrangements to develop it on an extensive scale.

NEW LEDGE.—Truckee *Republican*, Sept. 20: Prospectors have found a well-defined quartz ledge at Ewer's ranch, eight miles northwest of Truckee. The quartz shows considerable gold.

RICH STRIKE AT DERBEC.—*Transcript:* Col. A. K. Bishop of North Bloomfield reports a wonderful strike at the Derbec mine. He says that on Saturday night while the miners were pushing the east drift ahead a seam was developed where the gravel yielded several hundred dollars to the pan, and that between $15,000 and $30,000 were extracted within the distance of a few feet. Some of the chunks of gold are reported to weigh an ounce each. It was from this same drift that $43,000 was taken while Thomas Mein was superintendent of the claim. This extraordinary seam is supposed to extend northeast from the Derbec through the Marlow, Black, Haney and Bishop mines, all of which are situated within a mile of the first named. Six years ago the Bishop produced $6,000 within a distance of 30 ft. The Black claim, $11,000 in 15 or 20 ft; the Hayner, $1,400 in 7 or 8 ft.

SACRAMENTO.

ITEM.—Folsom *Telegraph*, Sept. 20: Mr. Dalman's tunnel is completed to 100 ft. Work on the artesian shaft was commenced Monday, and 8 ft of clay has been penetrated, from which some very rich prospects in fine rusty gold have been obtained. The concentrations yielded by washing this clay, are being saved for fire assay; as the gold is too fine and light to admit of it being separated from the heavier substances by ordinary panning. The shaft is now sunk 102 ft, and the drill is at work on some hard substance supposed to be the layer of boulders on the bedrock—should this prove to be the fact, rich developments may be looked for in a short time.

SAN BERNARDINO.

ITEM.—Santa Ana *Herald:* R. A. Maddox, who has been prospecting east of San Bernardino, about 120 miles from this place, and near the Mohave river, returned a few days ago and left with us some very fine specimens of silver ore, assays of which he assured us went up into the hundreds. Some of the specimens shown us carried a large per cent. of copper. The ore is what is termed "milling," and very little galena is to be found in it.

SIERRA.

RICH QUARTZ NEAR FOREST CITY.—Downieville *Messenger*, Sept. 20: A rich strike in quartz has recently been made near Forest City, on the south extension of the Kate Hardy. The lucky miners are Wm. Jillson and others. Rich rock was discovered in their tunnel several weeks ago, but the find was not made public until a few days since. We saw a specimen about the size of one's hand which contained several ounces of gold. The owners have run along the ledge for some distance, and find the rich streak of rock to be about 15 inches wide. They have not yet determined its length along the lode, but the deposit is found equally rich so far as they have run. The old Kate Hardy location was jumped soon after the find was made public. Jillson & Co. say they have many tons of rich rock in sight.

NEVADA.

WASHOE DISTRICT.

OPHIR.—Gold Hill *News*, Sept. 24: On the 2400 level of the incline the station will be so far completed to-day that to-morrow the projected crosscut west will be started. Sinking in the incline has been resumed, and is making usual progress in the same interesting vein formation so frequently noticed. The drift north on the 2300 level is now in 325 ft from the drift east, and is still in vein porphyry carrying streaks of quartz and clay. The raise from this level to meet the joint Mexican winze from the 2100 level is up 12 ft. The east crosscut from the main drift east is now in 64 ft and cutting vein porphyry. On the 2100 level the Hardy vein has been followed 90 ft, the face of the drift in good milling ore.

CALIFORNIA.—The most interesting development in the mine is in connection with the ore body encountered on the 2150 level in running to connect with the Ophir shaft. This vein has been followed by a drift north a distance of 30 ft, and the face is still in good milling ore. To the south it has been traced 20 ft with a like result. Its surroundings are most favorable for containing an ore body, and the likelihood of its making into a more extensive deposit is good.

ALTA.—Sinking the sump has been completed, and the station at the 1850 level is being opened. Water in the Lady Washington drift has decreased materially in its flow, and is not now more than one-fourth of its former quantity.

NORTH BONANZA AND FLOWERY.—On the 300 level the Flowery drifts north and south both show marked improvements since last report, and are cutting the same quality of quartz as the best encountered in the North Bonanza crosscuts. On this level in North Bonanza crosscut No. 2 has encountered a fine stratum of mineral bearing quartz, which is being followed south and promises well. On the 400 level the water has drained down. Both drifts have now been turned into crosscuts. That in North Bonanza has cut through the wall, and one set of timbers have been put in. That in Flowery is up to the wall, and a drill is being sent ahead to look for water. The water is going down rapidly in the bottom of the incline shaft.

CON. VIRGINIA.—The joint west crosscut on the 850 level is making rapid progress through vein porphyry, carrying streaks of quartz; total length, 665 ft. The south lateral drift from this crosscut continues to penetrate vein matter, its face 95 ft from the crosscut. The raise from the 1650 level is up 35 ft, and in vein porphyry. The drift south on the 2150 level to connect with the joint Best & Belcher winze from the 1900 level is in 307 ft, and penetrating a promising formation of vein matter carrying quartz in streaks.

LADY BRYAN.—The incline raise from the 750 level is now up 75 ft, continuing under a smooth clay seam lying 10 ft west of the quartz. The east crosscut on this level has its face in fine quartz, assaying from $3 to $8. This is the same body of quartz cut in the shaft from 40 to 50 ft below the 600 level. It shows a marked improvement with the additional depth gained. The south drift, 600 level, is still in porphyry, with seams of clay. The north drift has its face in quartz, but of low grade.

MEXICAN.—The joint Union crosscut west is making 2 ft per day through a very soft formation of vein matter, which has to be closely timbered, rendering progress slow.

SUTRO TUNNEL.—The north lateral drift is now in a distance of 450 ft in a straight line from the main tunnel. In the south lateral branch the workmen are laying pipe to conduct air from blowers, which are already in place. The exploration drift, 12,000 ft from the face, is in 70 ft in country rock lying between the Occidental lode and the Star ledge.

SIERRA NEVADA.—The crosscut east from the east shaft and on the 2200 level is now in 67 ft, the face in soft porphyry. Preparations are completed to send the water through to the C. & C. shaft as soon as the pipes are ready to convey it. The Union shaft has reached the 2200 level with its full dimensions and the cages are running.

BULLION.—The north drift, 2400 level, is now in 100 ft, and continues in vein matter, carrying veins of promising quartz. The double incline winze from the 2150 level is passing into a softer formation with more quartz, and is nearing the 2250 level, which it will reach during the present week.

SCORPION.—The new shaft is now down 110 ft, the bottom in a formation of hard, stained quartz.

JUSTICE.—Crosscuts, Nos. 1 and 3, on the 1550 level, continue in a lively-looking vein formation, carrying good ore, as also do the lateral drifts both north and south along the western ore chamber. The drift south from the Alta shaft and on the 1650 level is still in a kindly vein formation, carrying some stringers of nice-looking quartz.

GOULD & CURRY.—The east crosscut, joint with Best & Belcher, is now in 1300 ft, and continues in hard porphyry. Sinking at the joint new shaft has been suspended till the pumps are in place; total depth to date 735 ft. Setting the pump-hoist and putting in the big pumping engine. The surface hob is in place.

WARD.—The shaft has passed the 1700 level, the bottom still in birdseye porphyry, from which a heavy flow of water is encountered. East crosscut, 800 level, is in 880 ft, the face in birdseye porphyry, carrying clay seams, in which are pebbles of quartz.

UNION CON.—The Union shaft has connected with the 2300 level, and the cages are running to that depth. The joint Mexican crosscut is now in 137 ft, in an exceedingly soft formation of vein matter, which requires timbering. The joint Mexican winze is down 93 ft, and in a similar formation carrying considerable water.

BELCHER.—Sinking the north incline is making good progress; total depth 60 ft on the slope below the 2860 level. The bottom is dry and in good-looking ground.

[CONTINUED ON PAGE 204.]

Mineral Veins.

[A contribution to the History of Mineral Veins, by JOHN ARTHUR PHILLIPS, Esq., F. G. S., Read April 30th, 1879, before the London Geological Society.]

Certain districts in California are remarkable for their hot springs, and in some of the counties included between the 38th and 40th parallele, and consequently north of the city of San Francisco, sources of thie description are of frequent occurrence, that, when viewed from elevated ground, almost every valley is seen to be more or less occupied by wreaths of steam rising from a flow of highly heated waters.

The vents giving issue to these heated waters usually evolve carbonic acid, which is frequently accompanied by various sulphurous gases; such waters are generally alkaline, containing carbonate and sulphate of sodium, as wsll as, occasionally, alkaline borates. They generally give rise to abundant local incrustatione of either silica or calcite, usually mors or less mixed with free sulphur. These deposits of sinter often extend in nearly horizontal layers, to a considerable distance from orifices from which the waters issue. When watsr is ejected from such vents in the form of steam and spray only, while gases are abundantly given off, and large amounts of sulphur deposited, the aperture becomes a solfatara.

One of the largest known deposits of sulphur in California, occurs in Laks county, a mile beyond the ridge which bounds Borax lake on its northeaetern side, and is many acres in extent.

Thie "Sulphur Bank," as it is called, is composed of a much decomposed volcanic rock, traversed by numerous fissures, from which gases, steam and water, either in the form of epray or of vapor, constantly issue; and upon and throughout the entire mass eulphur has been deposited in such large quantities that, at a short distance, the whole appears to consist of that substance. In the immediate nsighborhood of this solfatara are springe which give off carhonic acid, and of which the waters contain carbonates of sodium, and of ammonium, chloride of sodium, borax, etc.

The eulphur from this locality always contains a small amount of mercury in the form of cinnabar, and the sides of the fissuree in the volcanic rock through which the gases and water make their escape are sometimes coated with gelatinous silica, beneath which is a layer of chalcedony resting upon a stratum of crystalline quartz. This siliceous deposit frequently contains pyrites and a notable percentage of cinnabar, or is stained by a tarry hydro-carbon; while the crystals of quartz often enclose liquid cavities in which the ueual bubbles are distinctly visible.

In the year 1866, I visited Borax lake, and the neighboring sulphur bank in company with Mr. R. Oxland, of Plymouth, who was *the first* to call attention to the presence of cinnabar in in the sulphur of this locality; and in 1868 I published in the *Philosophical Magazine*, a paper advocating the probability of certain mineral deposits having been the result of hydrothermal or solfataric action.

For many years subsequent to my visit this solfatara was worked ae a source of eulphur only; but during these operatione so large an amount of cinnabar was discovered, both in the decomposed basaltic rock and in the cretaceous strata through which it has been erupted, as ultimately to lead to the opening up of the cooler portions of ths sulphur bank as a mercury mine. This has long yielded large quantities of quicksilver, and affords a striking and instructive example of a recently formed mineral deposit resulting from agencies still somswhat actively in operation.

I have specimene of this cinnabar and also a specimen of a thin section of recently formed qnartz from the face of a fissure in the decomposed basaltic rock. Many years since Mr. Oxland found a notable amount of silver in the sinter-like deposit from a hot spring in the county of Colusa, and Prof. Whitnsy previous to 1865, had been shown at Clear Lake some peculiar and interesting specimene of water-worn cinnabar enclosing specks of gold, said to have been found near Sulphur Springs, in the sams county.

These, from being water-worn, and from not having been found *in situ*, had necessarily lost a certain portion of the interest which would otherwise have been attached to them; but through the kindness of Mr. Melville Attwood, of San Francisco, a Fellow of this Society, I was enabled to procure a specimen of cinnabar from Colusa county, which, having been formed upon one of the surfaces of a fissure, has eubsequently become covered by a brilliant deposit of metallic gold.

Steamboat Springs, in the State of Nevada, are eituate near the base of a volcanic hill, esven miles, in a direct line, northweet of Virginia City, and of the famoue eilver minee on ths Comstock lode.

The rock at thie placs ie traversed by several parallel fiseures, which either give issue to heated waters, or eimply throw off clonde of eteam. The moet active group of these *crevices* comprehende five parallel longitudinal openinge extending, nearly in a etraight line, for a dietance exceeding 1,000 yarde, their general direction ie nearly north and eouth, and all of them are included within a zone 200 yards in width. These crsvicee are eometimes filled with boiling water, which overflows in the form of a rivulet; while at others violent ebullition is heard to be taking place a short distance below the surface. These fissures are lined with a siliceous incrustation which is being constantly deposited, whils a central longitudinal opening allows of the escape of gases, steam, and boiling water.

The water is slightly alkaline, and contains carbonate of sodium, sulphate of sodium, common salt, etc. Carbonic acid escapes nearly along the whole line; while sulphnreted hydrogen is evolved and sulphur deposited at certain points. The fissures, which appear to have been snbjected to a series of repeated widenings, such as would result from nnequal movement of their walls, are lined, sometimes to a thickness of several feet, by incruetatione of silica of various degrees of hydration, containing hydrated ferric oxide, and exceptionally, crystale of iron pyrites. This silica exhibits the ribbon-like structurs so frequently observed in mineral veins, and when examined under the microscope is observed to consist of alternate amorphous and crystalline bands, sometimes enclosing druses lined with crystals of quartz.

At a distance of nearly a mile, in a westerly direction, from the locality above described, is a second group of fissures in every respect similar to those at Steamboat Springs, excepting that they are no longer traversed by hot water, although still at various points giving off eteam and carbonic acid. Towards the southern extremity of the principal fiseure of this group, the eiliceous deposit extends considerably beyond the edge of the cleft, and has accumulated to a distance of soms 90 yards ou each eide of the opening.

The silica of this deposit is sometimee chalcedonic and contains nodules of hyalite; by far the larger proportion of it, however, although somewhat friahle, is distinctly crystalline, the crysta's containing numerous liquid-cavities and exhibiting the usual optical and other characteristics of ordinary quartz. Besides oxides of iron and manganese, this quartz contains small quantities of iron and copper pyrites; and in a paper on the Gold Regions of California, published in the *Annales des Mines*, in 1863, Mr. Laur states that he had found it to contain distinct traces of gold. With regard to these deposits, this gentleman remarks that, so far as auriferous quartz veins are concerned, Steamboat Springs appear to place before us a sort of practical verification of the theory which regards a certain class of metalliferous deposits as being produced by mineral waters in the fissures through which they circulate.*

For many years local attention does not appear to have been directed to this portion of the Steamboat valley; but in the year 1878, this older fissure was opened by a tunnel to a depth of 50 feet from the surface, and the veinstone was found so impregnated with cinnabar as to yield large quantities of msrcurial ore of considerable commercial value.† At this depth the temperature was not sufficiently high to cause inconvenience to the workmen, and five samples of the ore subjected to assay gave an average of 2.90% of mercury.

Samples taken from the nearly horizontal flats produced by the overflow of water, yielded, on the contrary, traces only of that metal.

Steamboat Springs thus afford another etriking example of the recent formation of a considerable metalliferous deposit by the agency of hot springs; and I am again, through the kindness of Mr. Attwood, enabled to lay before the Society a specimen of cinnabar from this place.

In further illustration of thie subject, I may mention the deposit of bright red cinnabar in a brecciated vein mass, near the hot springs, at Calistoga, at the foot of Mt. St. Helena. Here fragments of an amorphous silicious rock are cemented together by crystallized quartz, showing distinct lines of accretion, and throughout this minute granules of sulphide of mercury are plentifully disseminated. A hand specimsn and a thin section of this veinstone are on the table.

The great Comstock lode is, as before etated, situated in a volcanic district seven miles southeast of Steamboat Springs, has a nearly similar orientation, and is enclosed between walls either of propylite, or of diorite on the one eide and of propylite on the other. This vein, of which the gangue is chiefly silicious, although calcite is also sometimes present, was firet attacked by the miner in the year 1859, and since that time has yielded silver and gold to the estimated value of above £60,000,000.

The temperature of ths waters issuing from minee worked upon the Comstock lode has always been somewhat high, but it was not until they bad attained a very considsrable depth below the eurfacs that the workmen first became inconvenienced hy the extraordinary heat. At their present greatest depth (2,660 feet) water issues from the rock at a temperature of 157° Fahr. (70° C); and according to Prof. John A. Church, of Ohio, who bas recently publiehed a valuable paper on the heat of ths Cometock mines, at least 4,200,000 tone of water, are now annually pumped from the workinge at a minimum temperature of 135° Fahr.‡

He also estimates that to elevate euch a large volume of water from the mean temperature of the atmoephere to that which it attaine in the mines, would require 47,700 tone of coal. In addition to this, however, 7,859 tone of coal would, he calculatee, bs required to eupply the heat absorbed by the air which pasees along the various ehafts and galleries through which it is diverted for the purposes of ventilation.

It follows, therefore, that to develop the total amount of heat necessary to raise the water and air circulating in these mines from the mean temperature of the atmosphere to that which they respectively attain, 55,560 tone of coal, or 97,700 corde of firewood, would be annually required.

Mr. Church, in his paper, quotes four distinct analyses of waters from the Comstock lode taken at different depths; these, as might have been anticipated, vary eomewhat as to the relative proportions of the various snbstances present; but they contain on an average 42.62 grains of solid matter to the gallon. Of this amount 20.74 grains are calcic sulphate, 12.13 grains carbonate of potassium, 4.85 grains carbonate of sodium, and .66 grains chloride of eodium.

In order to ascertain approximately, to what cxtent the production of the large amount of hsat absorbed by the water may be ascribed to oxidation of sulphur and iron, the Professor first calculates the quantity which would be developed by the oxidation of pyrites equivalent to the calcic sulphate in solution. But having found that this amounts only 1-143d part of that required, he subsequently seeks another solution for the difficulty, and without bringing forward any calculations in support of the hypothesis, attributes this enormous development of heat to the kaolinization of feldspar contained in the adjacent rocks.

If, however, we apply to the kaolinization of feldepar for ths heating of water alone, a somewhat similar line of reasoning to that adopted by Prof. Church regarding the oxidation of pyrites, we shall find that this sourcs of heat is also utterly inadcquate to produce the effect observed.

The average proportiou of alkalies contained in the rocks of the district is 6.40%; while the mean of the published analyses gives 11.30 grains of alkalies in 58,373 grame (U. S. gallon) of mine water. It consequently follows that the 4,200,000 tons of water annually pumped out of the workings must contain 813 tone of alkalies, and that, ae these ars present in the rocks in proportion of 6.40%, the feldspar in 12,703 tons of rock must he annually kaolinized, and the whols of the alkalies removed in the solution.

The amount of rock in which the feldspar has been kaolinized being 12,703 tons, and the number of tons of water pumped out of the mines 4,200,000, it follows that

$$\frac{4,200,000}{12,703} = 330,$$

is ths number of tons of water heated by each ton of altered rock.

In order, thcrefore, that one ton of rock ehould be enabled to heat 330 tons of water only 1° Fahr., and if the epecific heat of theee rocks be taken at .1477, which ie that of blast-furnace slags, it would require to be heated by the kaolinization of its feldspar to a temperature above that of molten gold. Consequently to raise the water 85°, or to a temperature of 135°, at which it issues, the kaolinization of the feldspar in each ton of rock would requirs to elevate it to an extent we are unable to estimate, eince there are no means of ascertaining the specific heat of bodies at such enormously high temperatures. It ie therefore evident that the kaolinization of feldspar is no more than the oxidation of pyrites, an adequate cause to account for the heat of the Cometock lode; and in the present state of our knowledge we cannot regard this phenomenon otherwise than as being a last trace of volcanic activity. Prof. Church adduces the bigh temperature of the waters of Steamboat Springs as a proof that the rocks of this regions arc capable of producing sufficient heat to raise large qnantities of water to the boiling point; but these epringe give rise to an evolution of sulphureted hydrogen and to a deposition of sulphur, which cannot be results of the decomposition of feldspar. It is probable that the Comstock lode and hot eprings in Steamboat valley may have had a somewhat similar origin, hut, in the case of the former, volcanic agencies are no longer actively in operation, while both sulphur and sinter have long since been removed from ths surface by denudation.

Annales des Mines, 1863, p. 423.

†Messrs. Humbert, Mining Engineers, San Francisco.

‡"The Heat of the Comstock Mines," by John A. Cburch, M. E. Presented to the American Institute of Mining Engineers at Chattanooga meeting, May, 1878.

A COMPANY in Westfield, Mass., have, it is said, after much experimenting, perfected a wheel of remarkable cutting qualities, being composed of corundum, the next bardest substance in nature to ths diamond. In a scals of 12, rating the diamond at 12, corundum stands at 11; while emery averages at 8½ in hardness. The difficult problem, attempted by so many, of finding a base strong enough to hold corundum without interfering with its cutting qualities, has, it is thought at last been solved by a happy combination of materiale and an ingenione uee of the procees of vitrification. The cost of the cornndum wheel ie only about 25% more than that of the ordinary emery wheel.

A PATERSON (N.J.) manufacturer within a month has bid on no less than 100 locomotives, which ie the largest number he has eeen proposale for eince the panic, and he has specificatione on hand for at least 50 more. At the Rogers Works they have all they can do and are far behind with their ordere. If they had ehop room they could employ 1,000 more men than they now have. The Danforth Works are also driven to their utmoet capacity, with a prospect that they will be further pnshed bsfore the end of another month.

Utilization of Furnace Gases.

Researches have been undertaken from time to time to ascertain the composition of gas collected in high-temperature furnaces employed in working iron, and in many metallurgical operations. The matter has cxcited the attention of the French Academy of Sciencee, before which L. Cailletet pressuted the matter some yeare ago. The matter is fully treated in the *Annales des Mines*, Vol. XIV., p. 559, and reappears with renewed interest in view of the late rapid developments in the direction of the utilization of sulphides as fuel in the Hollway process, and the use of gas in metallurgical operations. M. Cailletet based hie researches upon the remarkable labors of St. Claire Deville on the eubjsct of dissociation, which admitted of the interpretation of a large number of metallurgical phenomena until then inexplicable. Deville showed that it is necessary to quickly cool the gas at the moment of collection in the hearth, to avoid combination of dissociated slements.

This is effected by collecting ths gas in a thin copper tube, about 0.02 inch diameter, which is connected within one of the branches of a larger U-tube of the same metal. A rapid current of cold water courses through the annular space between the two tubes. One end of the straight tube pierces the walle of the U-tubs in the curved part, and is connected to an aspirator. The composition of the gases collected in this apparatus entirely differs from ths results given by Ebelmen, who slowly aspirated the gases without regard to the recombination of their diesociated elements. Gas collected as described, on the eole of a refining furnace near the grate, contained per cent:

Oxygen	13.15
Carbonic oxide	3.31
Carbonic acid	1.04
Nitrogen (by difference)	82.50

The aspirator-flask was filled with fumes of finely divided carbon, the color of which (by transmission) is exactly complementary to that of the flame of carbonic oxids. The gases issuing from these furnaces are usually directed beneath the boilers. By contact with the sides of the passagss, the gases are rapidly cooled, and they are completely extinguished after passing a distance of 15 to 20 yards. Analysis shows that they contain, per cent:

Oxygen	7.65
Carbonic oxide	3.21
Carbonic acid	7.42
Nitrogen (by difference)	81.72

The quantity of oxygen then has diminishsd nearly one-half, not by burning the carbonic oxide, the proportion of which is but elightly altered, but by consuming the finely-divided carbon. The quick cooling prevents this reaction.

M. Cailletet believes it will be interesting to learn whether it is not possible to utilize thess gases that are regarded as waste, and has recently instituted, in his worke at St. Mark, some expsriments which havs shown that the gases are easily relighted by passing them over a hearth, at the same time reducing their velocity. The heat developed attaine a clear red, and may be employed in brick or lime kilns, or in the tempering of eheet-iron and wirs. Hs concludee from his sxperiments that the gases issuing from metallurgical furnacee still contain, even after their passage under steam hoilers, an important quantity of combustible principles, that they are easily re-ignited and nearly completely burnt.

PATINAGE OF LOCOMOTIVES.—Sig. P. Oppizzi finds that the diminutions of resistancs which are not followed by an equal reduction in the motive force produce an acceleration in the rotative movement of the wheels, which cannot bs wholly transformed into an acceleration of the locomotive, and therefore canses slipping. He hae given eome experimental formnlæ which, although not so complete as desirable, show the importance of a more careful regard to the relation between the motive force and the adhesion of the wheels. This relation has been too much overlooked by engineers, who have sought to give increased pressure to the steam, and to work it under too great expansion in order to obtain some ideal economical advantage.—*Il Politecnico.*

NEWS has reached Rico that on Red Mountain, about eight miles from the npper Rio San Miguel and seven miles from Ouray, and about the eame distance from Silverton, carbonates have come to the light of day. They have been assayed, and run from 40 to 100 ounces to the ton.

AN exteneive vein of iron ore, carrying 60% of mineral has been found near Godfrey Station on the Kansae Pacific. A fine vein of coal ie being developed in the same vicinity by the Union Pacific Company.

A CONTRACT for 100 iron bridgee for Coeta Rica, South America, for the road from Punta Arenas to San Joee, and thence to Port Limon, has been awarded to Mr. Charles Snyder, of Patereon, N.J.

PROF. HAYDEN and othsrs eetimate that from 50,000 to 65,000 equare miles of Montana'e area are underlaid with coal. Several of the measuree are yielding an excellsnt quality of fuel.

The Engineer.

Pneumatic System of Raising Minerals from Mines.

A new system of raising coal has been introduced in the Saoac-et-Loire district of the central coal fields of Fraace, at the Hottiaguer shaft of the Epinac collieries. The pit is now 656 yards in depth, it is iatended to be suuk to the depth of 1,093 yards. The pneumatio tube is 63 iaches iu diameter, 659 yards in hight, and its weight is 345 tons, being coastructed of wrought iron (5-16 inch platcs) in lengths of 4 feet 3 iaches bolted together. Ths joints are made with india-rnbber rings ane-qnarter inch thick. Tho tube was completed in July, 1876, aad has heeu in operation siace that time to the preseat. That part of the tuhe in whicb doors are placed is of cast iron. At each loading and discharging place thore are three doors in the tube corresponding to the hight of three coal tabs apart, miae tubs are placed one above tho other in the cage within tho tube. When the cage is in tho first position, tho first, fourth aad seveath tubs are opposito to the doors; whsu lowered the hight of a tuh to the second position the second, fifth and eighth tnbs are opposite to the doors, and when lowered again the hight of a tub to the third position, the third, sixth and nintb tubs are opposite to the doors. It will thus he seen that a train of nine tuhs are placed onc above the other in the cage. The latter has two pistons attached to it, one at the top another at thc bottom. These pistons work in the 63-inch tuho extending the whole depth of the shaft, the cage being raised or lowered hy making a partial vacuum abovc the piston and cage, for which air pumps are provided.

The arraagement may consist of only one tnbe, as in the present instauce, in which one cage alternately descends and riees with the load, or it may cousist of two tuhes, in one of which a train of empty tnbs descend at the same time that a train of full ones is raised in the other. When two tubes are adopted, the air pumped from that where the full train is beiag raised is delivered into the other tube where the empty one is descending.

In the Hottinguer shaft the air of the mine filling the lower part of the tuhe as the cage risee is blown out at the surface through an escape pipe ae the cage descends, and to some extent assists the ventilation. The cage is kept in any position hy etops or keys worked from the outside, and may be lowered or raised at the stations to hring the tubs opposite to the doors. This ie done hy admitting air over it, or by opening a communication hetween the tuhe above the cage and the air-pumps. The cage is stopped gradually at the ends of its travel by the cushion of air at the closed ends of the tube. To allow of stopping at intermediate levels, and also to guard against accident, a slidiag partition is fitted in the tnbe immediately below each station, excepting that at the bottom, which is open so long as the cage ie below, but ie closed after it has passed.

The position of the cage with its pistons during the ascent or descent is indicated by several harometers placed in the engine-honse, showing the pressure of the air within the tuhe at points 109 yards apart. As the pressnre below the cage is equal to atmospheric pressure, whilst a partial vacunm is made above it, the barometers indicate at once whether the cage is above or helow the point at which each one ie put in communication with the tuhe.

To make the pistons air-tight, even at the doors, where the tuhe ie not cylindrical, the piston above the cage is made in two parts or planes, with a space hetween them greater than the hight of a door, but less than the distance between the two doors. The two pistons are packed with leather. The tube ie lubricated with soap and water mixed with oil.

The air cylindsrs are two, 63 inches in diameter, 6 feet stroke, driven by an engine formerly used in winding. This machinery is only temporary; larger engines are heing constructed. The weight of coal raised in each lift is 3 tons; the gross weight of the train laden is 6 tons. The vacnum made within the tuhe is equal to a column of mercury 9.4 to 9.8 inches in hight. The speed of the train is about 19½ feet per secoud; friction is slight, and the leakage of air paet the piston is very little.

The work performed in lifting the coal on the pneumatic system is stated to be 28% of the indicated horse-power of the engine. With the same engine when used for winding by ropes, the work did not amount to more than 16%. Engines are being constructed of 730-horse power to work the air-pumps and exhaust from the tube. With these, 4½ tons of coal will be raised at each lift; the gross weight of thc laden train will be 9½ tons. The consumption of coal for the boilere of the new engines, lifting from a depth of 1,093 yards, is estimated to be 10% of the coal raised if ropes were used, but with the pneumatic system and single tube only 3%. This would give a lessened consumptions of 157 pounds of coal per ton to be raised.

The new engines and air-pumpe may he utilized, it is snggested, in producing a partial vacuum in the workings of the mine hy closing all entrances to it when the workmen are on the surface. Fire-damp may thus he more thoroughly drawn out than it is when there is a considerahle fall in the atmospheric pressure as indicated by the harometer. The mine may afterwards he cleared and pure air put into circulation before work is again commenced.

Useful Information.

Fusible Metals.

Of mixtures of metals which become liquid at temperatures at or below the boiling point of water, there are several known, some of which are placed in convsnient order, as follaws:

1. D'Arcet's: Bismuth, 8; lsad, 5; tin, 3 parts. This melts helow 212° Fah.

2. Walker's: Bismuth, 8; tin, 4; lead, 5; aatimony, 1 part. These metals shoald he repeatedly melted and poured iato drops, until tbsy can bs well mixed, previous to fusing them together.

3. Onioa's: Lead, 3; tiu 2; bismuth, 5 parts. Melts at 197°-Fah.

4. If, to the latter, after reiuoving it from the fire, one part of warm quicksilver he added, it will remain liquid at 170° Fah., and become a firm solid only at 140° Fah.

5. Another: Bismuth 2; lead, 5; tin, 3 parts. Mslts ia boiling water.

Nos. 1, 2, 3 and 5, aro used to make toy spoons, to surprise children hy their molting in hot liquors. A little mercury (as in 4) may be added to lower their melting points.

Nos. 1 and 2 are specially adapted for making electrotypo molds. French cliche molds are made with the alloy No. 2. These alloys are also used to form pencils for writing, also as metal baths iu the laboratory, or for soft soldering joints.—*Scientific American.*

Varnish from Yellow Amber.—The lacquers made from these materials are remarkable for their hardnese and the ease with which they acquire a brilliant polish, but the greatest care must be taken in their manufacture, in order to prevent their becoming black or being covered with greenish spots. Starting from the conviction that these imperfections are due to oxidation during the process of manufacture, Mesers. E. Schrader and O. Dumeke devised the following apparatus: A cylindrical boiler, made of iron and copper, is put into masonry in an inclined position. The resinoue materials are melted hy means of superheated steam, which expels the air from the vessel, thue avoiding the danger of oxidation. When melted the material is forced hy steam pressure out of the hoiler through a tube in ite lower part. The temperature is kept well in hand, eo that there is no danger of decomposition. The top of the apparatue is provided with a manhole, a safety-valve, a pipe to carry off the volatile portions of the rosin, and a stirrer passes through it. The clear material is conducted in pipes, which have vents for the escape of gases. The value of the apparatus consists in the security it offers for melting large quantities with certainty of success, and in the protection it affords to the workmen.

Determination of Silver in Galena.—The Volhard principle of the direct determination of silver in galena is ae followe: From 2 to 5 grammes of the galena, according to its supposed richness in silver, are very finely ground and intimately mixed in a porcelain mortar with from 3 to 4 times its weight of a flux composed of equal parts of soda and saltpeter, placed in a porcelain crucible, covered, and heated over a burner to thorough fusion, when the mixture is well stirred with a glass rod. It is then let cool, and placed in an evaporating dish partly filled with water, in which the melted matter is softened, dissolved out of the cricible into the dish, which is then heated, and the watery eolution is filtered into a flask. The residue on the filter, after being well washed, is rinsed hack into the dish, very dilute nitric acid is added, and the whole evaporated to dryness. The dry residue is taken up in water acidulated with nitric acid, heated, and filtered into the same flask in which is the aqueous solution. The residue is washed with hot water, the filtrate is allowed to cool in the flask, ferric sulphate or iron alum is added, and the liqnid is titrated.—*C. A. M. Balling, in Oest. Zeitschrift Berg. u. Hutten.*

Painting Flowers upon Mirrors.—An art lately revived in Rome is the old Venetian art of painting upon mirrore. Birds and butterflies are also often added, and the effect of the glass underneath, especially when thie is thick and beveled, is to make them appear as if suspended in the air. The design must be traced from natural flowere with a lithographic pencil, and painted in oils with peculiar care; for nothing can he more unlovely when badly done with mnddy ill-assorted colors. These mirrore are usually framed in carved ebony or ehonized frames in the cinque cento style, another fashion recently revived.

Zinc-plate Film.—Husnik'e plan for causing a chromated gelatine film to adhere to a zinc plate is to coat the zinc plate with a solution of three grammes of chromic acid in one thousand grammes of water. When the acid has acted upon the zinc, wash off the eolution, and first coat the plate with plain gelatine, and then with the chromated gelatine. Treated in this way, the film is said to adhere very firmly to the zinc; but it must he kept dry before being used, otherwise a chemical reaotion ie apt to set in, by which the printing surface would be spotted.

Printing Labels an Bottles.—Tbe Londoa *Chemist and Druggist* refers to a method of laheling bottles by a process invented in Germany. The labels are printed on the bottles themselves by a simple operatiou, neither paper nor mncilage being required. Thero is no trimming ar moistening of labels. The bottles are placed in the hands of a printer, who dslivsrs them at the rate of 1,000 a day, laheled in a neat aad finished styls. The process is an actual printing, not an stching ar a sand-hlast. The labels can hs scraped off witb a kuife, through they are aot affected hy water. They are not so opaque as paper, and heautiful effects can hs obtaiusd hy nsing a white gronnd on hottles filled witb colorsd substances. Bottlee can hs laheled whea full as easily as whsn empty, and the address of the sender can be attached by this process to proprietary articles. Laholing hy thia method is said to cost no more thaa by that now in use.

New Application of Paper.—In the Portsmouth dry-dock a vessel was hauled up for repairs, and it was observed that a portion of the hull, to which a piece of paper adhored, was free from grass and mussels. Experiments were instituted, which led to an application for a patent for paper sheathing. As it can easily he impregnated witb poison, it will probahly act as a protection against horers as well as against ordinary fouling.—*Fortschr. der Zeit.*

Colored Pencils.—L. von Faher makes pencile for writing upon glass, porcelain, metal, etc., as follows: Black—10 parts of lamp-hlack, 40 parts white wax, 10 parts tallow. White—40 parts white lead, 20 parts wax, 10 parte tallow. Blue—ten parts Berlin hlue, 20 parts wax, 10 parts tallow. Dark hlue—15 parts Berlin hlue, 5 parts gum arabic, 10 parts tallow. Yellow—10 parts chrome yellow, 20 parts wax, 10 parts tallow.—*Dingler's Journal.*

Improved Vulcanized Rubber.—C. Schwanitz, Jr., of Berlin, uses glycerine in the preparation of vulcanized rubber, in order to secure it from injury by fats and oils. He also passes the finished mass between warmed rolls, in a glycerine bath, in which it ie exnosed to steam, under a pressure of two or more atmospheres.

Good Health.

Work and Worry.

"Studying too hard," "over-worked," are charged with many deaths, but not wisely. Trouble kills. It is a very rare thing for a man to think himself to death, nnless connected with something more or lese distressing. Study is a blise to the student—he had rather etudy than eat; the sound of the dinner hell is always unwelcome. The greatest etudents in moral philosophy, and divinity, and physics (not physic), have lived long, and worked efficiently to fonrscore and beyond. Thought is to the brain what exercise is to the physical constitution; it keeps the channels of life clear, the hlood-vessels unobstructed, and the vital fluid courses along them, distrihuting newness of life and vigor of action to the latest hour of existence, while the want of thought hrings stagnation to the circulation, and causes man to drivel and sleep in old age—dead as to everything except to eating, and dozing, and hovering over the fire. Men may study ever so hard, and after 50 may study with comfort and advantage for 5, 10 and 15 hours, day after day; and, if the etndies are pleasurahle, they promote the general well-being of the system, both phyeical and mental, if only ahundant sleep is had, with a regular supply of simple and nourishing food, sitting down to meals in pleasant moods, and allowing a good half-hour hefore etudy is resumed. Many of our literary men die prematurely, not from over-stndy, but from depressing mental states and irregular or excessive eating and drinking.

It is haste, rather than steady, continuous lahor of hody or mind, which hurries multitudes to their graves scoree of years hefore their time. With all haste there is impatience, solicitude, worry. The fastest trains, the fleetest steamers, the first trotters, everywhere command premiums. To eave time, "night boats" are patronized, breakfast ie bolted, the morning paper read on the cars, and everything is done under high pressure. But, just as certainly as a hank halance, rapidly drawn upon, melts away hefore it was expected, so does this reserve of vital stamina disappear—is used up—and the man diee in his prime, at the very moment, often, when he had just got into a position where he could afford to enjoy himself. —*Hall's Journal of Health.*

To Prevent Boils.—A very simple remedy is made known hy Dr. Sieven, in a St. Petersburg journal, for preventing the development of boils. He states that if the skin be snperficially scraped with a small knife, so that a drop or two of blood may be pressed through the epidermis as soon as the peculiar stabbing or pricking sensation and slight induration announce the commencement of the boil, it will not he further developed.

Suggestions for the Sick-Room.

In preparing a meal for any one whose appetite is delicate, it should be made to look as temptiug as possible. Tho tray should he covered with ths whitest napkin, and the silvsr, glass, aud china should shius with cleanliness. Thers should not be too great a variety of viands, and but a very small portion of each oue. Nothing more quickly disgusts a feehle appetite than a large qaantity of food presented at oae time.

The patient shauld never he consnlted beforehand as to what he will sat or what he will drink. If he asks for anything, give it to him, with the doctor's permission; otherwise, prepare aomething ho is known to like and offer it without previous commeat. One of the chief offices of a good nnrse is to think for her patient. Hie slightest want shauld he anticipated aud gratified hefore he has had time ta express it. Quick observation will enable her to detect the first symptom of worry and exoitemeat and to remove the cause. Au invalid should never he teased with the exertion of making a decision. Whetber the room is too hot or too cold; whether chicken broth, heef tea, or gruel is hest for his luncheon, and all similar matters, are questions which shonld be decided without appealiag to him.

Household troubles should he kept as far as possible from the sick-room. Squahhles of children or servaats never should find an echo tbere.

In the event of some calamity occurring, of which it is absolutely necessary the sufferer should be informed, the ill newe shonld he hroken as geutly as possible, and every soothing device employed to help him to hear the shock.

Above all, an invalid, or even a person apparently convalcscent, ehould be saved from his friends. One garruloue acquaintance admitted for half an hour will undo the good done by a week of tender nursing. Whoever ie the responsible person in charge should know how much her patient can bear; she should keep a careful watch on visitors of whose discretion she is not certain, and the moment she perceivee it to he necessary politely but firmly dismise them.

She must carry out implicitly the doctor's directions, particularly those regarding medicine and diet. Strict ohedience to hie orders, a faithful, diligent, painstaking followiag of his instructions will insnre to the sufferer the hest results from his skill, and bring order, method and regularity into domestic nursing. —*Scribner for September.*

Fungi in Man.—The human ear is sometimes attacked by a disease which shows itself in the form of a running sore; in many cases the tympannm is destroyed and hearing loet before the nature of the malady is discovered. The disease is dne to the growth of a microscopic plant or fnngus of the *Aspergillus* family. It especially thrives when, from any canse, the secretion of the wax in the ear is etopped or hindered. The microscope is a valuable assistant in the discovery of this fungus. Consumption, the most disastrous malady that afflicts humanity, is now said to be caused hy a yeast plant that flourishes in the blood. The presence of this fungus in the blood is readily ehown by the microscope, and now forms the subject of careful study among physicians. Ephraim Cutter, M. D., of Boston, Mass., has devoted much labor to this subject, and, we understand, hae recently prodnced micro-photographs of the fungus with Tolles' remarkahle one-seventy-fifth objective. We believe that Dr. James H. Salisbnry, of Cleveland, Ohio, was among the earliest to detect and describe this curious yeast plant of the hlood.—*Scientific American.*

Erysipelas from Sewer-Gas.—It has been proved beyond a douht by observations in England that erysipelas is often caused by the entrance of sewer-gas into houses and hospitals. The London *Sanitary Record* remarks that "there is now no more douht that erysipelas is originated hy sewer-gas than that typhoid fever is due more often than not to impure water." Several cases at Lincoln and Manchester are cited. At the latter city many cases of erysipelas and pyæmia were traced to the hospital sewer-gas. The *Record* condemns lead soil pipes, and saye: "We have known cases of ths escape of sewer-gas through a 'rat-eaten' (or gas-corroded, which ie far more common), lead pipe, in spite of good arrangements for its ventilation. Let the pipes he of *iron*, and well ventilated, and all mischief from this source may really he defied."

Arsenic in Water Colors.—According to the *Chemiker-Zeitung*, M. Fleck, in searching into the causes of the death of a young engineer, fonnd in the corpse remarkahle quantities of arsenic, the origin of which he attrihuted to the water colors which the deceased had heen in the habit of using; for, on an analysis, he found that a specimen of sepia contained 2.08% of arsenious acid, one of terra di Sienna 3.14%, and one of red brown 3.15%. The deceased engineer having been in the habit of drawing his brush, charged with the color, through his lips, it is not impossible that the arsenical colors were absorhed by degrees in the salivs.

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The Week.

News from the various mining localities of the State indicate a strong revival of the mining business, evidenced by renewed activity in the development and working of old and new mines. The quartz mines are busy turning out good paying ore as fast, if not faster, than it can be handled. Active preparations are being made to open up placers and hydraulic mines. The Big Bar, in Butte county, has developed a rich-paying streak of gravel along the bedrock, which will be mined hereafter by drifting, instead of the hydraulic process. Mono county is still developing its rich mines, and extra exertions appear to be made to make the yield second to none, which the appearances seem to justify. Nevada county is developing rich quartz finds, and recent developments at Little Grass Valley have disclosed a promising gravel mine, which is to be worked on a large scale.

San Bernardino nor Los Angeles county do not seem willing to be left behind in the golden harvest, and are both finding silver with some traces of gold. The Sitka quartz mines at Alaska are assuming good paying qualities, and new ledges are being discovered every day according to reports. Active preparations are made in Oregon, for the full working of mines, which, heretofore, have been only slightly worked at intervals.

Carbonates carrying very rich assays of silver are continually being unearthed in Colorado, and the already developed mines are exceeding the expectations of their owners. In Grant county, New Mexico, some rich ledges have been discovered in the mountains to the north and east of the Mimbres. New and rich discoveries of ruby and native silver have been made in Altnras, Idaho. Every where in the Rocky mountain region, from Alaska to Mexico the prospector has been encouraged and rewarded by unlooked-for strikes of precious minerale.

The Argentine Goverment has refused an American offer of $6,000,000 for the Tucuman Railway.

Defects in U. S. Mining Laws.

Questions Submitted by the Public Land Commission.

By an Act of Congress, approved March 9th, 1879, a "Public Land Commission" was organized, the duty of which is to report to Congress within one year of that date: *First*, a codification of the present laws relating to the survey and disposition of the public domain; *Second*, a system and standard of classification of public lands, as arable, irrigable, timber, pasturage, swamp, coal, mineral lands, and such other classes as may be deemed proper, having a due regard to humidity of climate, supply of water for irrigation, and other physical characteristics; *Third*, a system of land parcelling, surveys adapted to the economic uses of the several classes of land; and *Fourth*, such recommendations as they may deem wise in relation to the best method of disposing of the public lands of the western portion of the United States to actual settlers.

The Commission met in this city this week at the Surveyor-General's office, all present except Major Thos. Donaldson, of the Smithsonian Institute. The other members are: Gen. J. A. Williamson, Commissioner of the General Land Office at Washington, and Chairman of the Commission; Clarence King, Chief of the Geological Survey; Major T. W. Powell, of the same Survey; Alexander T. Brittan, President of the Land Attorney's Association of Washington.

Nevada, Utah and Colorado, have already been visited by the Commissioners, who after finishing their work in California will go to Oregon, Washington Territory and Arizona.

The Commissioners divided up as follows for making a tour of inspection among California Land Offices: Major Powell, assisted by Captain Dutton, and accompanied by a stenographer will go through the San Joaquin valley as far south as Los Angeles. General Williamson and Mr. Brittan will journey north to Shasta, while Clarence King will inspect the quicksilver and gold mines located in the section of country south of San Jose. Returning, the Commissioners will meet in the Surveyor-General's office on the 4th of October, and report the result of their observations.

Aside from the general questions and those relating to agriculture, timber resources, etc., the following questions propounded by the Commissioners will be of interest to the mining community, and all persons interested are asked to answer them by letter directed to the Public Land Commission, P. O. Box 585, Washington, D. C.:

Lode Claims.

1. What experience have you had, and where, and in what capacity, in the business of mining, mine surveying, and mine litigation.

2. What defects, if any, in the United States laws, their operation and administration as applied to lode claims; do you know, either from your own experience or from observation?

3. What is your opinion as to the present official practice of filing surveys of lode claims which overlap on the surface? State instances and inferences in full.

4. What do you understand to be the top or apex of a vein or lode? Can or cannot the top or apex, the course and angle or direction of the dip always be determined in the early workings of the veins or lodes?

5. If no, are the intended rights of a discoverer properly defined and protected by the locating of a claim under the existing laws, of which the foregoing terms are essential parts?

6. Within your experience and knowledge, has or has not litigation and injustice grown out of the impossibility of determining the above points?

7. Have you known of two seams, parallel or otherwise, of the same outcrop, being located by different parties and giving rise to contest?

8. If yes, in such a contest have you known of the original locator being cut off in depth by the later locator?

9. Are or are not the outcrops of lodes often wider than the legal width of claims, whether as defined by the United States, State, Territorial, or local district regulation?

10. Do or do not outcrops of narrow lodes sometimes so deviate from a straight line as to pass beyond the side lines of claims?

11. Does the practice under the law of permitting lode locations of alleged lodes, on non-mineral ground, work to the advantage or disadvantage of the discoverers of true lodes?

12. If A, on the outcrop of a true lode, makes a location and B locates a parallel claim outside the side lines of A's tract but over the dip of A's lode—B's subsequent location being on an alleged lode but really on barren ground—can B, who has discovered nothing, cloud the title of A, the discoverer of a true lode, and put him to the cost and inconvenience of an expensive litigation? State instances and give particulars of the same.

13. Are or are not a large majority of the discoverers of rich veins, or their assigns, often burdened with costly litigation to defend their rights from subsequent locators in their immediate neighborhood? and in such cases is or is not the legal attack most often directed to the portion of the dip of the lode which has passed beyond the exterior lines of the surface tract?

14. In view of the known variety and complexity of mineral deposits in rock in place, is it, or is it not, in your judgment, possible to retain in the United States mineral laws a provision by which locators can follow the dip of their claims outside their side lines without provoking litigation?

15. Have you ever taken part in organizing a local mining district? If so, state fully where it was done; by how many parties, and whether necessarily actual miners or citizens? What officers were elected, and their duties? What books of record provided, and their object?

16. State generally the mode of originally taking up and locating a mineral claim under mining customs and the effect of a record of such location.

17. Is that record capable of subsequent amendment? and if so, how?

18. Within your knowledge, have mining titles been disturbed, or litigated, through fraudulent manipulation or destruction of these records? If so, what security is there against such frauds?

19. Calling your attention to the fact that a copy of the certificate of location, as certified by the local mining recorder, is the sole basis of the paper title for a mining claim, under existing law, and that compliance with the varying customs of innumerable mining districts constitutes the preliminary acts upon such claims—state, whether in your opinion, all mining district laws, customs and records could advantageously be abolished as to future locations, and the initiation of record title be placed exclusively with the United States land officers?

20. Calling your attention to the fact that under present laws an adverse claim, in proper form and seasonably filed, suspends the administration of the mineral laws by the United States land officers, and transfers the jurisdiction to the courts of law, both State and United States—please state whether, in your opinion, the adjustment of controversies concerning mineral lands prior to issue of patent should not be left absolutely to the United States land officers, in the same manner as contests under all other land laws?

21. If you consider it desirable to retain the leading features of the United States mining laws, what amendments, if any, would you suggest to remedy any defects which your experience or observation has detected? If, on the contrary, you believe that the practice of following the dip beyond the side line of a claim is incompatible with satisfactory administration, what method of location would you suggest?

22. Ought there not to be a limitation as to a possessory title under the mineral laws? and should not locators be compelled, on penalty of forfeiture, to acquire the title by purchase from the Government within some reasonable time? If so, what would be your idea of the time?

Placer Claims.

1. What proportion of the lands in your section is mineral, and what is the nature of the mineral deposits?

2. Are you familiar with the practical operations of the United States mining laws? If so, state how and to what extent.

3. From your personal experience, please state the time and expense of procuring a mineral title, whether possessory or by patent—both with and without contest.

4. State your knowledge of the experience of other parties upon the same points.

5. Within your practical experience, are the existing mining laws as to placer claims defective or otherwise?

6. If defective, state in what particulars; having especial reference to the facts of original location under local customs or laws; the shape and size of such claims; their occupancy and development; the opportunities for consolidating two or more claims in one person by purchase; what evidence of the chain of title is required; what use is made of such claims other than actual working, if any; and what is the general character of the litigation relative to these placer claims?

7. Within your knowledge, are titles obtained under the placer law for non-mineral lands, and if so, state instances.

8. Within your knowledge, has the placer law been used to obtain titles to lode claims? If so, state instances.

9. Do you know valuable placer lands which are unworked because the outlets are controlled by claimants under other than mineral titles? If so, state instances.

Mexican Debt.—It appears from a statement in the *Trait d'Union* that the total debt of Mexico is only $59,999,300, being $6.20 per capita of the population, the lowest of all the American governments except Columbia, which is $5.33. A writer in *Las Dos Republicas* finds consolation in this fact, and finds that the United States has a debt of $63 per capita; hence we are ten times worse off than Mexico. The brilliant future of Mexico would be assured *if* it had peace and order, etc. But when her people will cease their useless strife no man can foretell. The small debt of Mexico is probably kept small by inability to borrow. There is hardly an individual in the United States that could not pay his per capita share of the national debt, while it would require a multitude to pay the $6.20 allotted to each. Capacity and ability is what makes the difference.

Gold bars and eagles to the value of £100,000 will be shipped to the United States Saturday from England.

Alloys of Silver with Embrittling Metals.

The result of a series of experiments made at the United States Mint, in Philadelphia, by Alexander E. Outerbridge, Jr., has lately been published in the *Journal of the Franklin Institute*. The experiments were undertaken principally to save loss of metal in the "toughening" process, and with a broader view of furnishing reliable data as to the relatively injurious effects upon refined silver of small but known percentages of such base metals as were supposed to impair its good qualities. It is a fact well known to metallurgists that the presence of certain base metals in refined gold and silver, even in small percentages, exercises such an injurious effect in regard to ductility, hardness, etc., as to render the metal totally unfit for coin or the industrial arts, thereby necessitating the removal of these impurities by oxidizing fluxes or other equivalent means.

It is also well known that during the process of removing these impurities ("toughening") an inevitable, though variable, loss occurs, which is traced to three causes:

1. To the formation of volatile compounds of gold or silver with the baser metals.

2. To the violent action on the surface of the metal during the decomposition of the oxidizing agent, thereby causing minute particles of the molten metal to be sprayed from the surface.

3. To the upward current of air and flame sweeping over the surface of the molten metal in the pot drawing into the flue the vaporized metal and the fine spray.

These vapors are carried out of the chimney where they partially fall, in a sort of fine rain, upon the roof of the Mint and adjoining buildings, and a larger portion is carried into free space and lost. Unsuccessful attempts have been made to recover this metal thus dissipated by means of shelves and other devices arranged in the flue, but their use tended to impair the draught in the wind furnace.

It was to overcome these difficulties that Mr. Outerbridge devised an apparatus to prevent the metallic vapors and gases arising from the melting pot from escaping into the flue at all by drawing them off into a suitable condensing chamber. The trial tests were commenced and continued from time to time until they were suspended owing to the unprecedented increase in the regular work, consequent upon the passage of the Bland Silver bill. So far, as completed, however, the tests include the preparation and subsequent examination, analysis and refining of alloys of silver with arsenic, antimony, bismuth and lead.

A brief recapitulation of the results obtained in this work, which are regarded only as preliminary and therefore capable of possible modification on more extended investigation, are as follows:

It was ascertained that the arsenical silver alloy, contrary to the general expectation, was the least volatilizing in silver in comparison with more refractory metals, and that the alloy might contain one per cent. of arsenic (silver 990, arsenic 10) without materially injuring the ductility; but if carried to 2½%, the mixture was quite brittle.

The antimonic-silver alloy caused a very much greater loss of silver, and yet its brittling effect was much less than had been anticipated.

Bismuth was the most brittling, and in this experiment proved by far the most difficult to remove by fluxes that operated effectively upon the two former.

Lead caused a greater loss than any of the former with the exception of antimony. The brittleness of those was crystalline, of this rather crumbly or amorphous, yet three parts in a thousand did not spoil the ductility.

It is hoped that the trials may lead the way to future investigations, which are much needed to afford a complete elucidation of the difficulties that beset the manipulator in the precious metals, whether in the preparation of coin metal, ornamental ware or gold leaf, in the want of ductility of the alloys.

In a letter concerning the report of these experiments, Mr. Wm. E. DuBois, chief assayer of the Mint, says: "I took a particular interest in this investigation for two reasons: First, I was sure that we knew too little practically about the effect of a small presence of such metals as arsenic, lead, etc. That is, we depended too much upon supposition, as to the extent or the degree in which they were injurious to the precious metals for coining purposes. Arsenic, antimony, bismuth and lead are the chief enemies that trouble the camp of the silver miner and refiner. Nor are they less dreaded at the Mint, since a small proportion of either will make our gold or silver refractory, brittle, crystalline or crumbly. We must have ductile metal to work with. Hence these experiments have for us a two-fold interest, as hitherto there have been no trials that we know of, at home or abroad, on any considerable scale, or in proper bulk."

About 1,000 ounces of silver was adopted as the normal weight of refined metal to each experimental melt.

Zulu Mining District.—This is the name of a new mining camp lately discovered in Provo, Utah. The quartz from the Zulu ledge assays, in gold and silver, $1,260.50 per ton. Many claims are staked off and being surveyed, a new town is laid out, and expectations run high.

Silver Mines of Batopilas, Mexico.

Aronnd the small town of Batopilas, in ths sonthwestern corner of the State nf Chihuahna, Msxicn, is a group of silver-bearing veins, which sre among the most interesting deposits of the preoioue metale known. The town itself is a dilapidated Mexican mountain town, consisting principally of adobe houses very mnch out of repair, which, with the ruins visible at s very step, wonld be unlikely to strike the observer as being the center of great wealth and productiveness at tho tims of Humboldt's visit; yet there is ampls evidence of its being entitled to a prominent place on the list of rich mineral centere.

Mr. H. A. Stearns, of Batopilas, now on a visit to San Francisco, has favored ns with some interesting information concerning thie district, which we lay before our readers. The town is about 400 milee from the coast, and may be reaohed from either Guaymas or Mazatlan, by way of Alamoe or El Fuerte, which places are its base of supplies, being 208 miles from the former and 130 from the latter. From the coast to these towne the roads are good and practicable for wsgons, thongh that meane of conveyance is little nsed. After passing Alamos and El Fuerte, the western base of the Sierra Madre is eoon reached, and the roads dwindle down to mulo trails, steep and rugged, bnt over which all machinery must find its way to the interior.

Batopilas ie sitnated in the very heart of the Sierra Madre, in a deep "barranca," or gorge, throngh which flows the river of the same name, joining ths Fuerte river and thence to the Pacific ocean. High mountaine surround the town on all sides, rising from the banks of the river to an elevation varying from 2,000 to 4,000 feet above the bsd of the stream, barely leaving room for the town sits. Ths old town was destroyed some years ago by one of the freshets peculiar to the river during the rainy season, from July to October. From the loftier mountaius on the northwesteru side run a number of deep ravines, which enter the river nearly at right angles, giving shape to the lofty mountain spurs known as the "Hill of Animes," "Hill of Escritorio," etc. The "Animas" has a general altitude of abont 3,000 feet, the descent to the "Arroyo Grande," or "Arroyo Pastrana," on its eouthern side, being abrupt, the hill falling off rapidly as it approaches the river. The "Escritorio" is mnch lower, the eontheastern crest heing about 2,000 feet. The mountains in the immediate vicinity of the town are covered with a dense growth of small trees, shrubs and cacti, which furnish an abundant supply of firewood. The mountaine west of town are covered with a scattered growth of oak treee and abundant grass, the loftiest eummits prodncing a variety of pine efficient for bnilding purposes. The mining timbers are cut by the Indiane in the mountains, peeled and dragged down to the mines. The climate is delightful, and at all times there is efficient water in the river to supply the reduction works located on its course. The average fall of the river is sbont 40 feet to the mile.

The history and production of Batopilas is but little known, and consists mainly of traditions and a few official docnments, together with the evidences of ancient workings of the mines. Reports relegate the workings of the mine to the last century, and the unearthing of the lower works of the Pastrana mine last summer confirmed an official report dated in 1792. Various causes rendered cessation of work in the mines necessary, the unsettled condition of the country being the principal one. The mines remained idle for many years, in fact, nntil 1859, when Don Jorge Le Brun commenced an adit to drain Pastrana, bsfore finishing which a wealthy New York company purchased the entire interests on the hill of San Antonio, including the famous Carmen and San Antonio mines. Thie company prosecuted a deep drain tnnnel commenced about 10 years previoue by a Mexican. This tunnel cuts the veins in the hill of San Antonio at a depth of about 600 feet and ie largely remuneratives. Their success stimulated others and ths once famoue district of Batopilas has entered another era of prosperity.

The geological etructure of the district is simple, the variety of rocks being small, but their relations are eo complicated as to be difficult of solution. The formation consists of granite, greenstone, and highly metamorphosed slate, the whole capped by an immense floor of white, compact porphyry, known ae "Tierra blanca" (white earth.) It has a tendency to columnar structnrs, and gives the main features to the landscape, converting the summits of all the higher mountaine into a lsvel table land, with precipitous mural faces. From the summits west of town, looking in the direction of Chihuahua, up the valley of the Rio de Batopilas, the country resolves itself into a vast plateau, cut up by deep canyons, the escarpment of the Tierra blanca bsing frequently eeveral hundred feet in hight. In the neighborhood of town, grsenstone and slates predominate, both so intricately mixed as to make an exact definition of their boundaries a difficult matter; the location of these and the granite being frequently detected by their weathering, the granite to coaree sand, the greenstone to a reddish gravelly soil, and the elates to small, angular fragments.

The silver-bearing veins ars included within an area of about two miles and three-quarters in lsngth, on a lins northeast and southwest from the San Antonia mins to the Gnadalupe, at ths base nf the "Tierra blanca" bluffs west of town, with a breadth from northwest to sontheast of a little over two miles, ths most valuable portion, however, not heving a breadth of over one mile. The veins have a strike varying between north 40° west and north 40° east, with varying dip, cntting ths formation nearly at right angles, passing from ons rock to the other, bnt being piuched, broken and barren where they enter the granite. In the slates and greenstone they vary from a few inches to several feet in width; the same vein, when barren, beiug barely traceable, but, when productive, widening out to 2, 3, nr even 10 and 12 feet, between the walls. The veins, though small, possess a remarkable permanence and regularity. Not nnfrequently small threads, only 2 or 3 inchce inchee in thickness, will pay handsomely for exploration. With the exception of a few nnimportant veins, which have a gangue of quartz and produce oree of oopper, carrying but a emall percentage of silver, the gangue ie calc-spar. The silver occurring chiefly in the native form, aseociates with small quantities of chloride of silver near the surface, and silver glance and light red ruby silver in depth. The less valuable minerals are galena, arsenical iron pyrites, and a yellow zinchlende, the latter being a constant companion of the silver, and, wherever found, a sure indication of the near presence of that metal. Some veins yield a much larger percentage of the sulphureted ores than others, but in all they form but an insignificant proportion of the value of ths ore, which carries chiefly native silver.

Batopilas has yielded some very large masses of nativs silver, and the ore is frequently so full of metal, that in drilling the blast holes, they become lined with a sheet of silver, blowing off like a cannon instead of throwing down the ore.

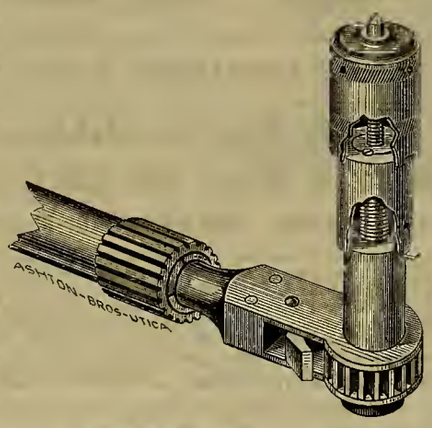
The river, the arroyos of Carmen, Chiquito, Pastrana, Dolores and San Antonio de los Tachos, naturally divids the district into six eubdivisions. On the east of the river is the hill of San Antonio, on its eouth the hill of Tajos. On the west of the river lies the hill of Animas, being in reality the extension of the hill of San Antonio cut through by the river. South of the arroyo of Pastrana comes the Escritorio hill; south of the arroyo of Dolores is the San Antonio de loe Tachos group, and still further to the southwest the hill of Descubridora.

The majority of the minee at Batopilas, although very ancient, had apparently been worked at the surface only; in some few tho workinge had penetrated on the vein a few hundred feet, but were abandoned. The developmente that have been made by means of the continuation of Mendazona's tunnel, beforeallnded to, have indicated a richness which the ancient minsr, satisfied with mere eurface digging, conld not realize. The veins cut by this tunnel are very numerous, in fact numbering 17 in all, the principal being Las Tierras, Dolores, La Rona, Geral, Rata, Mesquite, La Sastre and Juan Vaca, varying in width from one-half to three varas. All of these veins show silver in considerable quantitiee, some of them showing fiue bodies of calcspar well charged with fine, crystallized native silver, carrying some silver glance. The Geral in particular, though but slightly opened, paid the expenses of the entire concern. On the Juan Vaca vein the ore channel crosses the main tunnel diagonally. Drifting was commenced to the north, and after penetrating five varas, a vein of heavy metal about 18 inches thick was found occupying the whole hight of the breast. Explorations during the past summer showed a stratum nine feet thick of first-class ore, some of which yielded about $6,000 per ton. The hill of Antonio and of Animas have so far proved to be the richest. The ancient surface workings having yielded immense amounts, subsequent late developments dieclose the fact that the veins are richer bslow than at the surface. Tbis is being demonstrated by the Antonio tunnel which is now working some 600 feet below the surface, and encountering silver ore so rioh as to be difficult to blast, on account of its metallic nature. In the other districts the veins have produced large quantities of rich ore, and still contain unexplored riches. Traces of ancient workings are found everywhere, which, as has been said, were either at the surface or penetrated but a comparatively short distance on the vein, only those being worked which yielded silver at the surface.

Mining in Batopilas is rnde in the extreme. A ehaft or "posa" is sunk to the depth of about 10 varas, if the bunch of silver continues downward. From the bottom a short drift is run on the vein; from this another shaft of 10 varas is put down, this plan being followed to the deepest workings, snd is required by the mining laws as a protective measure. Poles, notched to servs as ladders, afford access from one part nf ths mins to the other, or laid sids by side across tho shafts for bridges. Up these laddsrs the ore is carried nn the backs nf peons, in sacke or "ssrones," holding ebont 150 ponnds each. The ors is so rich that constant stealing is going nn, and miners are willing to work for low wages on account nf the "pickings." The ore ie thrown down by blasting, tho holes being made with a very long pointed bar, which requires considerable room for working. A homemade powder, of poor quality, is nsed. In those mines controlled by Americans, the short bar and sledge and American powder have produced excellent results. Developments are slow for various reasons; the miners soon become rich aud cease work. Fortunately, the Msxican laws give any one the right to work a mine if the owner ceases to work it for four consecutive months, recognizing no ownership except that of actuel possession and active development of the property.

The reduction of the ore at Batopilas ie sasy. The facility with which the precious metals may bs ssparated from the ore forms ons of ite chief attractions. The richer orss are easily reduced by fire, the poorer ones by amalgamation, and the river furnishes all the necessary motive power. Probably two-thirde of ths silver produced ie by smelting. The heavy silver is firet pounded with a hammer nntil freed from vein matter, in which state it is passed to a smelting furnace in quantities of 50 pounds, realizing a loes of only 2% to 5%, on account of the fine powder which could not be separated by the hammer.

The other grades of ore, termed "Brosa" and "Chispeado," are pounded on large stones with emaller ones until the heaviest and most visible nails of silver are separated, together with the buttone of solid silver which accompany them. These, after being purified by washing from the grains and powder of the ganguo, are passed to the smelting furnacee in quantities equal to the first class, aud produce a result of 80% to 90% solid silver. The debris are gronnd to a coarse powder in arastras, with water, eo as to allow the silver to settle to the bottom upon the stones and between the joints. When thoroughly done, the sand is withdrawn from the arastra and the stones scraped with iron scrapers made for the purpose. These settlings are also smelted. The tailings, or remaining sands, are again run through the arastra and ground very fine. After which these are treated with quicksilver (in the patio) in "montons," or piles, of 900 lbs. The poorer ores are ground fins in arastras and treated with quicksilver (in the patio) in quantities of about 1,200 pounde.



STEBER'S RATCHET DRILL.

Ores are never fouud in thie district which contain only silver in combination with sulphur, arsenic, antimony, etc., without being accompanied by native silver, and the latter alwaye in excess.

After amalgamation of the sands or debris there must be included the final process of concentration, for the purpose of saving the unreduced sulphurete and some little amalgam. The residue thus obtained ie smelted with a little lead and cupelled as often as the accumulation will justify it. The oree worked in this way realize probably 95% of their value.

The district is ieolated and inconvenient of access for machinery, but, owing to the nature of the ore, machinery is neither applicable nor desirable to any considerable extent. The only improvement that might be introduced would be crushers to replace hand breaking, and better water wheele to economize the motive power. The reduction by fire of one ton of first-class ore, yielding from $10,000 to $15,000, does not exceed $50 to $60; by amalgamation, per ton, yielding $100 to $500, the cost is only $16 to $25, according to the loss of quicksilver. The loss, at present, is very great, and might be greatly lessened by concentration of the ore previous to working. The great difference between the specific gravity of the calcspar and silver would render this one of the easiest metallnrgical operations.

A Good Appointment.—Walter A. Skidmore, formerly assistant to the commissioner of mining statistics on this cosst, has been eelected by the Hydraulic Miners' Association to collect snch data as may tend to elucidats the vexed questions now in issue between the farmers and the miners, and to otherwise aid in promoting the objects for which this association was formed. Through his acquaintance in the mines, and hie knowledge of the mining laws, Mr. Skidmore brings to the discharge of his duties such a special fitness as ought to make his appointment to this position advantageous to his employers.

It is probable that the U. S. Land Commission will recommend the abolition of the land office in this district and the consolidation of all eimilar offices, placing them under control of the Department at Washington.

Steber's Ratchet Drill.

The peculiarity in this improvsd ratchet drill, which gives it superiority, consists principally in ths parts being formed in telescopic sections, having motions one upon the other, for the purpose nf giving it capecity to work in different situations, where eithsr a long nr short drill is required. On account of this adaptsbility in regard to lsugth it is adapted to a much greater variety of work than any other ratchet drill now in nse.

Tho working screws are all inside, and hencs not liable to become battered ae on common drills. The telescopio slesves fit one upon the other, so that the screws cannot become bent or etrained in any way, and remain perfectly accurate through long use.

These ratchet drills sre manufactured with the greatest care, of fine Stubbs steel. The working screwe are cut upon a lathe and every drill warranted to bore a perfectly true hole. The center and paul are tempered perfectly. To engineers, railroad men, machinists, boiler makers, and all other workers in hard metals, it will be found a great desideratum. It ie furnished with or without an extension handle, and of any size, by Dunham, Carrigan & Co., of San Francisco.

Gas as Fuel in Metallurgical Operations.

Prof. Hunter of Philadelphia, referring, in the *American Manufacturer*, to the use of gae as fuel in metallnrgical operations, npholds the use of hydrogen as fuel; but shows that under atmospheric pressure it is not more valuable than carbon, so far as its calorific intensity ie concerned. He urges that the distinction between the iuteusity (high temperature) and oalorific value of fuel should be maintained, ths former being needed in metallurgical nperations and the latter in the generation of steam.

From experiment, the calorific intensities of carbon and hydrogen, burning in air, ars as follows:

Carbon.....2720°C.=4928°F.
Hydrogen.....2725°C.=4937°F.

From this it is seen that the values under atmospheric pressure, as regards their intensities (high temperature), which alone is available for metallurgical pnrposes, are about the same.

These calculated amounts are the actual calorific intensity, values of the fuel, but are slightly higher than obtained in practice, owing to radiation, conduction, absorption and dilution. I have supposed that there was no sxcess of air, but thie is not the case in practice unlese a reducing flame is required; but, at all events, should there be an excess of air, it will diminish the intensities by absorbing as much heat in one case as in the other.

Bnt now put both under pressnre, or in other words, burn a greater amount of gas in a given time and epace, and the intensity will inetantly increase. To get carbon for fusl in the gaseous state, we must first convert it into carbonio oxide, and in doiug this we lose much of the calorific intensity of the carbon where we need it. In the case of hydrogen it is different. Now suppose we admit carbonic oxide under a given pressure, the calorific intensity would not be near as great as hydrogen under the same pressure, hence I prefer hydrogen as fuel in preference to carbonaceoue fuel. In one of my improvements in metallurgical operations I admit hydrogen mixed with other gases, under preseure into the furnace, whereby I obtain increased effect.

Phosphorus in Coal.

The necessity of great care in the selection of proper oree, flux and fuel in the manufacture of pig iron for conversion into eteel by the Bessemer and open-hearth processes, has directed the attention of Andrew S. McCreath, of Harrisburg, Pa., to the examination of the bituminous coal of Pennsylvania, who gives the result of his investigations in a late number of the *Journal of the Franklin Institute*. It ie necessary that iron intended for conversion into steel ehould be very pure, and especially must it be comparatively free from phosphorus. Only snch oree as are practically free from phosphorus can be used, and pure fuel is as much a necessity as pure ores, though hitherto iron men have paid comparatively little attention to this point.

Forty specimens were examined, the greatest number of which were selected from the Pittsburg bed, because it is the principal coal-bed of southwestern Pennsylvania, and most of the mineral fuel which is miued along the Youghiogheny and Monongahela rivers, to be used in the coke ovens of the Connellsville region and in the blast furnaces and mills of Pittsburg and its vicinity, and to be ehipped to western and southern markets, comes from thie bed. In 24 specimene tested from this bed, the amount of phosphorus varies from a mere trace to .1248%, equal to .2003% in the coke. Such a coke could not of course be used in the manufacture of Bessemer pig iron, and it is believed that in many casee unsatisfactory results have been obtained simply by the use of an impure fuel.

Nevada and Colorado miners have purchased silver workings in the neighborhood of Thunder Bay, Me.

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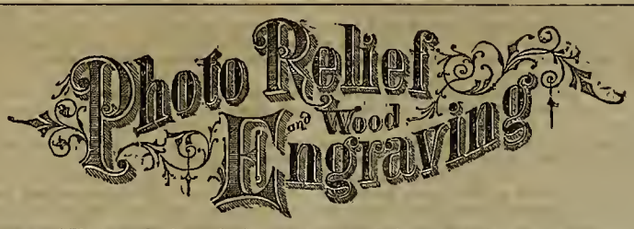

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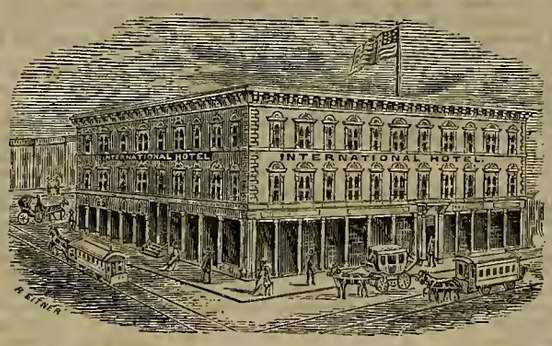

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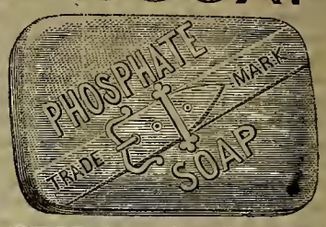

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If your wife will persist in the use of cosmetics, buy her a cake of PHOSPHATE SOAP and tell her to use it every night before retiring. In that way much of the harm will be avoided, as the skin will thereby be able to retain much of its natural vigor and beauty.

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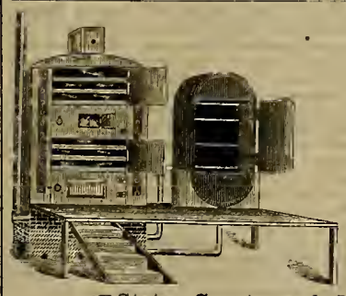

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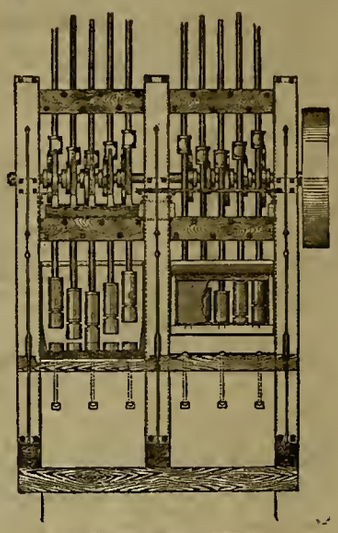

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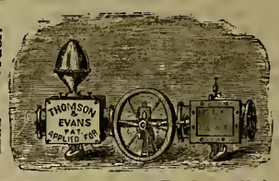

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[CONTINUED FROM PAGE 197.]

The south drift on the 2760 level is in 110 ft, and cutting porphyry. Work elsewhere going on without change.

BEST & BELCHER.—The work of sinking the joint Con. Virginia winze below the 1900 level will be resumed to-morrow. This winze is to be pushed to the 2150 level, and there will connect with the drift south from the Con. Virginia.

JULIA CON.—Excellent progress has been made during the past week in freeing the mine from the accumulation of water in it. It is hoped that the 2000 level will be dry by the last of the week. The new set of boilers is in place, and the masons are at work laying the containing brick.

MOUNT ROSE DISTRICT.

RATTLER.—*Reporter:* The Rattler mine is proving to be one of the richest prospects in Mount Rose district. There are now four men at work on the mine, who are taking out a ton of ore each, every 24 hours. The ore vein is from 14 to 18 inches wide, and we are informed is improving as work progresses. The ore now being extracted works $150 per ton in silver.

LANDER CO.—Battle Mountain *Messenger*, Sept. 20: At Galena the Avalanche Veritas mine shows, along the line of tunnel, good ore for 320 ft. A body of ore has been discovered in the Butte mine, which was passed over by experts. Three men are extracting $100 in ore per day. Assays $305 per ton.

WHITE PINE DISTRICT.

ITEMS.—Eureka *Sentinel:* The main workings of the Jennie A. have attained a depth of 550 ft. At the bottom the ledge is found to be larger and softer. The vein runs from two ft to 40 ft in width. The ore is yellow and black carbonate, and will average about $80 per ton. They have in sight ready for stoping not less than 10,000 tons. The experimental furnace will be completed and started up the present week. There is a large amount of ore on the dump and 150 cords of wood at the furnace. The Keystone, located south of the old Eberhardt mine, is yielding some very rich ore. The Aurora tunnel is in between 4,000 and 5,000 ft. A number of parties have lately gone to work on old claims which have been idle for years.

ALASKA.

ITEMS.—The Stewart mine at Sitka lately shipped $1,600 in bullion, the product of a week's run of the five-stamp mill. Water-power is a failure from insufficiency. The Alaska G. & S. M. Co., have been advised by their superintendent to send up a 20-stamp mill immediately, with steam-power. The mountains are being prospected in every direction and new ledges discovered every day. Work on the Witch mine is progressing. Arastras are being erected. Haley sold a third interest in the Haley & Miletich lode for $7,500 to the Baronoff Island Mining Co. They will tunnel this winter, and commence a mill early in the spring. They also own the Witch and Cozian mines. A large quantity of ore is shipped to San Francisco from various lodes for a thorough test. Fresh arrivals of miners take place constantly, who all concur in the opinion of the good character of the quartz. Much fine gold is in some veins. The Baronoff Island Mining Co. are now erecting a storehouse and wharf, preparatory to extensive operations in the spring. Reports from Cassiar are discouraging. Nothing new has been found, and the old claims are worked out. The miners are leaving for the Sitka quartz mines.

COLORADO.

ALMA.—Denver *Tribune*, a correspondent says: Large bodies of low-grade carbonate ore have been discovered in a number of shallow openings in the timber just above town. The ore as exposed is from 2 ft to 6 ft in thickness, and assays from 12 to 60 ounces in silver, and 15% to 60% in lead. At least 10 to 12 openings in Buckskin spur of Mount Bross that extends to the town of Alma show the above amounts and character of ore. The output of the Fanny Barret shaft for Saturday, the product of the labor of three men while driving a drift, was seven tons of good smelting ore. This was without stopping. A drill was shoved down in the sand carbonate for about 5 ft below the bottom of the shaft. Hundreds of tons of ore are now exposed in this new mine. A fine body of good-looking sand ore has just been struck in the Kansas Extension mine at the depth of 23 ft. The Avalanche mine, adjoining the Loveland mines, has just been sold under an old bond at $5,000, while $30,000 was offered for it if the bond could be broken. The Blackhawk mine, in Pennsylvania gulch, has from 3 ft to 5 ft of ore that mill-runs from 50 to 350 ounces of silver per ton.

LITTLE PITTSBURG.—Boulder *News:* The pay streak in this mine averages about a foot in width, and carries a grade of tellurium rich enough to ship without sorting.

PARK CO.—Fairplay *Flume:* New discoveries in Buckskin gulch yield large assays. On the Bross Mountain slope the mineral outcrop is prodigious, particularly on the Duke. For 70 ft in width at one point on the surface the rock may be broken anywhere and the fracture will disclose bright galena all through it. The ore lies in a well-defined vein for a width of 25 ft, the balance of the "blow out" being mineralized country rock. The vein matter is alleged to average over 30 ounces in silver and 55% in lead.

IDAHO.

ITEMS.—Oneida County *Enterprise:* Rich mines are said to have been discovered at Alturas Lake. The Montana yields a high standard of ore, in a 6-ft vein. The Badger mine shows a 9-ft vein of ore. Assays at from $200 to $600 per ton. In the Charles Dickens a new tunnel has been driven into the hill, at a point 100 ft below the old one, and good ore is found. The placer miners on the upper Snake river are doing moderately well. The silver-plate process is the best adapted to saving the flour gold.

ITEMS.—*Statesman:* An old man prospecting on Dry creek has struck a lead about eight miles from town (Boise City), and went down in it 10 ft, finding a base metal lead 8 ft wide.

YANKEE FORK.—The ledge on the Custer lead is shown by a tunnel to be 600 ft in depth from the apex of the outcropping.

ALTURAS.—Rich and extensive discoveries are said to have been made on the headwaters of Wood river. Seventy-five men are operating in the mountains around the Salmon lake. Eighteen miles from Atlanta, on the Bonanza City trail, several rich mines have been opened, largely composed of ruby and native silver.

MONTANA.

ITEMS.—Helena *Independent:* Several parties who have been prospecting for two years on the Bald butte, one-half mile south of the Penobscot mine, have at last struck a vein about 20 ft from the surface. It has a width from 6 to 14 ft. The ore is very rich. On Wisconsin creek, near Sheridan, McConnell & Co. are running an arastra on $20 ore from the Anna. Parties are running a hydraulic on a bar below the canyon, and doing well. The Company mine has a new six-stamp mill running on ore. The 350-foot tunnel of this mine taps the vein which is three ft wide, 150 ft from the surface. Ore from the Plymouth Rock averages $20 per ton working with an arastra. Numerous quartz and placer mines are being worked along this creek. The new diggings at Yago gulch, Meagher county, on which are located the Judith mines, are 65 miles from Diamond City, 105 from Bozeman and 100 from Helena. The whole gulch is about all staked. Sluices are being put in.

NEW MEXICO.

ITEMS.—Grant County *Herald*, Sept. 17: Some prospectors, who left Georgetown three weeks ago, have returned, bringing some very good-looking specimens of gold and silver quartz. Parties who have been prospecting through the mountains to the north and east of the Mimbres report that they have discovered and located some mines which bid fair to prove to be not only rich but abundant in quantity of ores. The formation being granite and the veins being large on the surface, every indication is that they will be paying mines. Bremen's mine is said to contain a body of ore reaching out of sight in all directions, and running from $6 to $8 per pound. The Manzano and Sandia mining district is yielding rich specimens of ore. The rock assays from $50 to $200 per ton. At Corrillos the leads are improving. The latest assays of the Oread give 305 ounces to the ton. The Condor is 20 ft deep. The Carbonate, 140 ft, improving more. F. I. Alden, an old miner from Oregon, has a rich find of blue chlorides of silver; the first one of the kind in this camp. The Red Jacket lode belonging to the Essex Co-operative Mining Association, has a 2-ft crevice, with a 22-inch pay streak; it appears to carry a large quantity of native silver; this is the best mine in the northern part of this district.

OREGON.

VIRTUE MINE.—Bedrock *Democrat*, Sept. 17: The steam pump on the 400 level forces a continual stream of about 25 inches from the mine. The ledge has been stoped several hundred ft in length and over 300 ft in hight. Sinking the main shaft is about being commenced.

C. F. M. Co.—*Oregonian*, Sept. 20: Specimens of gold and silver-bearing quartz were left at this office Wednesday, taken from the ledge of the Canal Fork mining company. This ledge has been worked a little for the past three years, but active operations were inaugurated only about three months ago. The ledge is located in the Cascade mountains, about 30 miles from Mehama and two miles from the White Bull. The ledge varies in width from 18 inches to 3 ft, and is well defined. Quartz taken from this ledge has been assayed in this city and yields from $150 to $250 per ton. Bernard and Vonach are the superintendents.

A Gold Gleaner.

We have been shown a model of a device for saving gold and other precious metals that will doubtless ultimately work its way into favorable use, and he worthy of the appellation of "Gold Gleaner," which has been given it. Since the inventor, Mr. Bryan Tyson, over five years ago, constructed the first device of this kind, important and valuable changes have been made. It is especially designed for saving fine gold and rusty gold, black sand, sulphurets, etc., from the tailings of either quartz or hydraulic mines. Much gold is, as Mr. Tyson believes, lost by attempting to save it in the midst of too much sand, or similar substances. His device, as now improved and remodeled, consists, in the first place, of a suitable arrangement for skimming, or rather cutting, out a thin stratum from the bottom of the flowing sands. To prove the efficiency of this plan, he cites his experiment at Bodie of August, 1878. In his first experiment he worked the whole amount of tailings as they flowed from the mill, and in two days took in amalgam and sulphide of silver to the amount of some $13. He then changed his device so as to work only a thin stratum of tailings taken from near the bottom, and in other two days took over $100, having increased his catch nearly eight-fold. It is a model of this device, since greatly improved and reduced to machinery, of which we now speak.

The next feature consists in a simple and effective device for keeping the sands between ordinary riffle bars loose, thus apparently presenting all necessary facilities for the precipitation and settling of the precious metals to a place of safety. This device, as Mr. T. tells us, has only been partially tested, and yet answered an excellent purpose in saving both gold and quicksilver. Recent improvements, as pointed out to us, will doubtless render it far more effective.

The next feature is a concentrating pan, worked as a jigger. The most important feature about this is its construction for stirring the sands near the surface, thus greatly facilitating the settling of the precious metals, or other heavy substances. It is specially designed for saving black sand, sulphurets, and such of the precious metals as may have escaped the devices above. It was Mr. Tyson's intention to attach a device of this kind to his works at Gold Run, but he was not able to complete it before the rainy season set in, and it has therefore not been tested. The fundamental principles thereof have, however, been so thoroughly tested in other experiments that he considers there can be little or no doubt as to the result.

He has also shown us a model of his device as now constructed at Gold Run. The principle involved is mainly the same as in the foregoing—keeping the sands between riffle bars loose by appropriate machinery—but as this method only procured concentrations, such as may be procured by his new method without machinery, it has been abandoned for the far more simple and cheaper as well as more effective method above described.

Some splendid results were, however, obtained from some of the early experiments with the device abandoned, but the construction was such as to render it tedious to clean up, and it was therefore impractical for general use. As now amended and improved it can be cleaned up as easily as an ordinary under-current.

Some of the most important features of the portion abandoned, that actual tests have shown to be of great value, in fact indispensable, will still be retained in the new device. Rigid tests will doubtless find the Gold Gleaner to be possessed of considerable merit, and important results may therefore be expected in the near future.

A MIRROR BAROMETER.—M. Leon Tesserenc de Bort has ingeniously modified the common aneroid barometer by substituting for the train of clock-work terminating in a pointer, a mirror mounted on a jeweled axis, which is rotated by the rise and fall of the exhausted receiver, and its indications read off by a small telescope by reflection from a graduated scale. The sensibility of the instrument is said to be much increased, and all errors due to a long train of wheel-work are eliminated.

Carribou Gold Mining District.

We learn from the Idaho *Enterprise* that this is a comparatively new mining district of Oneida county, Idaho. It takes its name from Carribou mountain, which rises abruptly some 10,000 feet, and is the highest of Snake River chain. The hills and gulches are full of prospect holes, and the ground is nearly all located for several miles around Iowa bar. There is said to be plenty of pay dirt, but water is scarce. The best worked placer digging is that of Sweeney & Feeney, at Iowa bar. They have the best water privilege and plenty of it for working all the year round. Their ditch extends up the mountain side for over two miles, is fed by strong and never-failing springs, and when thrown through the three-inch nozzle pipe at a bank of dirt it crumbles away very rapidly. Even large boulders are carried away by the force of the current from the pipe for rods. They play this pipe on the bank until several tons of dirt are caved down, and then wash it all away, leaving the gold to settle to the bottom; it is then washed out into the sluice ways, and cleaned up every week or as often as desired. It is said that they net about $50 per day.

The Robinson mine is located on the north slope of the mountain, bears southeast and northwest, and where a crosscut shows 18 feet of a ledge of degenerated sulphuret ore. The predominating element of all quartz veins in this district is iron, both as a sulphide and sulphuret, and in its contact with the organic elements of the earth has turned into a red dust. This being strongly charged with silver and gold, is amalgamated together in veins. These veins are in this district from 6 to 20 feet in thickness, and are all gold-bearing but not very rich, as but few if any of the veins sampled so far run over $100 to the ton, but there being such immense bodies of ore, and wood and water being handy, they will pay richly to work. The Robinson mine must have about 1,000 tons on the dump and several thousand tons in sight, and is only waiting for a 40-stamp mill to be erected close by to insure the owners a fortune. It is owned by John Robinson, John Tiernan and Joseph Farran, the latter two gentlemen residents of Salt Lake city. We understand they are looking to the erection of a mill during the early part of next season.

In other mines tunneling has disclosed either the same vein or ore of the same character as the Robinson mine. All of the ledges are of great thickness and an immense supply of ore. The placer mines of this district are rich and extensive, and its quartz veins are immense and easily and cheaply worked, and rich enough to pay large profits to the owners of the mines and mills. What it needs is mills to work up the ore, of which the whole mountain seems to be composed.

California Balloon Bush.

A matter of much interest to botanists and perhaps to growers of interesting shrubs is the rediscovery by Prof. J. G. Lemmon, of Sierra Valley, of the long lost "Balloon bush" of California (*Staphylea Bolandera*, Gray.) This curious bush was first found by Prof. Bolander many years ago, but he found it only in bloom and the description in the first volume of the Botany of California is meager from this fact. There has been an eager demand for fruiting specimens of the shrub, and thorough search has been made, but it has eluded the pursuer until a few weeks ago Prof. Lemmon found it after a long day's search up and down the McCloud river near Mt. Shasta. It was in full fruit and Prof. Lemmon has arranged to have the seed collected. The announcement of the rediscovery has excited a storm of inquiries and expressions of gratification from Eastern botanists.

The balloon bush of California is of especial botanical interest because it belongs to a genus (*Staphylea*) which contains but four species beside it, and the geographical distribution of these four species is quite remarkable. One is indigenous to the Eastern States, another in Western Europe, another in Himalaya mountains of India, and the fourth in Japan. Prof. Lemmon gives us some points in description of the California species which indicate that it would be a most interesting shrub for ornamental grounds in this climate. The shrub or tree itself somewhat resembles the ash, having an orbicular leaf, but its leaves are grouped in threes unlike the ash. It grows from four to ten feet high and has a striking appearance. The young branches are of clean straight growth and suggest a fitness for walking canes. But the most interesting part of the shrub is the fruit which has been so long sought for. It is an inflated three-angled balloon from two to three inches long and pendent like a pear. These balloons hang in clusters of three or more. They are of light green color when growing and turn chestnut colored when mature. When mature they remain persistent on the limb through the winter. They contain from three to six large, hard, black seeds which become detached and rattle in their dry case when the wind stirs the branches. Thus the dry fruit may be likened to a rattle box. The flowers are of whitish color, half an inch in diameter and borne upon a pendent raceme.

Such in brief is a very interesting indigenous shrub which may ere long become an interesting object on our lawns through Prof. Lemmon's persistent research and fortunate discovery.

News in Brief.

SECRETARY SCHURZ is in the Indian Territory.

THERE is a prospect of war between Egypt and Abyssinia.

A MINISTERIAL crisis has occurred in the Argentine Republic.

THE Bank of Montreal is charging 20% discount on British silver.

THE slaves of Cienfuegos, have risen in rebellion against the Spaniards.

ENGINEERS and machinists are leaving England for the United States.

THE reports regarding the famine in Cashmere are still very gloomy.

THE work of connecting the Black and Caspian seas has been commenced.

RICH lead discoveries are reported from Clark and Hot Springs counties, Arkansas.

LAST Saturday 50,000 bushels of grain was shipped from New York for Europe.

LORD LOFTUS opened the Industrial exhibition at Sydney on the 22d inst.

IT IS estimated that 1,500,000 gallons of wine will be made in Napa valley this season.

THE strike of the colliers in Staffordshire has been ended by the masters yielding.

J. WARREN WOODWARD, Justice of the Supreme Court of Pennsylvania, is dead.

EXTENSIVE deposits of almost pure gypsum have been discovered near Seattle, W. T.

THE negroes continue to migrate to Kansas. Cheap rates are offered them on railroads.

SILVER in London, 51⅝d; consols, 97 11-16; 5% U. S. bonds, 105¾; 4s, 104⅝; 4½, 108½.

SINCE January 1st the arrival of gold at New York, from Europe, amounted to $27,000,000.

AT LIVERPOOL, wheat is quoted at 9s@9s 9d for average California white, and 9s 9d@10s 3d for club.

THE colored people celebrated the issuance of the Emancipation Proclamation at Chicago on the 22d.

FORTESQUE, an American, has been sentenced at London to ten years' penal servitude for forgery.

THREE men at Louisville ate toadstools for mushrooms. One died, the others are in a critical condition.

THE clipper ship *James Nesmith* is nearly loaded and will leave New York for San Francisco Saturday.

H. DEL BONDIO & Co., heavy exporters of grain at New York, have failed. Western firms lose heavily.

EMPEROR WILLIAM received a cool reception from the French-speaking portion of the population at Strasbourg.

A CONGRESS in the interest of America is in session at Brussels. The King of Belgium and President Blanco of Venezula were present.

"LORD MURPHY," the three-year-old colt that captured the Derby and St. Leger victories, has been purchased by James Keene for $10,000.

IN SAN FRANCISCO, half dollars are quoted at 99½ buying, 99¾ selling; trade dollars, 97 buying, 98 selling; Mexican dollars, 90 buying, 91 selling.

THE French Scientific Association speaks encouragingly of the future of American wines, and says the two great defects are virgin soil and inequality.

THE news of the outbreak at Herat, Afghanistan, is confirmed. The Governor's house was plundered and burned, and the commanding General murdered.

REV. THOMAS GUARD, of San Francisco, has been called to his old post as pastor of the Mount Vernon M. E. church, of Baltimore, and has signified his acceptance.

IN NEW YORK, Government bonds are quoted at 102⅜ for 4s of 1907; 102⅝ for 5s of 1881; 105 for 4½s; sterling, $4.82@4.84; silver bars, 112; silver coin, ½@1 discount.

THE Rancho El Sobrante case is now awaiting the final decision of the Department at Washington. Should the Surveyor-General's opinion be adopted it will give all bona fide claimants the lands occupied by them.

THE grain house of Smith, Howell & Co., Philadelphia, failed on the 22d, with liabilities at $200,000. The failure is owing to the increase in the price of grain the past few days. I. Jenks Smith, head of the firm, is President of the Commercial Exchange.

FIRELESS LOCOMOTIVES.—At the recent meeting of the British Association for the Advancement of Science, M. Bergeron read a paper on Leon Francq's fireless locomotive. The idea of such a locomotive was originated at the time of the horse plague in New Orleans, in 1872. After the Franco-German war, M. Francq, who was connected with the Paris tramways, gave his attention to discovering a motive power for his tramcars. The object he had in view was the obtaining such heat from water as would supply the motive power he needed. The engine in question was the result of his investigations. It had a large cylindrical reservoir, surmounted by a steel dome, two cylinders acting with piston rods, and a crank carrying two driving wheels, which were connected with other two wheels. The reservoir holds more than 700 gallons of water, heated to such an extent as to produce a pressure of 224 pounds to the square inch. It was claimed for the new engines that they were very economical in every respect. It was pointed out that the engine would be especially useful on the metropolitan lines, as it neither gave off smoke nor deleterious gases. In a few weeks an engine of this character would be used on the tramway at Leeds, and another at Liverpool docks. These engines are largely used on the French plantations in the West Indies.

Birth of a Storm.

In a lecture delivered by Robert H. Scott, M. A., F. R. S., etc., at the London Institution, he declares that storms are almost without exception foundlings. It has been claimed by Dove that storms are due to the interference of the Polar current, or the east wind, with the equatorial current, or west wind. The east wind being air flowing from the north or south pole toward the equator, and the west wind, the air endeavoring to make its way back to the pole from the equator, both being modified in the direction of their motion by the change of latitude.

This view has been superseded of late years by the modern views of the relation between the wind and the distribution of barometrical pressure. We are still, however, in comparative ignorance of the ultimate causes to which this distribution of pressure, or the rise and fall of the barometer, are due.

Various theories have been propounded to account for storms which are generally more or less cyclonic in their character. Ley, and others, attribute the formation and progress of a storm to the condensation of moisture, ignoring the fact that many of our heaviest rains do not give rise to cyclonic disturbances of serious character, and frequently come in times of nearly absolute calm.

Mr. Meldrum, of the Mauritius, through investigations into the weather over the Indian ocean, is lead to the belief that every cyclone is generated in the intervening space between two oppositely flowing currents of air, of which the easterly moving stream, speaking in general terms, lies on the polar side of the westerly wind. This view, however, was called seriously in question by Messrs. Blanford & Eliot, in their discussion of recent cyclones in the Bay of Bengal, which they have been able to study from very early stages, and in which they fail to see evidence of the pre-existence of two, and only two, determinate currents.

M. Faye, of Paris, in a third theory of the origin of these storms, argues strongly that, as interfering currents in rivers give rise to vortices which extend from the surface downward into the water, so all our water spouts, *trombes*, and even the largest tropical hurricanes, must be all formed in the upper regions of the atmosphere, and extend downward to the earth; the force which gives them their onward motion being supplied by the upper currents.

This theory is not accepted because recent investigation into the motion of cirrus clouds, shows beyond a doubt that the motion of the upper currents of air over a cyclone is outward and not inward. Moreover, very lately there was observed, on the Lake of Geneva, a veritable small waterspout, 40 feet high, and 30 feet in circumference, formed by the meeting of two winds, known locally as the *Foehn* and the *Bise*, on the surface of the lake.

The last theory is that of the late Thomas Belt, who assumed as the first cause the heat of the sun. The heat rays pass through the atmosphere without warming the upper strata, and so Mr. Belt supposed that over a sandy soil a mass of air close to the ground might rise in temperature much higher than the superincumbent layers of the atmosphere, sooner or later the heated lower air would burst up, and the ascending column thus produced would be the nucleus of the nascent cyclone. Accredited instances of whirlwinds over volcanoes like Santorin, and over extensive fires like those of Carolina canebrakes seem to be facts in favor of this theory. From other prominent facts attending the production of a cyclonic disturbance, the origin thereof may be attributable to more than one agency, as all the theories have some facts in their favor. Prof. Scott declares that it is a mistake to assert that all storms are connected with cyclonic disturbances. The force of the wind depends on differences of atmospherical pressure over a given area, and the only reason why storms are generally associated with cyclones is that these systems afford the most serious instances of disturbances of atmospheric equilibrium, and consequently of differences of pressure, which are met with on the globe. At any place where an area of relatively high pressure comes into close proximity to an area of relatively low pressure, a gale will result, and so a storm may be due just as much to the rise of the barometer in one region as to its fall in an adjacent one. Wherever there is a rapid decrease there is a steep gradient, and consequently a strong wind.

Every cyclone is not accompanied by a storm. The cyclone, in its general terms, simply indicates a region of diminished pressure, round and in upon which the air moves in paths. The direction and force of the wind are regulated by the difference of barometrical pressure over a given distance, and not by the actual hight of the barometer at the station at which the storm is felt, or by the distance of that station from the point where the barometrical reading for the time being is the lowest.

The principles of wind motion have a most important bearing on the theory of the motion of the air in hurricanes and typhoons. The old popular idea was that the air blew round and round the central calm in circles, so that any sailor caught in one of these storms, if he was scudding before the wind, the center would lie exactly on the starboard beam in the northern, and on the port beam in the southern, hemisphere. Modern meteorologists, however, declare for a spirally incurving movement as the most probable behavior of the wind; and this suggestion of spiral motion must, of course, modify the simple rule for a ship when scudding, of looking in the wind's eye, and taking eight points on the starboard or port side for the storm center, and indicates the probability that the true position of that spot will be at least two or three points ahead of the bearing given by that rule, so that the ship, if scudding, may be gradually approaching the most dangerous part of the storm.

As yet meteorologists have been unable to produce evidence of the birth of a storm, neither has anyone been fortunate enough to be in at the death of one. Some claim that storms can travel all around the world, until at last they travel off.

They have been traced from the Pacific coast across the Atlantic, but very rarely. This fact, however, favors the condensation theory of storm generation, since it is held that, as the moisture in the air is the food of the storm, so, when that moisture is deficient, the storm dies of starvation. We may, however, point out the dust-whirls at street-corners, which waste and wane without any assistance from vapor condensation. We do not yet know why one depression in the atmosphere lills up, while another becomes deeper. What causes the barometer to rise or fall, is still an unsolved problem.

EVERY new subscriber who does not receive the paper, and every old subscriber not credited on the label, within two weeks after paying for this paper, should write personally to the publishers without delay, to secure proper credit. This is necessary to protect ourselves and subscribers against the acts and mistakes of others.

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1870	20	2 Complets volumes, 1st half (of year).
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1870	20	1 Copy each of No. 1, Jan 1st, 3 of Jan. 14th, 7 Feb. 11th, 6 Feb. 4th.
1870	21	1 Copy of No. 7, August 13th.
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1871	22	3 Copies of No. 5, Feb. 4th.
1871	22	1 Copy of No 3, Jan. 21st, 6 of Feb. 2d, and 1 of May 1st.
1871	23	1 Copy of No. 2, July 15th, and 9 Sept. 2d.
1872	24	2 Copies of No. 4, Jan. 27th.
1872	24	3 Copies of No. 7, Feb. 17th.
1872	24	2 Copies of No. 17, April 27th.
1872	25	1 Copy of No. 10.
1872	25	1 Complete volume, last half (of year).
1873	26	3 Copies of No. 8, Feb. 22d.
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1873	26	1 Copy of No. 7, Feb. 15th.
1873	27	3 Copies of No. 20, Nov. 15th.
1873	27	4 Copies of No. 21, Nov. 22d.
1873	27	3 Copies of No. 24, Dec. 13th.
1875	30	1 Copy of No. 4, Jan. 23rd.
1875	30	1 Copy of No. 5, Jan. 30th.
1875	30	1 Copy of No. 8, Feb. 20th.

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MESSRS. DEWEY & CO.— *Gentlemen:*— Have received my letters patent for the bar roller to-day. I am very much obliged to you for your prompt service, and will recommend you to all who may want your assistance.

I remain yours, etc., GEO. MEDINO.

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Chew JACKSON'S BEST Sweet Navy Tobacco

METALS.

[WHOLESALE.]

WEDNESDAY M., September 24. 1879

IRON.—	
American Pig, soft, ton	23 00 @26 00
Scotch Pig, ton	25 50 @26 50
American White Pig, ton	23 00 @— —
Oregon Pig, ton	25 50 @— —
Refined Bar	2½@ 3½
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 7
Norway, according to thickness	6½@ 7
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @
TIN PLATES.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb. less than cask	9½@— 10
NAILS.—	
Assorted sizes	2 90@3 00

LEATHER.

[WHOLESALE.]

WEDNESDAY, M., September 24, 1879.

Sole Leather, heavy, lb	22 @ 29
Light	20 @ 24
Jodot, 8 Kil., doz	48 00 @50 00
11 to 13 Kil	65 00 @76 00
14 to 19 Kil	80 00 @90 00
Second Choice, 11 to 16 Kil	55 00 @70 00
Cornelian, 12 to 16 Kil	67 00 @67 00
Females, 12 to 13 Kil	63 00 @67 00
14 to 16 Kil	71 00 @76 00
Simon Ultimo, Females, 12 to 13 Kil	58 00 @62 50
14 to 15 Kil	66 00 @70 00
16 to 17 Kil	72 00 @74 00
Simon, 18 Kil	61 00 @63 00
20 Kil	65 00 @67 00
24 Kil	72 00 @74 00
Robert Calf, 7 and 9 Kil	35 00 @40 00
Kips, French, lb	1 00 @ 1 35
Cal. doz	40 00 @60 00
French Sheep, all colors	8 00 @15 00
Eastern Calf for Backs, lb	1 00 @ 1 25
Sheep Roans for Topping, all colors, doz	9 00 @13 00
For Linings	5 50 @10 50
al. Russet Sheep Linings	1 75 @ 4 50
oot Leg, French Calf, pair	4 00 @— —
BGood French Calf	4 00 @ 4 75
Best Jodot Calf	5 00 @ 5 25
Leather, Harness, lb	15 @ 38
Fair Bridle, doz	48 10 @72 00
Skirting, lb	33 @ 37
Welt, doz	30 00 @50 00
Buff, ft	38 @ 21
Wax Side	07 @ 80

LUMBER.

WEDNESDAY M., September 24, 1879.

CARGO PRICES OF REDWOOD.

Rough, M	13 00
Refuse	9 00
Clear	23 00
Clear Refuse	13 00
Rustic	23 50
Refuse	18 00
Surfaced	20 00
Refuse	14 00
Flooring	20 00
Refuse	12 00
Beaded Flooring	23 00
Refuse	13 00
Half-inch Siding	16 00
Refuse	14 00
Half-inch Surfaced	20 00
Refuse	14 00
Half-inch Betteus	16 00
Pickets, Rough	11 00
Rough, Pointed	12 50
Fancy, Pointed	18 00
Shingles	1 75

CARGO PRICES OF PUGET SOUND PINE

RETAIL PRICE.

Rough, M	18 00
Fencing	18 00
Flooring and Step	28 00
Narrow	30 00
2d quality	25 00
Laths	3 50
Furring, lineal ft	

REDWOOD.

RETAIL PRICE.

Rough, M	18 00
Refuse	14 00
Siding	20 50
Surfaced & Long Beaded	30 00
Flooring	30 00
Refuse	22 50
Half-inch Surfaced	30 00
Rustic, No. 1	30 00
Battens, lineal ft	
Shingles M	2 00

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending September 23, 1879.

HIGHEST AND LOWEST BAROMETER.

Sept. 17	Sept. 18	Sept. 19	Sept. 20	Sept. 21	Sept. 22	Sept. 23
29.991	29.939	29.948	30.090	30.007	30.030	29.995
29.932	29.864	29.895	29.950	29.971	29.934	29.969

MAXIMUM AND MINIMUM THERMOMETER.

62	64	64	66	68	66	66
54	54	54	58	57	57	57

MEAN DAILY HUMIDITY.

86	86.7	82.7	83.7	78.7	81.3	77.3

PREVAILING WIND.

W	W	W	W	W	SW	W

WIND—MILES TRAVELED.

232	188	256	189	148	162	201

STATE OF WEATHER.

Cloudy	Foggy	Fair.	Fair.	Fair.	Clear.	Cloudy

RAINFALL IN TWENTY-FOUR HOURS.

Total rain during the season, from July 1, 1879. 0.93 in.

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, September 24, 3 P. M.

SILVER 25.

GOLD BARS, 890@910. SILVER BARS, 10@18 ⅌ cent. discount.

EXCHANGE on New York, 20, on London bankers, 49½@ 49¾. Commercial, 50; Paris, five francs ⅌ dollar; Mexican dollars, 91.

LONDON CONSOLS, 97 9-16; Bonds (4%) 104¾

QUICKSILVER in S. F., by the Cask, ⅌ lb. 38½c.

Amusements.

CALIFORNIA THEATER.

BARTON & LAWLOR.....Manager.
BARTON HILL.....Acting Manager.

THE COLOR GUARD.

Bush Street, above Kearny. Open every evening. Box office open from 9 A. M. to 10 P. M. Seats may be secured six days in advance.

BALDWIN'S THEATER.

THOMAS MAGUIRE.....Manager.
CHAS. H. GOODWIN.....Treasurer.
J. P. CHAPMAN.....Assistant Treasurer.

CRUTCH AND TOOTHPICK.

Corner Market and Powell Streets. Open every evening and Saturday matinee. Box offices open daily.

BUSH STREET THEATER.

CHAS. E. LOCKE.....Lessee and Manager

PYRAMUS AND THISBE.

Open every evening and Saturday Matinee.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

The Pacific Land and Trust Company.—

Location of principal place of business and works, San Francisco and State of California.

Notice is hereby given that at a meeting of the Board of Directors held on the eighteenth day of September, 1879, an assessment (No. 1) of One Dollar and Twenty-five cents per share was levied upon the capital stock of said corporation, payable immediately to the Secretary at the office of the company, 513 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on Saturday, October twenty-eighth (28th), 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before will be sold on Saturday, November eighteenth (18th), 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

WM. ANDREWS, JR., Secretary.

Office, 513 California street, San Francisco, Cal.

Butte Hydraulic Mining Company.—Prin-

cipal place of business, San Francisco, California. Location of works, Butte county, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 25th day of August, 1879, an assessment of Ten Dollars per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the Company, Room 20, No. 328 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 29th day of September, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the 21st day of October, 1879, to pay the delinquent assessment, together with the cost of advertising and expenses of sale.

L. L. DENNERY, Secretary.

Office, Room 20, No. 328 Montgomery st, S. F. Cal.

Gover Mining and Milling Company.—

Location of principal place of business, San Francisco, California. Location of works, near Drytown, Amador County, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 30) levied on the sixth (6th) day of August, 1879, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Am't.
Ashby, Mark F, Trustee	907	1341	$670 50
Ashby, Mark F, Trustee	908	800	400 00
Brayton, M L	847	4'0	290 00
Brayton, M L	901	115	57 50
Gorrie, Thomas	682	10	5 00
Pratt, Freeman	408	10	5 00
Preble, Edward E	880	45	22 50
Knox, Joseph A	567	100	50 00
Knox, Joseph A	571	50	25 00
Knox, Joseph A	572	50	25 00
Knox, Joseph A	573	50	25 00
Knox, Joseph A	726	30	19 50
Skinner, E C	441	100	50 00
Skinner, E C	019	100	50 00
Skinner, E C	620	50	25 00

And in accordance with law and an order of the Board of Directors, made on the sixth (6th) day of August, 1870, so many share of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, room 8, No. 402 Front street, San Francisco, California, on Monday, the sixth (6th) day of October, 1879, at the hour of one (1) o'clock P. M. of such day, to pay delinquent assessments thereon, together with costs of advertising and expenses of the sale.

W. O. WILSON, Secretary.

Office, Room 8, No. 402 Front street, San Francisco, Cal

Annual Meeting.—Syndicate Mining Co.,

of Bodie, Mono County, California.

The annual meeting of the above named Company will be held at the office, Room 26, Hayward's Building, 419 California street, San Francisco, Cal., on Thursday, October 16th, 1879, at 1 o'clock P. M., for the purpose of electing a Board of Directors to serve for the ensuing year, and for the transaction of such other business as may properly come before the meeting. Also in accordance with a resolution adopted at a meeting of the Board of Directors, held September 15th, 1879, to take into consideration and decide upon the proposition to increase the capital stock of said Company, from Five Million Dollars divided into fifty thousand shares at the par value of one hundred dollars per share, the present capital of the Company, to Ten Million Dollars, to be divided into one hundred thousand shares of the par value of one hundred dollars each.

THOS. G. TAYLOR,
ROBT. N. GRAVES,
GEO. W. HOPKINS,
CHAS. H. FISH,
} Directors.

The transfer books will be closed October 6th, 1879, at 3 P. M. JACOB STADTFELD, JR., Secretary.

Canadian Patents for U. S. Inventors and Patentees.

One Patent now Embraces all the English Provinces in North America, including the Canadas and British Columbia.

It is only recently that the Canadian Government has granted patents to United States citizens. In consequence hereof the many immensely valuable inventions patented in this country are now patented in Canada. Patents are much sought for and are readily disposed of at fair cash prices. In our country about three-fourths of all manufacturing is based upon patents, especially in the New England States no manufacturing business of any consequence is started without being protected by such. Our neighbors across the border have not been slow in observing and learning that inventions and patents are the foundation of all prosperity in manufacturing purposes. Hence all our patents for labor saving and agricultural machinery and innumerable improvements in home comforts meet a ready market in Canada. Inventors and Patentees should therefore not delay to secure their patents in Canada; many good inventions are already pirated by by Canadians, who, against law and right, appropriate United States inventions and have them patented in their own name. After a patent is granted it is extremely difficult to prove who is the first and original inventor. Therefore, inventors and patentees to be safe, you will have to secure your patents in Canada without delay. We have facilities for securing Canadian patents second to none, Our charges for securing Canadian patents are about $65. A model is required.

Inventors and patentees! do not delay and lose your opportunity. Things may change. With model and description of your invention remit $25, and we will prepare all drawings and documents and forward them to you for signature. In about 30 to 50 days we can return your Canadian patent.

DEWEY & CO.,
Patent Solicitors, S. F.

Iron and Machine Works.

THOS. PENDERGAST. HENRY S. SMITH.

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MANUFACTURERS OF

IRON CASTINGS and MACHINERY

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Marine, Stationary and Portable Boilers, Smoke Stacks, Hydraulic Pipe, Oil or Water Tanks, Ore and Water Buckets, Gasometers, Girders, Bridges and Iron Ship Building.

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Repairing promptly attended to at the lowest possible terms.

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ALL STYLES OF FANCY HEAD BOLTS.

HOT AND COLD PRESSED HEXAGONAL AND SQUARE NUTS, WASHERS, BOLT ENDS, TURNBUCKLES, ETC., ETC.

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STEAM, AIR AND HYDRAULIC MACHINERY.

Agents of the Cameron Steam Pump.

Home Industry.—All Work Tested and Guaranteed.

VERTICAL ENGINES,	BABY HOISTS,	STAMPS,
HORIZONTAL ENGINES,	VENTILATING FANS,	PANS,
AUTOMATIC CUT-OFF ENGINES,	ROCK BREAKERS,	SETTLERS,
COMPOUND CONDENSING ENGINES,	SELF-FEEDERS,	RETORTS,
SHAFTING,	PULLEYS,	ETC., ETC.

TRY OUR MAKE, CHEAPEST AND BEST IN USE.

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(SUCCESSOR TO HAWKINS & CANTRELL).

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IMPROVED PORTABLE HOISTING ENGINES,

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MANUFACTURERS OF

Marine Engines and Boilers,

Propeller Engines either High Pressure or Compound Stern or Side Wheel Engines.

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Hoisting Engines and Works, Cages, Ore Buckets, Ore Cars, Pumping Engines and Pumps, Water Buckets, Pump Columns, Air Compressors, Air Receivers, Air Pipes.

Mill Machinery.

Batteries for Dry or Wet Crushing, Amalgamating Pans, Settlers, Furnaces, Retorts, Concentrators, Ore Feeders, Rock Breakers, Furnaces for Reducing Ores Water Jackets, Etc.

Sugar Machinery.

Crushing Rolls, Clarifiers, Vacuum Pans, Air Pumps, Concentrators, Bag Filters, Charcoal Filters, Blow-up Tanks, Coolers and Receiving Tanks.

Miscellaneous Machinery.

Flour Mill Machinery, Saw Mill Engines and Boilers, Dredging Machinery, Oil Well Retorts, Powder Mill Machinery, Water Wheels.

Engines and Boilers of all kinds, either for use on Steamboats and made in accordance with the Act of Congress regulating the same, or for use on land. Water Pipe, Pump or Air Column, Fish Tanks for Salmon Canneries of every description.

Boiler repairs promptly attended to and at very moderate rates.

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Manufactures all kinds of Brass Goods, Plumbing, Brewery and Distillery Work, Gas and Soda Apparatus, Mining Goods, Ship Work, Steam Fittings, Water Gates and Valve Meters, Gauges, Counters, Indicators, etc.

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HERCULES POWDER will break more rock, is stronger, safer and better than any other Explosive in use, and is the only Nitro-Glycerine Powder chemically compounded to neutralize the poisonous fumes, notwithstanding bombastic and pretentious claims by others.

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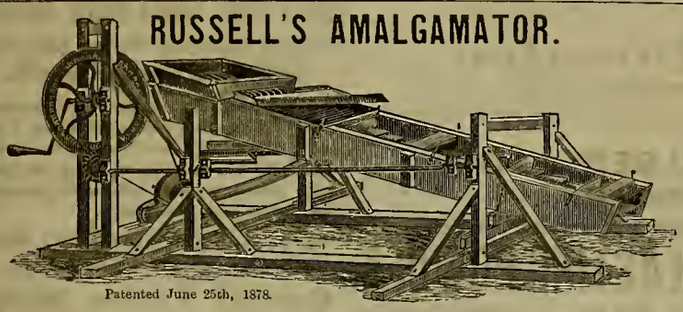

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The entire Lining, Hanging Plates, Riffles and Boxes Amalgamated

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STEEL CASTINGS.

From 1-4 to 10,000 lbs. Weight.

True to pattern, sound and solid, of unequaled strength, toughness and durability. An invaluable substitute for forgings or cast-iron requiring three-fold strength. Gearing of all kinds, Shoes, Dies, Hammerheads, Crossheads for Locomotives, etc. 12,000 Crank Shafts of this Steel now running proved superior to wrought iron. CRANK SHAFTS, CROSSHEADS and GEARING, specialties. Circulars and Price Lists free. Address

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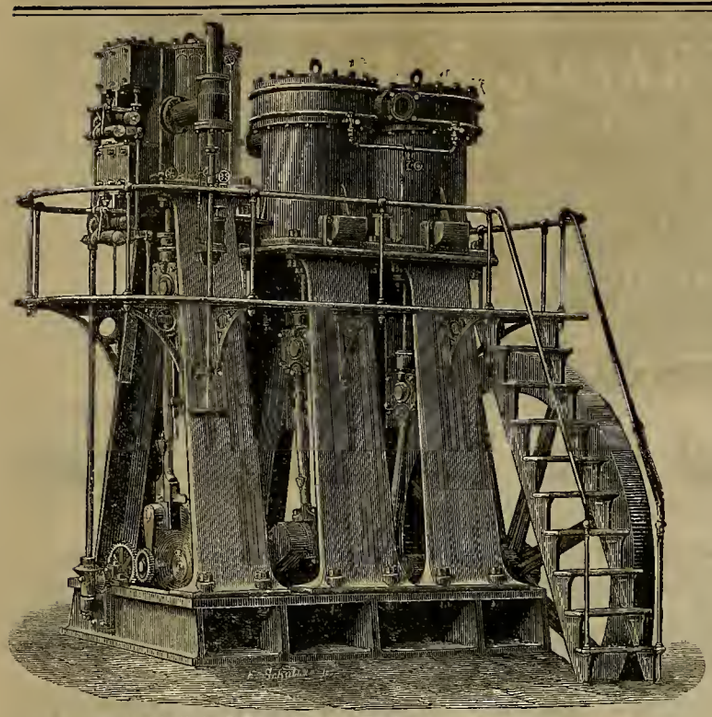

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Absolute certainty in the action of the valves at any speed. Perfect delivery of the air at any speed or pressure. The heating of the air entirely prevented at any pressure. Takes less water to cool the air than any other Compressor.

Power applied to the best advantage. Access obtainable to all the valves by removing air chest covers. Entire absence of springs or friction to open or shut the valves. No valve stems to break and drop inside of cylinders.

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Small Sizes made in Sections not to Exceed 300 lbs.

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BRASS CASTINGS of all kinds,
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For Ventilating Mines and for Smelting Works.

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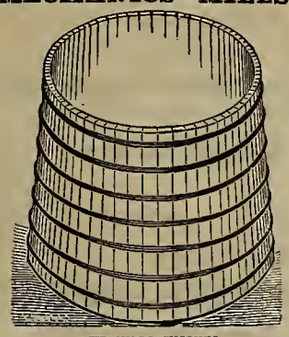

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Stronger, Better and Safer than any other High Explosive.

Judson Powder

IS NOW USED IN ALL LARGE HYDRAULIC CLAIMS.

It breaks more ground, pulverizes it better, saves time and money, and is superseding the ordinary powder wherever it is tried. ☞Triple Force Caps and all Grades of Fuse.

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SAN FRANCISCO, CAL.

VULCAN BLASTING POWDER.

The Strongest, Safest, Most Uniform and Reliable "HIGH EXPLOSIVE" Manufactured on the Coast.

MINERS TESTIFY THAT IT IS FREE FROM OBJECTIONABLE FUMES.

We call the attention of all desiring such a Powder to our various grades, which we are prepared to sell at LOWEST RATES.

No. 1.—Equalling Liquid Nitro-Glycerine in Strength. We recommend this Grade in extremely hard rock, boulders, iron, etc.

No. 2.—Will do the work thoroughly in all but the hardest kinds of rock.

No. 3.—For bench work, pipe-clay, soft and shelly rock, outside work and quarrying.

Single and Triple Force Caps, Fuse of all Grades, Vulcan Powder Thawing Boxes, Batteries and Exploders, For Sale at the Lowest Rates.

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MINING AND SCIENTIFIC PRESS.

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VOLUME XXXIX Number 14

The Mi-wok Indians.

The Mi-wok is the largest Indian nation in California, both in population and extent of territory. Their ancient dominion extended from the snow-line of the Sierra Nevada to the San Joaquin river, and from the Cosumnes to the Fresno. The mountain valleys were thickly peopled as far east as Yosemite; the great and fertile San Joaquin plains, and the banks of the long fish-full streams of the Mokelumne, the Stanislaus, the Tuolumne, the Merced, the Chowchilla and the San Joaquin were anciently crowded with multitudes of these Indians. Even the islands of the San Joaquin were made to sustain their quota, for on Feather Island there are said to be the remains of a populous village. The rich alluvial lands along the lower Stanislaus, Tuolumne and Merced contained the heart of the nation, and were probably the seat of the densest population of ancient California.

The language of the nation was more homogeneous than many others, not half so widely ramified. From the upper end of the Yosemite, traveling 150 miles with the sun, and from the Cosumnes southward to Fresno, there was scarcely a change of a syllable. There are, as always, many abrupt dialectic departures, but the root remains and is quickly caught by the Indian of a different dialect. They were nothing more than the different local pronunciations, such as are apparent in the English language, seemingly entirely different to a foreigner, but only an unimportant, well understood variation to a native.

North of the Stanislaus these people called themselves *mi-wok* ("man"); south to the Merced, *mi-wa;* on the Fresno, *mi-wi.* On the upper Merced the word "river" is *wa-kal-la;* on the upper Tuolumne, *wa-kal-u-mi*; on the Stanislaus and Mokelumne, *wa-kal-u-ma-tuh.* This is undoubtedly the origin of the word "Mokelumne," which is locally pronounced "mo-kal-u-my" (accent on second syllable).

So also *kos-sum, kos-sum-mi* (salmon) is probably the origin of the word "Cosumnes," which is pronounced koz u-my (accent on first syllable). Although the largest, this is probably the lowest nation in California, presenting one of the most hopeless and saddening spectacles of heathen races.

They eat all creatures that swim in the waters, all that fly through the air, and all that creep, crawl, or walk upon the earth, with a dozen or so exceptions. They have the most degraded and superstitious beliefs in wood-spirits, who produce those disastrous conflagrations to which California is subject; in water-spirits, who inhabit the rivers, consume the fish, and in fetichistic spirits, who assume the forms of owls and other birds, to render their lives a terror by night and by day.

In occasional specimens of noble physical stature they were not lacking, especially in Yosemite and other mountain valleys; but the utter weakness, puerility, and imbecility of their conceptions, and the unspeakable obscenity of some of their legends, almost surpass belief.

A majority of all who have any well defined ideas whatever on the subject, believe in the annihilation of the soul after death. He was referred to as *ittek*, representing the memory of a being that once was. While other tribes mitigated the final terror by an assured belief in a Happy Western Land, the Mi-wok go down with a grim and stolid sullenness to the death of a dog that will live no more.

For houses the Mi-wok construct very rude affairs of poles and brushwood, which they cover with earth in the winter; in summer they move into mere brushwood shelters. Higher up in the mountains they make a summer lodge of puncheons in the shape of a sharp cone, with one side open, and a bivouac-fire in front of it.

The only special points to be noted in their physiognomy are the smallness of their heads, and the flatness of the sinciput, caused by their lying on the hard baby-basket when infants.

Major Stephen Powers, in Powell's Contributions to North American Ethnology, from which this sketch is taken, says: "I felt the heads of a rancheria near Chiness Camp, and was surprised at the diminutive balls which lurked within the masses of hair. The Chief, Captain John, was at least 70 years old, yet his head was still perceptibly flattened on the back, and I could almost encircle it with my hands."

For food they depend principally on acorns. They had, in common with many tribes both in the Sierra and in the Coast range, a kind of granary to store them in for winter. When the crop was good and they harvested more than they wished to carry to camp just then, with a forethought not common among barbarians they laid by the remainder on the spot. Selecting a tree which presented a couple of forks a few feet from the ground, but above the reach of wild animals, they laid a pole across, and on that as a foundation, wove a cylinder-shaped granary of willow wicker-work, three or four feet in diameter and twice as high, which they filled with acorns and covered with thatch. There they remained safe. As these were often miles from a village, the circumstance denotes that they reposed no small confidence in each other's honesty. It goes near to refute altogether the frequent allegations that they are a nation of thieves. Now-a-days, they make most of their granaries close to camp, either right on the ground or elevated on top of some posts.

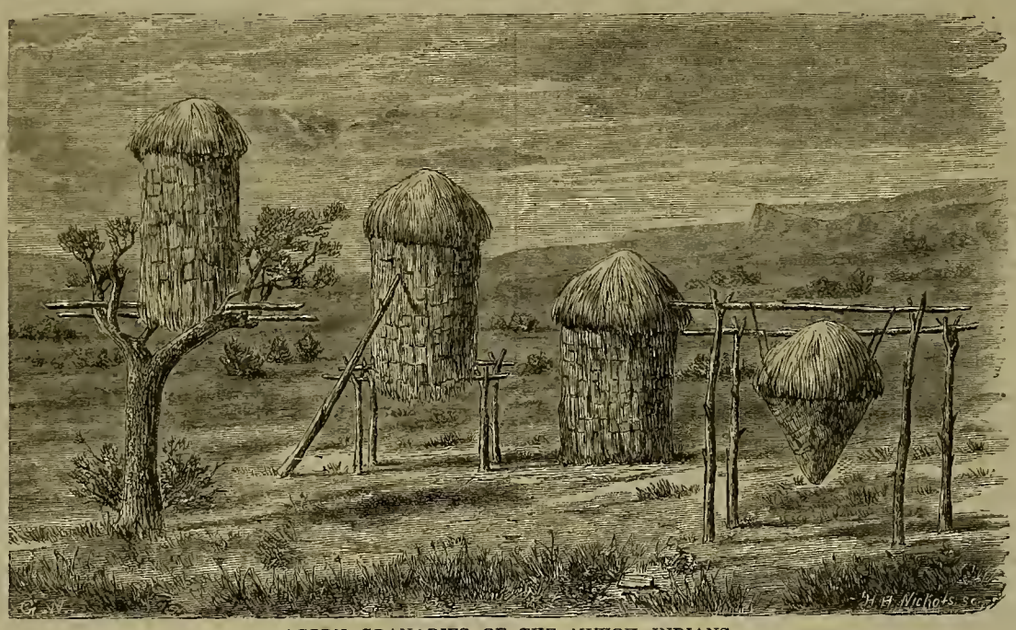
They are very fond of hare, and make comfortable robes of their skins. These are cut into narrow slits, dried in the sun, and then made into a wide warp by tying or sewing strings across at intervals of a few inches. Soap-root is used in the manufacture of a kind of glue, and the squaws make brushes of the fibrous matter encasing the bulb, with which they sweep out their wigwams. With millions of tall straight pines in the mountains the Mi-wok had no means of crossing rivers, except logs or clumsy rafts. All their bows and arrows were bought of the upper mountaineers. White shell buttons, pierced in the center and strung together were used as money, rated at $5 a yard; periwinkles at $1 a yard.

Their chieftainship, such as it is, is hereditary when there is a son or brother of commanding influence, which is seldom; otherwise, he is thrust aside for another. The Chief is simply a master of ceremonies. When he decides to hold a dance in his village, he dispatches messengers to the neighboring rancherias, each bearing a string whereon is tied a number of knots. Every morning thereafter the invited Chief unties one of the knots, and when the last one is reached, men, women and children joyfully set forth for the dance.

Scarification and prolonged suction with the mouth are the staple methods of cure among their shamans or physicians, some of whom are women. In case of colds and rheumatism they apply California Balm of Gilead (*Picea grandis*) externally and internally. Stomachic affections are treated with a plaster of hot ashes and moist earth. The shaman's prerogative is that he must be paid in advance, usually fresh slain deer or so many yards of shell money; the patient's prerogative is that if he dies his friends may kill the shaman.

Their favorite dance is the acorn dance, in which the whole company join hands and dance in a circle. Instead of a dance for the dead, there is an annual mourning (*nut-yu*) in which loud and demonstrative wailings and tearing of hair are indulged in by one or more villages assembled in a circle.

Cremation very generally prevailed among the Mi-wok, but was not universal. The Indians high up in the mountains buried their dead, while those about Chinese Camp always burned. They have a legend that man was created by a coyote, probably the modification of the tradition of some Indian tribes that their nations sprung from the remains of a coyote, in strict accordance with the modern cultured doctrine of evolution.



ACORN GRANARIES OF THE MIWOK INDIANS.

GEORGIA GOLD MINES.—The Louisville *Courier-Journal* says the growth in the gold-mining interests of Georgia has been remarkable in the past few years, and the yield of bullion now goes over $1,000,000 per annum and is rapidly increasing. New mines are being constantly opened. Dr. Little, State Geologist, says that there are unoccupied mines enough to increase the yield to $10,000,000 per annum, without exhausting the quartz in a generation.

RINDERPEST is spreading in Russian Poland.

An Unfortunate Affair.

At a time when there exists so much friendly rivalry among the various mining districts of the Rocky Mountain region, to build up a substantial and enduring business founded upon mining operations, and when the recent glittering developments of yellow metal which have occurred in every quarter have caused capital to seek the most favorable localities for investment, a conflict has arisen in a peculiarly desirable region, the merits of which we are not called upon to investigate. We refer to the difficulty existing between the Miners' Union and the Jupiter-Owyhee party. Whatever may be the causes which brought about the antagonism, however meritorious the principles involved, the idea has gone forth that Bodie has become a lawless community, and the individuals who have brought about such a condition of things will not alone be the sufferers. The entire district will feel it more or less, and feel it for a long time.

Men of means seeking investment are not going to walk up to the cannon's mouth to disburse their money, and there are too many good investments in which the individual will possess a feeling of personal safety of more value to him than the security of his money. The time for a reign of terror in any locality has passed, and even the least thoughtful can understand us when we say that deeds of violence, nay, an intimation, a probability of violence, will drive away that wealth which is so necessary to the development of any business relations. We do not believe that there is any cause to fear for the personal security of any well-behaved individual in any of our mining localities. In the early days when the rich deposits were more concentrated in territory, personal conflicts arose which were unavoidable by reason of the close human contact. Nay, the bullet seemed almost a necessity to preserve order, we will not say law; but there is no such excuse now. The scandal has been created and cannot be recalled. We talk of rights and remedies and agree upon a system to determine them. We spend immense sums in taxes to maintain an official system, and hold out inducements to others to come and dwell among us, and a few persons in an insane moment take the law into their own hands and all our previous labor in building an orderly structure is lost. There is nothing in such a condition of things that may not or that has not occurred elsewhere. Human nature is the same everywhere, and we have been so fortunate heretofore in avoiding any unpleasant differences which pointed towards bloodshed, that we hoped all animosities had been settled in the determination to develop our resources.

The Bodie affair will be regarded as an example of the lawless spirit which has been unjustly said to prevail in mining districts, and it would have been better for the future prospects of the community if both parties had yielded up their grievances to the peaceful settlement of the local government.

MR. BURCHARD, Director of the Mint, has issued a circular with a view to preparing statistics relative to the production and consumption of gold and silver, asking those employed in the arts and manufactures to furnish a statement showing their yearly or monthly average consumption of gold.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS

An Excursion over the Narrow-Gauge Railroad.

EDITORS PRESS:—Excursion parties are one of the safety valves for the pent-up spirits of our metropolis. Through the turmoil of money-getting strife, the distractions of politics, office work, the ennui of evening parties, theater and opera going, club meetings and the like, there comee to every inhabitant of this dusty city visions of broad fields and sunny mountain slopee, clear etreame and dimpling valleys, bubbling springs aud shady dells. These are the ecenes, the originals from the master hand of nature. Copies and imitations of wbich old mesterpieces we have on the canvas in studio and theater and mimic representations in garden, park and fountain. These, the expression of a bright sense and clear perception of the beautiful, satisfy our everyday longiugs, but from them, like cultured etudents of art, we sometimee escape and pay our devotions at the shrines of nature, the source of all true art.

One of the most enjoyable occasions of the season was the Sunday excursion of September 14th, to the Santa Cruz mountains, over the South Pacific railroad, a distance of 67 miles. From Alameda point the road leads over many milee of rich, level land but little above tide water, and destined in time to support a denser population than peopled the marshes around ancient Rome. Here beautiful villas will rise to enrich the landscape, never, we hope, to be despoiled by the Goths and Vandals of a barbarous nation, or crumble, to be finally exhumed by the mousing antiquarians of a strange civilization. Whirling over this tract we entered on the firmer lands of Santa Clara valley. Pleasant farm homes, approached by long shaded avenues, followed each other in rapid succession, pictures of quiet independence, with a background of mountain views, crisp and browned in the summer sun. Santa Clara, the realized dreamland of amateur florists and tree worshipere, was next reached, and we spun a happy three miles to aristocratic San Jose, where we were reinforced by another carload of pleasure seekers. The Union Gatling Band had enlivened the way with ringing strains of music, and with a delicious outburst of the Pinafore frenzy, we steamed against time over the road to Los Gatos, a happy little town in smiling possession of a charming valley. Here we followed a rapid down grade into a wooded canyon, starting with ecanty oake and changing to madrona, laurel, and finally a sprinkling of redwood. A etream wound along by the eide of the track in a glorious tsngle of thickets, the despair of prim gardeners and the pride of the canyon. Quiet pools, elyly euggesting trout, shabby huts and preposterous diggere, wretchedly frugal Chinaman, wood flumes, and a decayed flume of the old San Jose water works, old mountain trails and rugged rocks, a ehort tunnel, with numerous suspicious percussion-like echoes (?), were some of the things we saw in this shifting excursive kadeidoscope. Wright's etation is a handful of houses jammed in between aggressive mountain hights. A shaded stream runs through, and wildness reigns on all sides. Mine host spread an ample repast, and einister appetites made war on the hapless viands. Tables in the neighboring grove were spread with lunches from town, and peaches aud watermelons fulfilled their destiny. Fun and frolic ruled the honr, music resumed, and dancing commenced. The big tunnel near by was visited; it is 6,200 feet long, and witb the 1,600 feet to be completed. An interval of 25 miles of the richest scenery will bring one to Santa Cruz, the Mecca of fashionable pilgrims. The road will be completed by January 1st, and cannot fail of the immense popularity it deserves.

Among the excursionists we noticed Mr. Frank Morton, an experienced railroad man, and W. H. Thompson, an expert accountant, both now in the employ of the South Pacific Coast Railroad Company.

H. E. HALLETT.

Heating by Radiation.

Mr. Leeds, in the *Plumber and Sanitary Engineer*, advocates imitating the radiant heat of the sun in our domiciles. The whole warmth upon the surface of the earth ie received by radiation from the sun. The air is warmed by coming in contact with the warmed earth. The air warmed by this contact with the heated earth rises, and the colder air from above tumbles down to take its place. This forme the great natural ventilation or circulation of air over the surface of the earth, which sustains all life.

For heathfulness, the open fire moet nearly imitates the radiant heat of the sun. The air, warmed by immediate contact with tbe fire, is carried up the chimney. The radiation from the fire passes through the pure air without warming it, bnt warms any pereon or objects within range of that radiation, the air remaining cool and invigorating. All those hot-air contrivances, by which the air becomes hotter than the solid objects in the room, are unnatural.

The Jordan Mine, Mono Co.

In a late issue of the Mammoth City *Herald*, the Jordan mine is described as the most important discovery in Lake district, Mono county, California. The discovery was made but a few weeks ago, lying just west of the Mammoth croppings, and about on a line with the latter's upper tunnel. The discovery has attracted no little attention in the district, and the day after the character and extent of the find became known, and the value of the ore tested, the Jordan sprang at once into the front rank of Lake district properties. The Jordan ie the second oldest location in the district, it being preceded only by the Alpha. It was located in August, 1877, by J. C. Brown and Alfred Jordan, but is now owned by J. C. Brown, F. D. Nichol of Virginia City, Z. W. Taylor and others. It is not yet incorporated, but doubtless will be, now that the value of the mine ie fairly demonstrated.

Mr. Brown began work on the Jordan early in June of this year. A small ehaft was started about 100 feet below and to the westward of the main bunch of croppings. This was sunk about 20 feet through the surface debris, and finally passed four or five feet through conglomerate, when it struck into a stratum of basalt mixed with porphyry and syenite. At a distance of 30 feet stringers of low-grade quartz began to make in, which gave the boys encouragement to keep ou. A few feet further down, and Mr. Brown suddenly struck into a white clay gouge, dipping at an angle of 50° to the southward and eastward. Six or eight incbes of this and the picke went into the ledge of the most beautiful quartz yet found in the camp. For the first three feet this quartz is eolid, compact and fairly alive with metal, assaying from $35 to $350 a ton.

Then it became slightly broken for two feet and mixed with strata of talc, but it again comes in strong and continues so the remainder of the width of the vein, which is well defined by a reddish clay streak whicb carries gold in considerable quantities. From the red clay streak which defines the footwall to the white clay gouge of the hanging wall, is a distance of about eight feet, and from the pitch of the red clay it is seen that the ledge widens as it goes down. It is evident that in sinking the shaft the very apex of the ore body was hit, and that too at a point where nobody expected it.

The purpose of the ownere is now to continue the shaft througb the ledge and on down 50 or 60 feet further, then crosscut and test the ore at that depth. It is believed that it will there be found wider and richer than above. To this end the shaft has been enlarged, making it a double compartment, and better working facilities have been provided.

It is the northern extension of the Alpha, in the tunnel of wbich the eame character of vein has been cut, and precisely the same quality of quartz found, only, of course, being cut at a much greater depth the vein in the latter mine is much wider, and the peculiarities of the ore more pronounced. In the Alpha occurs the same clay gouge, the same strata of talc, and the same reddish clay marking the footwall. All this proves conclusively that tbe ledge is the same in both mines, and that it is one of the most, if not the most important ledge in the district. The following is the result of an assay of four average specimens of rock taken by a *Herald* representative from the bottom of the shaft on the occasion of a recent visit: No. 1 (from next white clay), gold, $21; silver, $336.40. No. 2 (inuer edge of rich streak), gold, trace; silver, $216. No. 3 (quartz mixed with talc), gold, none; eilver, $55. No. 4 (streak next red clay), gold, $41; eilver, $62.10.

New Mining District in Utah.

A correspondent writing from Hoosier Lake, Iron county, Utah, to the Salt Lake *Tribune*, announces the formation of a new mining district, to be known as the Hoosier Lake mining district.

The first piece of ore from this region was found three years ago, and assayed $900 per ton (it was float.) Prospecting has been continued from time to time from then until now, with varying success. Within the last 30 days some veins and deposits have been found and located by parties of prospectors from Panguitch Fish lake and other places. The ores found are gold and silver aud copper, and are considered by old prospectors to be first-class, and will assay into the hundreds. The formation of the country rock is granite, quartz and porphyry. Specimens have been sent to different assayers, chiefly milling ores. Returns bave not yet been received. The ledges, or veins and deposits, so far as prospected, are from 2 to 12 feet in width, carrying all the colors of chloride, ruby and horn silver, which so readily excite the miner. This ie one of the most beautiful regions for mining purposes, in the summer, that any miner ever set foot in. Charming little valleys, with plenty of grass and spring water, surrounded by hills covered with a dense growth of timber, all within a few hours' ride from Panguitch Fish lake, a splendid sheet of fresh water, where the mountain trout do most abound, and angling is real sport. There are quite a number of pleasure-seekers rueticating at the lake, many of whom spend a portion of their time prospecting for rich ores.

Compressed Fuel.

It appears, from the London *Mining Journal*, that slack from coal mines is used to a great extent in France, by being compressed into brick fuel, which is extensively used in the French navy, and considered superior to the English compressed fuel. For steam vessels it has many advantages over coal, whilst a given tonnage occupies much less room than the same weight of coal.

Some important improvements, it may be stated, have recently been made in the manufacture of patent or compressed fuel, by briquette machinery, eimilar, but superior, to that for a considerable time in uee in France, by whicb the material can be cheaply produced, so that the coneumption of it should be considerably larger than it has yet been. Indeed, there should be no diffinlty in manufacturing an article from slack alike suitable for steamships, manufacturers, and for household purposes, at a price much lower than that now paid for either hard or eoft coal. This will be apparent from the almost nominal charge now made for slack, from which large quantities of excellent coke are made.

In France, in connection with the navy, both coal and patent fuel have been tried against each other, and the Minister of Marine bas found the latter to be most advantageous in comparison with either Cardiff or Newcastle coal. He states that a better fuel was produced in briquettes, whilst there were the still further advantagee of greater facility in loading, stowage of a larger quantity, diminution of loss from dust, and capacity to bear exposure. Consequently, the compressed fuel was generally adopted in the French navy. The best coal for the purpose is that of the Anzin mines, in the north of France. The Anzin Company, one of the largest working the coal in the northern basin, has a compressed fuel factory, with 4 revolver and 2 Middleton presses at St. Vaast, where about 500 tone a day· are turned out. The produce is absorbed by the French navy.

The Aniche mines, in the eame direction, are also very extensive, and in connection with them are the Lomaine Patent Fuel Works. The material worked up is from 70,000 to 80,000 tous of small coal, and 5,000 to 6,000 tons of Englieh pitch. The works make nearly 250 tons of fuel in 24 hours, and comprise a steam-engine of 50-horse power, three boilers of 45-horse power each, measuring machine for the pitch and coal, two washing machines on Berard's eystem, a Carr's disintegrator, a centrifugal drying machine for molding the fuel on a system devised especially for the work by one of the directors and partners, M. Bourriez. The compression is obtained by the motion of a pieton on a rectangular mold, which is constantly fed by a mixture of the small coal and pitch in a soft or pasty state, so that there is constantly produced a continuous and a solid band of fuel. Outside the mold the material ie separated at each stroke of the piston into rectangular blocks, which are then completed and ready for loading into the wagons. Most of the fuel made is for the French navy. For carrying on the necessary work about 50 workmen are employed. The same company have three other factoriee, at Erquielinee, Hasard, and Marchiennes-au-Pont; so that the annual production of the various establisbments is upwards of 300,000 tons a year, nearly the whole of which is consumed inside Freuch territory. This, we believe, is more than is produced by all the makers in England, despite the vast quantity of small coal that is made, and the almost nominal price it is eold at. But there are several other factories in France for the manufacture of compressed fuel besides those enumerated, one of these being in connection with the Bethune mines, established near to the wharf from which the coal is shipped, and produces from 18,000 to 20,000 tons a year.

It will be seen that the mannfacture of compressed fuel has become an important industry in France, not only being largely used by the navy in preference to the best eteam coal, but for household and other pnrposes as well.

But one of the principal drawbacke to the pateut fuel has been the heavy percentage of clinker and ash it has left after burning. But by a judicious selection of small coal, and having it cleaned and washed, there is very little doubt but that it would meet all the requirements of the Admiralty, as well as of steam coneumers generally, for it has been admitted by the dockyard authorities to have some important advantages, for in their report they say: "We think the patent fuel would resist deterioration when exposed to the weather much better than ordinary coal, and on this account might be found specially suitable for shipment to the foreign coal depots, and that without difficulty it might be eecured of a caloric value nearly, if not quite, equal to the best steam coal now supplied."

FIRE-DAMP DETECTOR.—Prof. Forbes before the recent meeting of the British Association reported that the committee in charge had conetructed two instruments for detecting fire-damp, the principle in the construction being founded upon the fact that sound traveled quicker in light gases than in dense ones, indicator was ahle to detect. Some alterations were recommended in the instrument, and the committee added an opinion that it would be very nseful in ensuring the safety of mines.

Santa Fe.

Governor Amey, of New Mexico, speaking of Santa Fe, says:

The city of Santa Fe stands upon botb sides of Santa Fe creek, a small river heading in the lake on the top of the mountain 12 miles to the east, and running westerly into the Rio Grande del Norte, 14 miles from the city. From it the fields and gardens in tne valley are irrigated for cultivation, the whole volume of water being usually, during the irrigating season, diverted into the branching acequias or irrigating canals. The city residences and other buildinge are almost universally of the Mexican etyle, built of adobes or sun-dried brick, one story high, are warm in winter, and cool in summer, and are, withal, quite comfortable. It has been aptly said that the city, when viewed from either of the fine natural eminences overlooking it, presents the appearance of a large collection of brick kilns. Huge spurs of the Rocky mountains rise in the immediate vicinity of the northeast, the east and the eouth-east, and loom in the distance to the northwest, the west and the southweet, a series of low table-lands lying to the north, the whole presenting an interesting landscape. Situated at an elevation of 6,862 feet above the eea level, the climate ie very agreeable, the atmosphere very rare and pure, and the ealubrity of the place unsurpassed. It enjoys, on this account, a widespread and very enviable reputation. The population is now not less than 6,500. Of these, fully 5,500 are persons of Spanish or Mexican descent, speakiug the Spanigh language, the balance being wholly Americane and Europeans—the entire population being conventionally divided into two classes, the "Mexican," or Spanish-speaking, and "American," or Englisb-epeaking people, the latter class being composed, really, of a majority of foreign-born persons, among them a large proportion of Jews.

The plaza, or public square, in this city, north of the river, comprising an area of about two and a half acres, contains, enclosed with pailings, inside the streets, a beautiful park of trees, covering a space of about an acre and a quarter. The trees are mainly cottonwood, the eight large ones forming the entire north tier having been set out in the spring of 1844 by Mariano Martinez, the Governor of New Mexico, and others in 1863 at the private expense of the citizens. The plaza is surrounded on the east, south and west sides with good adobe buildings, the principal mercautile and other business houses of the city, and on the otber side stands the old "Palace," containing now the Governor'e mansion, the United States Designated depository, the United Statee and Territorial court rooms, the Legielative hall, the Territorial library, and the Territorial Attorney-General's office.

It is contended that Santa Fe is really the oldest-settled town upon the whole territory of the United States. Ae the city of Mexico today is but the Aztec pueblo of Tenochtitlan of Montezuma, so is Santa Fe but the old pueblo of Cicuye of Coronado. Santa Augustine, in the State of Florida, settled in 1565, was conceded the distinction of being the oldest until the acquisition of New Mexico and its capital, Santa Fe, by the treaty of Guadalupe Hidalgo, in 1848, when the latter assumed that rank by virtue of being, when the Spauiards first visited it, in or about the year 1542, a populous, regulated Indian pueblo or town—one that had been in existence there is no knowing how many decades or how many centuriee.

Big Blue Lead in Nevada.

The Gold Hill *News*, undor the heading of "Gravel Gold Mining," saye that the "Centennial," a new mine, is right on the track or channel of the old blue lead. The exhausting of ehallow placers in Califoruia led to deep mining, worked by hydraulic process, long tunnels, and deep shafts. Thus it was that hy degreee the great ancient river channel, better known as the "Big Blue lead," was developed and traced from north to south throughout the gold region. This famous lead contains some of the richest and most permanent of the gravel gold mines of California at the present time; mines that will last for many long yeare to come.

The Centennial is situated in Washington township, Nevada county, California, 14 miles above Nevada City, in a range of hills at the head of Jefferson ravine, between the South Yuha river and Deer creek. It comprises a tract of heavily-timbered land 800 acres in extent. The mine has been considerably prospected under the enperintendency of Major Downie by about 3,000 feet of tunnel, developing some very good gravel streake carrying heavy wash gold, as well as by shafts, and the dip of the gravel having been obtained, a prospecting tunnel to the eastward is now being run, in order to ascertain the best and most advantageous point to etart a main working tunnel directly into the gravel deposit, low enough to secure the best possible drainage. A strong, permanent stream of pure, cold water, of 12 or 15 miners' inches, flows from the old tunnel, and is, without doubt, from the great channel or river itself. This stream will prove of great value and importance in the gravel washing. The great "Blue Lead," which has been traced for hundreds of miles, has already given to the world over $300,000,000, and now yielde $10,000,000 annually; consequently the chances for the Centennial turning out rich by and hy are pretty well assured.

MECHANICAL PROGRESS.

Terrestrial Magnetism and Electricity.

Profs. Ayrton and Perry, of the College of Engineering, Tokio, Japan, communicate to the *Philosophical Magazine* a short note, proposing the hypothesis that the phenomena of earth currents, terrestrial magnetism, and atmospheric electricity are due to the fact that the earth is an electrified condenser, whose capacity or potential is continually changing on account of its rotation and annual orbital motion, the successive cooling and warming of the air, the formation of clouds and rain, etc., etc. These changes produce electric currents tending always to restore the equilibrium, whence follow the phenomena in question. They suggest that observations of atmospheric electricity may be used to predict atmospheric changes.

William Leroy Brown describes, in *Nature*, a new lecture experiment, to show the action of terrestrial magnetism. A rectangular frame of light wood, carrying 20 coils of insulated wire, was suspended in a horizontal position from the pans of a balance, so that the long sides of the rectangle were at right angles to the beam; and mercury connections were arranged at the middle of the short sides, so that a current could be sent through the wire. This apparatus being placed with the long sides of the rectangle perpendicular to the magnetic meridian, when the battery current passed from east to west on the northern side, and from west to east on the southern side, the north side would be attracted and the south side repelled by the earth currents, both influences combining to deflect the beam of the balance. On reversing the current the deflection was in the opposite direction.

It would seem from the above, which we clip from a late *Scientific American*, that the proposed hypothesis of Profs. Ayrton and Perry and the mechanical contrivance of W. Leroy Brown described, are new discoveries. The fact is both are old, substantially the same machine having been used for a long time by Prof. Neri, of St. Ignatius College, San Francisco to solve the phenomena mentioned in the above hypothesis, which is not strictly a hypothesis.

A WONDERFUL GAS MACHINE.—Mr. J. T. Guthrie, of Leesburg, Ohio, is said to have recently patented a machine for utilizing the gas from bituminous coal that is otherwise lost with the smoke through the flues and chimneys. The machine is very simple, and can be attached to a common cooking or heating stove; and the advantages claimed for it over all previous inventions are such as to render it one of the greatest improvements of the age. Any person can handle it easily, and the same fuel that cooks your breakfast, will produce an abundance of pure gas, sufficient to illuminate your house during the night, without any expense whatever. Mr. Guthrie also claims the right of attaching it to furnaces, grates and any and all places where coal is used for fuel and heating purposes. It is said that Mr. Guthrie has proposed to the Cincinnati Exposition Commissioners to light the entire Exposition building with as good and pure a quality of gas as can be produced in the city gas works, and this by using the same fuel that heats the boilers of their power engine, without the cost of one cent for the fuel. This invention is in successful operation in Leesburg; and the inventor is visited daily by hundreds of people to see the wonderful machine. All, so far, bear testimony to its wonderful merits and general utility. The inventor claims that good, pure gas can be produced by the machine at a cost not to exceed 20 cents per 1,000 cubic feet, and earnestly invites practical men from all parts of the country to come, see and examine the workings of his invention.—*American Manufacturer.*

NEW POLYGRAPH.—The latest method for the rapid reproduction of letters, drawings, etc., has been brought out in France, and is made as follows: A plastic mixture, composed of 500 parts (by weight) of white gelatine, 500 parts of glycerine, 50 parts of glucose, 50 parts of white glue, and 350 parts of water, is poured hot into a shallow tin box of suitable size. The ink used for writing or drawing is made by adding to a suitable quantity of water 20 grams of violet aniline and 300 drops of alcohol. The ink is allowed to dry on the paper, which may be of an ordinary quality, and then the written side is laid on the plastic paste and is gently pressed on with the hand. After waiting for a minute the paper is neatly raised, and the writing will be found to have been transferred to the surface of the paste. From this as many as 50 copies can be taken without the aid of the press. What is left of the ink is carefully washed off by means of a warm sponge.

AMERICAN ELEVATORS IN FRANCE.—It is now proposed to introduce American grain elevators into use in the port of Havre, a committee, composed largely of American residents in France, having been recently formed for this purpose. It is curious that so important a seaport as Havre, where enormous quantities of grain are received annually, should be destitute of the simple and well-known method of handling grain, such as is afforded by the elevator, but this is the fact, the only mode of transfer being the primitive one of carrying on men's backs, and the grain is left in heaps upon the quays, exposed to loss by weather and by theft.

DEVICE FOR COMMUNICATING BETWEEN ENGINE AND CARS.—An English journal notes the exhibition by Mr. T. T. Powell, Harrogate, of a working model of railway train, line and signal cabins, showing the operation of his appliances for securing direct and interchangeable communication between passengers, guard, driver and signalmen whilst the train is running. The invention consists of a light insulated metal rail or bar placed in the center of the four-foot way, extending from one block station to another, and united to these stations by insulated wires in connection with batteries and instruments placed in the signal cabin, the station master's room or any other convenient place. In combination with this insulated rail a trailing runner or drag is placed under the engine and guard's van, constructed in such a manner as to be in constant contact with the insulated rail, and connected with batteries and speaking or signaling instruments upon the engine and in the van. By these means the signalmen, guards and drivers will be enabled to communicate interchangeably with one another and with the station at each end of the block. This appliance not only gives these unusual facilities to the officials, but affords the same privileges and safety to passengers. This is accomplished by fixing under each carriage a suspending runner or drag with a direct and easy communication from the inside of the passengers compartment by a connecting cord. In case of danger of alarm, the passenger, by pulling the connecting cord, at once releases the runner, which falls upon the insulated rail or bar and immediately gives the alarm to driver, guard and the two signalmen at either end of the block within which the train is running. The system can be easily and effectively applied where the present block system is in use.

FLEXIBLE LINING FOR COAL-OIL LAMPS.—An ingenious invention has recently been introduced in Maryland to ensure safety in the use of coal-oil lamps. It consists of a lining made of flexible material, which prevents the lamp becoming foul by the expansion of the material of the lamp, permitting oil to exude and soil the hand, or whatever it may touch. A broken lamp becomes harmless, as there is neither gas from the oil nor oil itself to spread destruction to everything it comes in contact with. Careless handling will not bring the oil in contact with a hot lamp. The lining is a natural receptacle for fluids, a non-conductor of heat, and is improved in several essentials by being filled with oil. It is strong enough to resist rupture from much rougher handling than can be expected from an article designed for this purpose. No change is necessary in lamps now in use. The attachment is made to fit any coal-oil lamp. An accommodating coupling, or joint, enables any one to change their lamp from a foul and dangerous to a perfectly safe, clean and harmless light.

MEASURING DISTANCE TO REMOTE OBJECTS.—The desirability of some convenient and reliable means for measuring distance to a remote object, has set several ingenious people to work to invent an instrument for that purpose. Mr. John Boger, of Powhattan Point, Belmont county, O., has recently patented an improved instrument that promises to effect this object. The invention is based upon the general principle of the employment of two right angular bars, one of which is provided with a sighting glass, and is directed toward the object, and the other graduated and provided with another instrument, which, when adjusted to a certain position upon this bar and turned to the object, indicates by its angle at such position the distances which the different angles and positions together indicated, being previously determined by careful measurement.

A NEW STEAM BOILER.—An English engineer named Whitehead, recently exhibited at Owleston, near Sheffield, a boiler made on a new plan. In making this boiler a ring of steel is cast and heated. Then it is placed upon a large roller, and by the aid of smaller rollers it is enlarged to the requisite dimensions. The ring is run from one end of the roller to the other, and is returned by reversing the machinery. The other portions necessary for the completion of the boiler are subsequently put on with bolts. The machinery is rather expensive, and it is its cost which is said to be the point upon which the success of the invention hinges. The inventor claims that within six hours he can construct the shell of a boiler of a more durable nature than those now used.

AUTOMATIC ENGINE.—A new automatic pumping engine is in operation at the Providence (R. I.) water works. It has 10 cylinders, five for water and five for steam, arranged alternately in a circle. It possesses an enormous capacity, but it will, without attention from the attendant, do the duty of pumping either for a single faucet or for a dozen steam fire engines. The cylinders are all connected to a single central upright shaft, which automatically either makes one revolution in five minutes or 25 in one minute, according to water required. If the fire burns low, the engine will open the damper; if this is not sufficient, it will put on the blower.

THERMOMETER PLATE STAMPING.—Messrs. Robinson & Burr, machinists and founders, of Champaign, Ill., have recently completed a very intricate machine for graduating and stamping thermometer plates. The machine stamps the figures from 40° below zero to 280° above, makes the long and short marks, and has a range from 30° to three-eighths of an inch to 30° in an inch. It will make four gross of plates per day.

SCIENTIFIC PROGRESS.

Rusting of Iron.

Dr. J. Treumann, of the Hanover Technical High School, says, in *Iron*, that the phenomenon of rusting, was, to within a very recent period, commonly explained in the following way: Iron, covered with a thin layer of water, and exposed to the influence of atmospheric air, is changed on its outer surface into hydrated peroxide by taking up the oxygen dissolved from the air by the water, and then forming an oxide of iron, which combined chemically with one part of the water. But a few years ago, Calvert proved that, besides oxygen and water, the carbonic acid, always present in the atmosphere, was an essential factor in the process of rusting. He showed, also, that a proto-carbonate of iron was an essential element of iron rust, and instituted a carefully conducted series of experiments, which resulted in proving that iron rusts most easily in a mixture of *damp* carbonic acid and oxygen; that, contrariwise, it does *not* rust when exposed either to perfectly dry carbonic acid and oxygen, or to damp carbonic acid, or to damp oxygen. Iron exposed to the influence of pure oxygen does not rust, so far as Calvert's experiments go. If part of a bar of iron is dipped into water below oxygen, this part becomes covered with hydrated peroxide. The hydrogen found in the upper part of the vessel, which was at first full of oxygen, only justifies the conclusion that the oxide of iron originates in the decomposition of the water, effected by electrolysis. In iron are constantly pressed small quantities of other metals, and to these must be attributed the creation of electric currents, which first decompose the water and then rust the iron.

Rusting is therefore in all cases to be attributed to the simultaneous action of carbonic acid, water and oxygen, as well as under certain circumstances, decomposition of the water occasioned by the presence of metallic impurities in iron.

The beginning of the action of rusting is accelerated where the damp air to which iron is exposed contains small quantities of sulphureted hydrogen, the latter causing the formation of sulphide of iron, which is presently converted by oxidation into a proto-sulphate. Small quantities of chlorine, muriatic acid or acetic acid favor the formation of rust.

That iron which is exposed to the influence of water containing salts, and especially water which contains solutions of chlorine compounds, especially chloride of magnesium, chloride of sodium, ammonium chloride, potassium chloride, barium chloride, calcium chloride, rusts in a very energetic manner as soon as atmospheric air is admitted to it, is a fact which has been lately corroborated over again by A. Wagner, whose experiments are detailed in Dingler's *Polytechnisches Journal.* This observation deserves the greater attention from the fact that the benefit derived by purifying the feed-water of steam boilers from sulphate of lime by means of barium chloride may be completely neutralized by the presence of compounds of chlorine which corrode the boiler plate.

The smoother the surface of the iron the slower does rusting go on. Rust always makes its first appearance in fissures and crevices filled with hammer scale and spreads itself in all directions from those parts first affected. The differences in the formation of rust exhibited by the various kinds of iron is remarkable. Hard foundry pig, richest in carbon, resists oxidation, the longest; pure iron, poor in carbon, rusts very quickly under parallel conditions.

The fact has often been proved by experiment, that iron does not rust if it lies under water containing small quantities of potassium, soda carbonate, lime, ammonia, or borax. Iron can also be protected from rust by means of solutions of potash or soda. The protection granted by these agents will last for months, if a certain measure of dilution is not exceeded; but ceases when these solutions have become completely saturated with carbonic acid. The latter circumstance seems to warrant the assumption that the effectiveness of these agencies is attributable to the property of free alkalies, themselves containing carbonic acid, to enter into chemical combination with this body, and thus to prevent it from acting on the iron. Practically this principle is made use of principally for the protection of boilers which have to lie idle. They are filled with milk of lime, or solutions of soda are used, with the object of the prevention of rust. Of course, this protective solution must be renewed from time to time, since, when saturated with carbonic acid it loses its virtue.

FRENCH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.—At Montpellier, on the 28th of August, the annual congress of the Association for the Advancement of Science was opened. The President (M. Bardoux), in the course of his inaugural address, pointed out that the modes of teaching should follow the developments and modern society, and that the old method, in which memory played the principal part, should be abandoned. What was now required was a system of instruction which developed the judgment and set it on its guard against chimeras, without extinguishing the cultivation of the beautiful. This was the urgent reform which secondary instruction needed.

Chemical Denudation.

T. Mellard Reade, in his book on "Chemical Denudation in Relation to Geological Time," says:

The phenomena of sub-aerial denudation now holds an important place in geological theory, and the changes of contour and surface which were formerly attributed to subaqueous influences have come to be chiefly ascribed to the action of glaciers and torrents. In the main, there is no doubt these second thoughts of the geologists are the most accurate; but the action they have in view is mostly mechanical, and the chemical action of acids held in solution by the rain or in the atmosphere has not been so much taken into account. In fact, although the amount of mechanical denudation by rain has been carefully estimated, and computations of time founded upon it, no attempt has, up to the present time, been made to estimate the soluble constituents annually removed from the earth's crust.

This the author of the present treatise essays. Without following him through his calculations a few of the results may be stated. He considers there is ground for the provisional assumption that the effect of soluble denudation by rain in England is to lower the surface about a foot in 13,000 years. Then, as to the bearings of these changes on the question of geological time, he shows that, by even a much lower estimate of the rate of denudation, it would take 25 millions of years to accumulate the quantity of salphate of lime and magnesia contained in sea water, and 200 millions of years to renew its chlorides; and on these and other grounds that the sedimentary crust of the earth, taken on an average at 10 miles thickness throughout, must have taken, in laying down, on a very moderate estimate, 600 millions of years—a period, by the way, amply sufficient for all the changes of the evolutionists.

BLOWING-OFF STEAM BOILERS.—A French essay has the following on blowing off steam boilers: Those who possess externally-fired boilers, working only by day, have all observed that the fire being covered by night, and the doors closed, the pressure rises during the night, often sufficient to open the valves. This shows that the masonry, being at a much higher temperature than the boiler which it envelops, imparts to it some of its heat. The same effect of heating the boilers is produced, to a less degree it is true, but nevertheless to some extent on the outer jacket of internally-fired boilers. It is consequently injurious to empty boilers soon after having stopped them, because after emptying, the plates would be heated by the action of the masonry. It is well to admit a current of air through the flues some hours after the stoppage of the generator, and not to empty it before the flues become cooled to a temperature below 150°. When the flues are not too hot, no serious inconvenience is experienced in emptying the boiler under pressure. We do not say at high pressure, as for a boiler the pressure of which would be 5 kilogs, the temperature of the water being 152°, a greater quantity of steam would be generated during the process of emptying; we think that at a pressure of one kilog, the boiler could very well be emptied. In internally-fired boilers, as there is no masonry to cool in the furnace tubes, it would be well to admit the current of air intended to cool the masonry behind the boiler, as in this case the furnaces would be cooled more rapidly than the jacket. We have sometimes seen owners empty their boilers almost immediately after the fires have been extinguished, clean them with cold water as soon as they were empty, and keep up a current of water so that the workmen might work there. Boilers of small dimensions sometimes resist treatment, but in large boilers it will be seen that unequal contractions must take place, which burst the rivets.

MICROMETRIC.—Apropos of the forthcoming meeting of the microscopists, Mr. G. Fasoldt, an optician of Albany, some time ago announced to the scientific world that he was able to manufacture a microscopic slide, called "Micrometric rulings," in which, by the aid of a diamond, he had cut 120,000 clearly defined lines to the inch. This seemed an impossibility, and microscopists in this country and Europe obtained specimens mainly for the purpose of proving the falsity of the statement. Several were able to see 45,000 lines, the rest being invisible to them. Fasoldt's son said he had seen 90,000 of the lines, but envious persons declared he imagined all above 45,000. Dr. Rezner of Cleveland, a gentleman of great scientific ability and labors, has discovered a method of so illuminating the rulings that they are easily read. On Monday last, Dr. L. Younghusband, of Detroit, visited Dr. Rezner at his office in Cleveland, and there saw the wonderful sight of 120,000 lines to the inch, by the aid of Zentmayer's microscope and Spencer's one-sixth objective. Present at this examination was Dr. Dutton, an eminent physician, who also saw them. Dr. Younghusband regards this slide of Fasoldt's with Dr. Rezner's illuminator, as one of the greatest wonders of the age, and one which will enable the faithful students and workers in microscopy to accomplish still greater victories in their department of science.—*Buffalo Courier.*

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Sept. 11		Week Ending Sept. 18		Week Ending Sept. 25		Week Ending Oct. 2.	
Alpha	27½	24	29	19¾	20¼	17½	17¾	14¼
Alta	6⅝	6	6⅞	6¼	6⅝	6	8	5¼
Andes	1	90c	1.05	1	1.60	1.05	1.20	95c
Alps	....	....	....	....	....	....	....	....
Argenta	80c	75c	75c	70c	1.10	75c	1.60	90c
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	....	....	20c	....	20c	....	....	....
Baltimore Con	50c	....	60c	50c	....	....	....	....
Belcher	4⅝	4.55	4¾	4.40	4.60	4½	4⅜	3.60
Belmont	80c	65c	55c	....	60c	....	65c	60c
Best & Belcher	19¼	18	18¾	17¼	19⅝	17¾	18⅜	17¼
Bullion	8½	7⅜	8¾	7⅜	8	7¼	8½	7⅛
Bechtel	1.30	....	1.45	1.20	1½	1.40	1½	1
Belle Isle	3.90	3.55	4.45	4.15	5½	4¾	5⅜	4.85
Bodie	10⅞	10¼	14¼	11	14⅞	13¼	14	13¼
Benton	4.10	3.80	4	3.60	3⅞	3½	3.40	2⅞
Bulwer	9¼	8¾	10½	8¾	12¼	11¼	12	11¼
Boyle	....	....	....	....	....	....	....	....
Black Hawk	1.05	75c	1	85c	1	80c	1	75c
Belvidere	1	80c	1	80c	90c	80c	85c	80c
Booker	1.20	1.05	1.35	1.05	1½	1.05	1	95c
Caledonia	2¼	1.85	2.10	1.70	2¼	1⅞	2⅝	2
California	4.95	4¼	5	4.65	6¼	5¼	5½	5¼
Challenge	2¼	2⅜	2.60	2.25	2.30	....	2.30	2.10
Chollar	7¾	6¾	7¾	6⅝	7¼	6¾	7¼	6⅝
Confidence	11½	10¾	11¼	10	10¾	10½	10⅝	9
Con Imperial	2.05	1⅝	2	1.30	1½	1.45	1.35	1.20
Con Virginia	4.90	4⅜	4.95	4⅜	6⅜	5½	5⅜	5¼
Crown Point	3.90	3.70	3.95	3.70	3.70	3¼	4.30	3⅜
Con Washoe	....	....	....	....	....	....	....	....
Champion	40c	30c	30c	25c	30c	20c	40c	30c
Concordia	10c	5c	....	....	5c	....	20c	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	20c	15c	50c	20c	60c	45c	1½	55c
Eureka Con	16¾	16½	29	17¼	25¼	21	26	22¾
Exchequer	7¾	6½	7⅝	5⅞	6⅞	5⅜	8½	5
Endowment	30c	....	35c	30c	50c	40c	55c	35c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	2¾	2½	2.90	2¼	2½	2	2.55	2
Gila	60c	55c	50c	40c	35c	30c	25c	15c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	12	....	8	....	....	....	13	12
Goodshaw	50c	35c	40c	....	35c	25c	40c	25c
Gould & Curry	12⅞	11⅝	12¼	11¼	12	11¼	11⅝	9⅝
Hale & Norcross	15	14½	14⅞	13⅝	14½	13½	13½	11⅞
Hillside	1.85	1.65	2	1.80	2	1.85	1.85	1½
Highbridge	....	....	....	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	10c	5c	5c	....	5c	....	15c	....
Independence	2.20	2.05	2.15	2.05	2.10	1.80	2	1¾
Julia	4.90	4.15	4¾	4.20	4.55	4.10	4½	3¾
Justice	4½	2¾	4¾	3½	4	3.55	3¾	3.20
Jackson	4	....	....	....	4¼	4	3.90	....
Joe Scates	....	....	....	....	....	....	....	....
K K Con	2	1⅞	....	....	....	....	....	....
Kentuck	4½	4	4.40	4.20	4½	4½	1.30	4.20
Kossuth	20c	....	10c	....	....	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	60c	50c	55c	40c	1.10	45c	1	70c
Lady Wash	1.30	55c	1½	1	1.20	1	1.05	99c
Leopard	35c	25c	25c	20c	60c	10c	60c	65c
Leviathan	55c	25c	60c	50c	60c	50c	60c	45c
Leeds	70c	....	50c	....	75c	....	65c	....
Lee	....	....	....	....	....	....	....	....
May Belle	....	....	25c	....	25c	....	....	....
Modoc	....	....	....	....	1½	1	1½	1.20
Manhattan	3½	3	3.40	2¾	3¼	....	3	....
Martin White	2.10	1.20	1.80	1¾	3¼	2	2	1.90
McClinton	75c	65c	60c	55c	80c	50c	65c	60c
Meadow Valley	....	....	....	....	50c	....	5c	....
Mexican	37	33	38¾	36½	38¾	37	37	31
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	....	....
North Con Virginia	8	7½	8	....	8⅞	8½	9	8
New York	70c	60c	70c	60c	65c	60c	60c	45c
Northern Belle	4	4⅜	4	3¼	4	3¾	3.95	3⅞
New Coso	....	....	....	....	....	....	....	....
Navajo	30c	25c	50c	30c	40c	30c	40c	30c
Occidental	1.65	90c	2.05	1.70	5¼	2.60	3¼	2.10
Ophir	38¼	35	42¼	39¼	44	42	43½	36
Oriental	60c	25c	45c	10c	20c	15c	15c	....
Overman	10	8¾	10	8¼	9½	9	9¾	8⅞
Panther	....	....	....	....	....	....	....	....
Phenix	2½	....	3	2½	....	....	....	....
Phil Sheridan	....	....	50c	30c	40c	....	40c	....
Potosi	6¼	5½	6½	5¼	6	5⅞	6	5¼
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	75c	65c	75c	65c	1½	95c	1½	1.10
Richer	30c	25c	40c	25c	....	....	....	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	15¾	14½	15	13⅝	14⅞	13⅜	14½	12
Seg Belcher	23	22½	23	20	24	22	22	....
Sierra Nevada	47½	41	48	45	48⅜	46¾	49	42¾
Silver Hill	2	1.60	1.80	1.60	1.65	1.40	1½	1¼
Silver King	4½	....	....	....	4⅜	4½	6	5¼
Silver Prize	10c	....	....	....	....	....	....	....
Succor	10c	5c	10c	5c	5c	....	....	....
Summit	1½	1¼	1.70	1¼	2	1¼	1⅝	1¼
Scorpion	3	2½	3	2.80	4	2.95	3.80	3.10
Solid Silver	....	....	25c	....	65c	25c	50c	30c
South Bodie	35c	30c	30c	20c	30c	25c	25c	20c
South Standard	10c	....	10c	5c	5c	....	10c	5c
Star	40c	....	50c	45c	80c	70c	75c	50c
St. Louis	40c	....	....	....	40c	....	....	....
Syndicate	6	5⅜	6	5¼	5⅞	5¼	5⅛	5
Tioga Con	3.60	2.95	3	2¾	3.70	3	3.05	2⅞
Tiptop	1	90c	85c	80c	1.05	1	1½	1.10
Trojan	40c	25c	40c	35c	25c	20c	30c	20c
Union Con	73½	59	75½	69¾	71	70½	72¼	61
Utah	21	18¾	20½	18½	20¾	19½	20½	17½
Vermont Con	....	....	....	....	....	....	....	....
Ward	2.95	1.95	2.60	2.35	3.10	30c	3½	2.90
Wells Fargo	10c	5c	10c	5c	10c	....	5c	....
Woodville	45c	35c	45c	35c	40c	35c	....	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	18	16¼	18	16¼	16⅞	16¼	16½	15

Sales at S. F. Stock Exchange.

Friday A. M., Sept. 26.

190 Alpha......17⅞@17¾
150 Alta......5⅞@6
400 Andes......1.20@1.15
705 Bullion......7⅞@8
110 Best & Belcher...17⅞@18
270 Benton......3.40@3½
310 Belcher......4.30@4⅜
10 Confidence......10¾
5 Challenge......2.30
355 Crown Point.....3⅜@3.45
1300 Con Imperial......1.35
380 Con Virginia......5¾
130 Chollar......6⅝@6½
25 California......5⅞@5¾
400 Caledonia......2.45@2⅜
300 C Dorado......2
925 Exchequer......6@5¾
100 Flowery......70c
235 Gould & Curry...11½@11⅝
275 Golden Gate......3½@3¾
120 Hale & Nor......13⅝
50 Justice......3.70
105 Julia......4½@4.15
60 Kentuck......4½
300 Lady Bryan......95c@1
200 Leviathan......50c
10 Lady Wash......1.05
1000 Mackey......1.70@1.65
265 Mexican......37
50 North Con Vir......8½
215 N Bonanza.....1.70@1.55
100 New York......60c
160 Occidental......3½
100 Overman......9
245 Ophir......43½@43½
130 Potosi......5⅞@5½
220 Plutus......2¼
100 Phil Sheridan......40c
115 Savage......14½
75 Sierra Nevada...46½@46¾
595 Scorpion......3.65@3¾
200 Silver Hill......1.60
650 Trojan......30c
40 Utah......20½
155 Union Con......72½@70
2075 Ward......3

AFTERNOON SESSION.

100 Adenda......35c
2900 Argenta......1½@1.15
1500 Big Prize......40@30c
300 Belmont......60c
400 Boston......1½
270 Booker......1@1.05
50 Bulwer......12
365 Bechtel......1½
140 Bodie......13⅝@14
540 Belle Isle......5¼@5½
300 Belvidere......80c
250 Champion......35@40c
1000 Caledonia (B H)......2½
160 C Pacific......8¼@8⅜
1050 Day......60@55c
200 Dudley......1½
50 Endowment......50c
105 Eureka Con......23
175 Grand Prize......2½@2.55
1450 Gila......25c
550 Goodshaw......35@40c
200 Hussey......15c
150 Hillside......1.85
75 Independence.....2@1.95
40 Jackson......3.90
400 Jupiter......1½
190 Modoc......1½@1.20
170 Mt Diablo......6
30 Manhattan......3
100 Metallic......65c
625 Martin White......2
50 McClinton......60c
30 Meadow Valley......5c
100 Mammoth......7½
50 Mono......6½
125 Northern Belle..3.95@3⅞
1000 N Belle Is......40c
1150 Navajo......40c
40 Noonday......3
100 N Noonday......2
620 Orient......25@20c
425 Paradise......1.70
1400 Queen Bee......30@35c
1100 Ray'd & Ely......1.10
350 Star......75c
100 Syndicate......5⅞
100 Silver King......5⅞
50 Summit......1½
300 S Bulwer......60c
250 S Standard......10c
250 S Bodie......20c
50 Tioga Con......3.05
450 Tuscarora......20@15c
20 Tiptop......1.10
400 University......35c
70 Wales......12

Saturday A. M., Sept. 27.

70 Alpha......17¾@17⅞
40 Alta......5⅞@5⅞
255 Andes......1.15@1.10
20 Argenta......1.60
200 Albion......20c
170 Best & Belcher..17⅞@17⅞
150 Belcher......4.30@4½
1215 Bullion......8½
10 Bulwer......11½
50 Benton......3.20
50 Belmont......50c
145 Black Hawk......80@75c
400 Booker......1.05@1
30 Bodie......14
1515 Belle Isle......5¼@5⅜
200 Big Prize......40c
650 Boston......1½
100 Bechtel......1.20
570 California......5⅞@5¼
535 Con Virginia......5⅞
90 Chollar......6⅝@6⅝
140 Crown Point......4½
205 Con Imperial......1.35
30 Confidence......10½
125 Caledonia......2.40
150 Challenge......2.30
1350 Con Dorado...1.90@1.95
150 C Pacific......8½@9
1300 Day......60@65c
300 Dudley......1.30
245 Exchequer......6¼@6
775 Eureka Con......23@26
480 Gould & Curry...11¼@11⅜
2030 Golden Gate......3⅞@4½
500 Gila......25c
200 Grand Prize......2½
65 Golden Terra......13
85 H & Norcross....13½@13⅝
195 Julia......4½
60 Justice......3⅞@3.70
400 Jupiter......1½
10 Kentuck......4.40
335 Lady Bryan......95c@1
2200 Lady Wash......1.05
225 Leviathan......55c
100 Leeds......65c
230 Mexican......36⅞@36½
890 Mackey......1.65@1.60
100 Mount View.....2⅞@2.60
100 Metallic......70c
20 Meadow Valley......5c
50 Mono......6⅝
10 Mt Diablo......6
30 Mammoth......7½
50 McClinton......65c
30 N Con Vir......8½
100 N Bonanza......1.65
450 N Belle Is......35@40c
120 N Noonday......2
445 Ophir......43⅞@43
60 Overman......9¼@9¼
205 Occidental......3¼@3.20
200 Oriental......15c
100 Orient......25c
630 Potosi......5⅞@5½
1150 Phil Sheridan......40c
250 Paradise......1.70
140 Raymond & Ely......1.10
315 Savage......13½
10 Seg Belcher......22
220 Sierra Nevada....45@46½
370 Silver Hill......1½@1.40
540 Scorpion......3.80@3.70
230 Star......70c
150 Summit......1⅞
100 Syndicate......5½
20 Trojan......20c
150 Tiptop......1¼@1.20
205 Union Con......71
30 Utah......19⅝@20
1165 Ward......3.20@3¼
145 Yellow Jacket...16⅝@16½

Monday A. M., Sept. 29.

140 Alta......5⅞@5½
400 Andes......1.05@1.10
25 Alpha......17¼
510 Belcher......4@3.90
320 Best & Belcher....18@17¾
1268 Bullion......8¼@8
380 Benton......3
115 California......5⅞@5¼
235 Con Virginia......5½
30 Chollar......7½@7¼
20 Confidence......10
335 Crown Point......4¼
1980 Con Imperial....1.30@1¼
140 Caledonia......2¼
10 Challenge......2¼
100 C P Ravine......20c
450 C Dorado......1.90
910 Exchequer......5⅞@5¼
450 Flowery......55@50c
470 Gould & Curry....11@10⅞
875 Golden Gate......4½@4
260 Hale & Nor......13½@13½
160 Julia......4.15@4.10
300 Justice......3½@3.60
270 Kentuck......4½@4.30
130 Lady Bryan......80@85c
1230 Lady Wash......1.05@1
200 Leviathan......50@45c
460 Mexican......36@35½
290 Mackey......1⅞@1.90
220 N Bonanza......1½@1.55
500 New York......50c
730 Ophir......40½@39½
80 Overman......9½
310 Occidental......3½@3
200 Potosi......5⅞@5⅝
295 Savage......13@13⅛
460 Sierra Nevada....45½@45
225 Silver Hill......1.40@1.35
640 Scorpion......3.60@3½
50 Solid Silver......30c
100 Trojan......25c
30 Utah......19½
415 Union Con......70@70½
825 Ward......3.10@3.05
100 Wells-Fargo......5c
100 Yellow Jacket......15⅞@16

AFTERNOON SESSION.

475 Argenta......95@90c
50 Albion......15c
200 Adenda......35@40c
470 Belle Isle......4.85@5
800 Big Prize......35c
207 Bodie......13⅝@14
335 Bechtel......1@1.05
140 Belvidere......80c
110 Bulwer......11½
400 Booker......1.05@1
400 Boston......1½
1600 Champion......35c
250 Concordia......20c
200 C Pacific......8½@8⅝
1530 Day......80@95c
150 Dudley......1½
100 Defiance......70c
235 Eureka Con......22⅞@23½
50 Endowment......50c
700 Gila......25@20c
100 Grand Prize......2.40
500 Goodshaw......25c
100 Giant & O A......6
200 Hussey......15c
235 Independence....2@1.85
60 Jupiter......1½
450 Leopard......55@60c
100 Manhattan......3
110 Metallic......70@65c
500 Mt Diablo......6
200 Modoc......1½
175 Mono......6⅝
230 Mammoth......7@6½
410 M White......2@1.90
140 Northern Belle......3⅞
1400 N Belle Is......40@35c
700 Navajo......30c
300 Noonday......3
100 Oriental......15c
100 Orient......20c
50 Paradise......1.70
280 Raymond & E..1.15@1.20
610 Star......65c
110 Summit......1½
50 Syndicate......5¼
200 S Bodie......25c
100 S Bulwer......55c
550 Tioga Con......3
100 Tuscarora......20c
120 Tiptop......1½
900 Wales......13@15

Tuesday A. M., Sept. 30.

150 Alpha......15@14½
150 Alta......5¼@5¾
620 Andes......95c@@1
565 Bullion......7⅞@7½
130 Belcher......3¾
120 Best & Belcher...17¼@17⅜
470 Benton......2⅞@2.85
385 California......5⅞@5½
1430 Con Imperial....1.20@1½
365 Crown Point......4
60 Confidence......9¼
525 Con Dorado......2
410 Con Virginia......5½
185 Chollar......6¼@6⅝
330 Caledonia......2.05@2
30 Challenge......2.20
750 Exchequer......5⅞@5
400 Flowery......50c
180 Golden Gate......4@4½
165 Gould & Curry......9⅞@9⅝
220 H & Norcross....12¼@11⅝
330 Julia......3½
360 Justice......3.20@3¼
15 Kentuck......4½
250 Leviathan......50c
450 Lady Wash......1
325 L Bryan......70c
1020 Mexican......32@31
190 Mackey......1.60@1½
500 N Bonanza......1½
150 North Con Vir......8
500 New York......50c
310 Occidental......2.10@2¼
990 Ophir......37½@36
30 Overman......8⅞
40 Potosi......5½
200 Plutus......2¼
125 Silver Hill......1.30@1½
230 Savage......12¼
240 Scorpion......3.10
305 Sierra Nevada....42¾@43
400 Trojan......25c
135 Utah......17¾@18
1160 Union Con......63@61
970 Ward......2.90@2.95
195 Yellow Jacket....15@15¼

AFTERNOON SESSION.

920 Argenta......95c@1
750 Addenda......40c
50 Aurora T......15c
270 Bulwer......11½@11¼
1150 Big Prize......35@40c
125 Bodie......13⅞@13⅝
250 Booker......95c@1
770 Boston......1½@1.45
160 Belle Isle......4.90
100 Belvidere......85c
50 Black Hawk......85c
400 Champion......30c
255 C Pacific......6¼@8
170 Day......1.05@1.10
50 Dudley......1½
550 Endowment......50@35c
160 Eureka Con......24@23⅞
410 Grand Prize......2¼@2.40
1050 Gila......25@20c
100 Hillside......1⅞
400 Hussey......15c
705 Independence....1⅞@1.80
390 Jupiter......1.10@1½
120 Leopard......55@60c
1175 Martin White....2@1.90
640 Mono......6¼@6
170 Manhattan......3
500 Metallic......65@70c
10 Northern Belle......3¾
50 Noonday......2.95
1150 N Noonday......2@1.60
100 Navajo......35c
950 N Belle Is......35@40c
100 Oriental......15c
450 Orient......15@10c
300 Paradise......1⅞
400 Queen Bee......30c
705 Raymond & Ely..1⅞@1.20
150 S Bulwer......55@50c
250 Summit......1.60@1⅞
100 Syndicate......5¼@5⅜
250 Star......50@60c
50 S Bodie......20c
60 Tioga......2.90
100 Tiptop......1.20
100 University......30c
900 Wales......20@19

Wed'sday A. M., Oct. 1.

140 Alpha......16¼@15⅞
65 Alta......5½
660 Andes......1@1.05
375 Benton......2.90@2.80
30 Best & Belcher......17¼
150 Belcher......3.65@3.60
505 Bullion......7⅞@7½
125 Confidence......9¼@9
515 Con Imperial......1½
260 Crown Point......4@4.05
745 California......5⅞@5¼
675 Con Virginia......5¼@5⅝
295 Chollar......6½@6⅝
500 Con Dorado......1.90
290 Caledonia......2.20@2¼
180 Challenge......2.10
340 Exchequer......5¼@5¼
275 Flowery......65@60c
160 Gould & Curry......9⅞@10
1800 Golden Gate......4@3
220 Hale & Nor......12
550 Justice......3.20@3¼
160 Julia......3.95@3.90
70 Kentuck......4½@4.20
280 Lady Bryan......75c
570 Lady Wash......90c@1
100 Leviathan......55c
220 Mackey......1.30@1.20
100 Mountain View....2½@2.40
650 Mexican......32½@32¼
470 N Bonanza......1½@1.55
220 New York......50@45c
805 Ophir......36½@36
20 Occidental......2.60
50 Overman......8⅞@9½
185 Plutus......2½
240 Potosi......5½@5⅝
580 Sierra Nevada...44½@45¼
50 Silver Hill......1.35
345 Scorpion......3½@3.30
265 Savage......12¼@12
100 Trojan......25c
165 Utah......17½@18
495 Union Con......62½@62⅞
220 Ward......2.90@2.95
310 Yellow Jacket....15@15¼

AFTERNOON SESSION.

300 Albion......20c
1650 Argenta......90c@1
380 Belmont......65@60c
330 Boston......1½@1.55
1095 Belle Isle......5⅜@5¼
1200 Big Prize......35c
90 Bodie......13⅞@13¼
90 Bechtel......1.05
155 Bulwer......11½
150 Black Hawk......80c@1
300 Booker......90c@1
300 Belvidere......85c
650 Champion......30c
225 C Pacific......7⅞@7⅞
500 Crœsus......20c
220 Dudley......1½
1740 Day......1½
200 Endowment......55c
10 Eureka Con......24½
105 Grand Prize......2.20@2
600 Golden Terra......12
925 Gila......15@25c
100 Goodshaw......35c
250 Independence......1⅞
200 Jupiter......1
100 Leopard......55c
50 Meadow Valley......5c
305 Mono......6
30 McClinton......60c
200 Mt Diablo......6
1475 N Belle Is......35@40c
20 Northern Belle......3⅞
500 N Noonday......2
70 Noonday......2⅞
330 Orient......15@10c
900 Oriental......15c
300 Paradise......1⅞@1.70
1700 Queen Bee......30@25c
2590 Raymond & E......1½
50 Rustler......30c
100 Star......50c
470 Silver King......5⅞@6
1200 S Bulwer......55@40c
100 South Standard......5c
400 S Bodie......20c
100 Summit......1.70@1½
160 Syndicate......5
205 Tioga Con......2⅞@3
300 Tiptop......1.20
100 Tuscarora......20c
300 University......10c
300 Wales......17@15

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Argonaut M & M Co	California	1	05	Aug 11	Sept 15	Oct 6	J L Fields	240 Montgomery st
Benton Con M Co	Nevada	2	50	Sept 17	Oct 22	Nov 10	W H Watson	302 Montgomery st
Best & Belcher M Co	Nevada	15	1 00	Aug 29	Oct 2	Oct 22	Wm Willis	309 Montgomery st
Bullion M Co	Nevada	11	50	Aug 12	Sept 16	Oct 7	J M Brazell	418 California st
Caledonia S M Co	Nevada	28	50	Aug 21	Sept 26	Oct 17	R Wegener	414 California st
Chollar M Co	Nevada	1	50	Aug 29	Oct 3	Oct 24	W E Dean	203 Bush st
Crown Point G & S M Co	Nevada	38	1 00	Aug 27	Oct 1	Oct 22	James Newlands	203 Bush st
Concordia M Co	California	2	15	Aug 20	Sept 26	Oct 21	A W Fox	310Pine st
Dudley M Co	California	5	50	Aug 14	Sept 17	Oct 13	E C Masten	22 Nevada Block
Gila S M Co	Nevada	5	25	Sept 30	Nov 3	Nov 24	W W Parrish	328 Montgomery st
Grand Prize M Co	Nevada	2	50	Sept 17	Oct 21	Nov 11	J E Dixou	20 S F Stock Ex
Hale & Norcross S M Co	Nevada	62	1 00	Sept 9	Oct 14	Nov 4	J F Lightner	58 Nevada Block
Hussey Con G & S M Co	Nevada	9	15	Aug 25	Sept 30	Oct 21	Jno E Dixon	20 S. F. Stock Ex.
Jupiter M Co	California	5	30	Sept 18	Oct 21	Nov 10	E C Masten	22 Nevada Block
Leopard M Co	Nevada	12	50	Aug 23	Sept 26	Oct 17	Jno E Dixon	20 S F Stock Ex.
Mexican G & S M Co	Nevada	8	1 50	Sept 11	Oct 15	Nov 6	C L McCoy	203 Bush st
Mono G M Co	California	5	1 00	Sept 4	Oct 9	Oct 29	W H Lent	309 Montgomery st
North Bonanza M Co	Nevada	3	25	Aug 13	Sept 17	Oct 7	W W Stetson	309 Montgomery st
Occidental Con G M Co	California	2	03	Aug 11	Sept 29	Oct 20	W T Smith	402 Montgomery st
Potosi M Co	Nevada	1	50	Aug 29	Oct 7	Oct 28	W E Dean	203 Bush st
Real Del Monte M Co	Nevada	8	1 00	Sept 18	Oct 20	Nov 29	C V Hubbard	203 Bush st
Savage M Co	Nevada	39	1 00	Sept 22	Oct 31	Nov 20	E B Holmes	309 Montgomery st
Sierra Nevada S.M Co	Nevada	59	2 00	Aug 30	Oct 3	Oct 22	W W Stetson	309 Montgomery st
South Standard M Co	California	5	15	Sept 11	Oct 15	Nov 3	C A Sankey	331 Montgomery st
Succor M & M Co	Nevada	24	25	Aug 30	Oct 3	Oct 23	Wm H Watson	302 Montgomery st
Tioga Con M Co	California	7	30	Sept 10	Oct 15	Nov 4	W H Lent	62 Nevada Block
University G M Co	California	3	20	Aug 21	Sept 24	Oct 15	W L Oliver	328 Montgomery st
Yellow Jacket S M Co	Nevada	33	1 00	Aug 4	Sept 8	Oct 8	Mercer Otey	Gold Hill, Nevada

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Butte Creek Hyd M Co	California	3	15	Sept 18	Oct 20	Nov 5	R L Taylor	310 Pine st
Butte Hydraulic M Co	California	—	10 00	Aug 25	Sept 29	Oct 21	L L Dennery	328 Montgomery st
Crœsus G & S M Co	California	2	10	Aug 22	Sept 23	Oct 11	E Huestis	328 Montgomery st
Dardanelles M Co	Nevada	7	50	Sept 9	Oct 10	Oct 27	H C Hinman	411 California st
De Haro M Co	Nevada	2	10	Sept 24	Oct 27	Nov 12	W W Bausman	409 California st
Double Standard G M Co	California	1	10	Sept 13	Oct 21	Nov 11	W H Lent	309 Montgomery st
Diana G & S M Co	Nevada	4	10	Sept 24	Oct 28	Nov 15	J T McGeoghan	318 Pine st
Dudley M Co	California	5	50	Aug 14	Sept 17	Oct 13	E. C. Masten	309 Montgomery st
Equitable Tunnel & M Co	Utah	21	10	Sept 16	Oct 21	Nov 14	C J Collins	227 Montgomery st
Geo Douglas M Co	Nevada	3	10	Sept 24	Oct 27	Nov 13	W W Bausman	409 California st
Hamburg M Co	Nevada	1	1 00	Sept 19	Oct 21	Nov 10	D A Jenning	401 California st
Harrington M Co	California	1	20	Aug 11	Sept 18	Oct 8	W W Bausman	426 California st
Joe Scates Con S M Co	Nevada	4	10	Sept 24	Oct 27	Nov 13	W W Bausman	409 California st
J & K G M Co	California	1	15	Sept 29	Nov 3	Nov 24	W H Lent	309 Montgomery st
Keystone S M Co	California	2	25	July 28	Sep 16	Oct 6	F E Luty	330 Pine st
Maybelle Con M Co	California	3	10	Sept 8	Oct 15	Nov 10	A W Fox	310 Pine st
Meadow Valley M Co	Nevada	15	25	Sept 12	Oct 22	Nov 17	T W Colburn	414 California st
Mt Hood M Co	Nevada	3	10	Sept 24	Oct 27	Nov 13	W W Bausman	409 California st
North Scorpion M Co	Nevada	1	10	Aug 11	Oct 15	Nov 6	T B Ludlum	211 Sansome st
Occidental M Co	Nevada	5	60	Aug 11	Sept 15	Oct 6	A K Purbrow	309 Montgomery st
Quartz Mountain G M Co	California	7	60	Sept 20	Oct 27	Nov 17	E Hestres	729 Montgomery st
Red Hill H M & W Co	California	2	03	Sept 1	Oct 2	Oct 18	A B Paul	228 Montgomery st
Sabine M Co	Nevada	2	10	Sept 24	Oct 27	Nov 12	W W Bausman	409 California st
Santa Mina G M Co	California	1	15	Aug 29	Oct 2	Oct 22	J H Sayre	330 Pine st
Sherwood Con M Co	Nevada	2	10	Sept 1	Oct 6	Oct 23	H S Stono	309 California st
South Utah M Co	Nevada	3	10	Sept 5	Oct 6	Oct 25	O S Healy	45 Merchants Ex
South Comstock G & S M Co	Nevada	6	25	Sept 9	Oct 13	Nov 3	J M Buffington	309 California st
Tolo M Co	Nevada	2	10	Sept 24	Oct 27	Nov 12	W W Bausman	409 California st
Vancouver M Co	Nevada	3	10	Sept 24	Oct 27	Nov 13	W W Bausman	409 California st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Belvidere M Co	Nevada	C V Hubbard	203 Bush st	Annual	Oct 21
Diana G & S M Co	Nevada	J T McGeoghan	318 Pine st	Annual	Oct 6
Gold Deposit M Co	California	J M Buffington	309 California st	Stockholders	Oct 7
Golden Gate Con Hy M Co	California	J T McGeoghan	318 Pine st	Annual	Oct 6
Indicator M Co	——	Jas Newlands	203 Bush st	Special	Oct 10
Kelsey G & S M Co	California	J H Sayre	330 Pine st	Annual	Oct 7
Lady Emma G M Co	——	F R Bunker	608 Montgomery st	Annual	Oct 8
Mammoth Grove M Co	California	A B Paul	328 Montgomery st	Stockholders	Oct 9
Mayflower Gravel M Co	——	J Morrizio	328 Montgomery st	Annual	Oct 6
N Scorpion M Co	Nevada	O E Gillett	211 Sansome st	Annual	Oct 6
Oroville Grav M Co	California	J T McGeoghehan	318 Pine st	Annual	Oct 16
Rough & Ready Con G & S M Co	Cal	W H Lent	309 Montgomery st	Annual	Oct 13
Silver West Con M Co	Nevada	F R Bunker	606 Montgomery st	Annual	Oct 14
Syndicate M Co	California	Jacob Stadfeldt Jr	419 California st	Annual	Oct 16
True Blue Con M Co	——	H R Miller	405 California st	Annual	Oct 20

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Belle Isle M Co	Nevada	John E Dixon	Stock Exchange	50	Aug 5
Bodie Con M Co	California	W H Lent	Nevada Block	1 00	Aug 1
California M Co	Nevada	C P Gordon	'23 Nevada Block	60	Aug 17
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	50	Aug 16
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	1 00	July 21
Independence M Co	Nevada	John E Dixon	Stock Exchange	26	Aug 21
Indian Queen M & M Co	——	A K Durbrow	69 Nevada Block	20	Aug 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	July 26
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	30	July 28
Montezuma M & M Co	——	J T McGeoghegan	318 Pine st	25	Aug 12
Pioneer M Co	California	J W Pew	310 Pine st	08	October 6
Standard Con M Co	California	Wm Willis	309 Montgomery st	50	Aug 12

SALES OF LAST WEEK AND THIS COMPARED

Thursd'y A.M., Sept. 25.

510 Andes......1.20@1.05
100 Alpha......17⅞
100 Alta......6@6⅛
220 B & Belcher......18@18¼
195 Belcher......4½@4.30
735 Bullion......8
110 Benton......3.55
15 Confidence......10⅞
10 Chollar......6⅛
260 California......5⅞
200 Con Imperial......1.35
360 Crown Point...3.35@3.45
150 Con Virginia......5¼@5⅞
200 Caledonia......2.40@2⅛
500 Con Dorado......2@1.90
310 Exchequer......6
50 Fairfax......90c
200 Gould & Curry...11⅞@11⅞
50 Golden Gate......3½@3.60
80 Hale & Nor......13⅞@13⅞
555 Julia......4.15@4.10
50 Justice......3.80
10 Kentuck......4½
250 Lady Bryan......1@95c
500 Lady Wash......1.10
750 Leviathan......55c
375 Mexican......37½@37
50 Mt View......2⅞
1210 Mackey......1.70@180
300 New York......55c
100 North Con Vir......8⅞@8⅞
160 N Bonanza......1.60@1.70
480 Ophir......43½@43⅞
10 Overman......9½
130 Potosi......5⅞
150 Sierra Nevada....47@46⅞
95 Savage......14@14⅛
130 St Louis......40c
365 Silver Hill......1½@1.60
300 Scorpion......3.65@3.70
75 Solid Silver......25c
380 Union......71½@70½
50 Woodville......40c
1300 Ward......3@3.10
265 Yellow Jacket......16¼

AFTERNOON SESSION.

250 Addcuda......35c
2470 Argenta......1.10
100 Albion......10c
2205 Belle Isle......5½@5⅞
300 Boston......1.40@1.55
30 Bulwer......11
50 Booker......1.10
160 Black Hawk......85c
30 Belvidere......85c
2000 Big Prize......45c
120 Bodie......13⅞
230 Bechtel......1.40
100 Concordia......20c
300 Caledonia (B H)......2½
450 C Pacific......9@8½
300 Crœsus......20c
2850 Day......60@50c
350 Dudley......1.40@1½
120 Eureka Con......22
300 Endowment......50c
195 Grand Prize.....2½@2.60
200 Gila......35@25c
150 Giant & O A......6
200 Goodshaw......30c
200 Hillside......1.90
200 Hussey......15c
350 Independence....1.95@2
6 Jackson......4
450 Jupiter......1½
60 Leopard......55c
690 M White......2.10@2
220 Mammoth......7½@7¼
200 Modoc......1½
225 Mt Diablo......5½@6
2100 N Belle Is......40c
10 Northern Belle......3⅞
1500 Navajo......40c
850 Noonday......3
500 N Noonday......1⅞@1.80
400 Orient......25@20c
100 Paradise......1.60
350 Queen Bee......30@35c
50 Rustler......50c
100 Raymond & E......1.10
50 S Bulwer......55c
180 Star......75@80c
200 S Bodie......30c
225 Summit......1.85@1.90
60 Tioga Con......3.05
1550 Tiptop......1
400 University......30@35c
300 Vortex......40c
30 Wales......11½

Thursday A. M., Oct. 2.

85 Alta......5¼
80 Alpha......17@16⅞
450 Andes......1.10@1.05
305 Benton......3@2.95
120 Best & Belcher...17⅞@18
160 Belcher......4
265 Bullion......8¼@8
140 Caledonia......2¼
150 Challenge......2.20@2.10
185 California......5⅞@5¼
745 Con Virginia......5⅞@5¼
1020 Con Imperial......1.30
280 Crown Point.....4½@4.30
50 Confidence......9⅝@9⅞
550 C Dorado......1.95
315 Exchequer......5¼@5⅞
75 Flowery......65@70c
155 Gould & Curry......10½
910 Golden Gate......3
210 Hale & Nor......12⅞
80 Justice......3.30
355 Julia......4.10@4.05
70 Kentuck......4½
830 Lady Wash......1
1020 L Bryan......85@90c
350 Leviathan......55@60c
695 Mexican......35@34⅞
200 Mackey......1.10
100 N Bonanza....1.55@1.60
350 New York......55@60c
110 North Con Vir......9
255 Occidental......3@2.90
770 Ophir......39@38½
100 Overman......9½@9⅞
610 Potosi......5⅝@6
290 Savage......12½
660 Sierra Nevada......48@49
50 Solid Silver......50c
230 Scorpion......3.30@3.35
130 Silver Hill......1.40
100 Trojan......20c
310 Utah......19@19⅞
790 Union Con......68@67½
370 Ward......3
150 Yellow Jacket...15½@15⅞

AFTERNOON SESSION.

1000 Albion......20c
300 Argenta......95@90c
50 Aurora T......10c
50 Belvidere......90c
20 Bulwer......11
1225 Belle Isle......5½@5
1300 Big Prize......35c
210 Bodie......12½@12⅞
890 Bechtel......1.05@1
500 Belmont......65@60c
125 Black Hawk......80@75c
210 Booker......80@90c
1000 B Chief......6 c
200 Boston......1½@1.55
800 Champion......30c
150 C Pacific......7⅞@7½
1550 Crœsus......20@25c
2430 Day......1½@1.40
375 Dudley......1.10
330 Eureka Con......24½@25
300 Endowment......50c
100 Goodshaw......30c
190 Golden Terra......13
80 Grand Prize......2.10
595 Hillside......1.60@1⅞
100 Hamburg......10c
100 Hussey......10c
370 Independence......1⅞
100 Meadow Valley......5c
700 Martin White...1.70@1⅞
530 Metallic......70c
300 Mt Diablo......6
125 Monn......5⅞@5½
680 Manhattan......3
220 McClinton......65c
195 Mammoth......6½
180 Noonday......2.99@2.95
200 N Belle Is......40c
70 Northern Belle......3⅞
100 Navajo......35c
110 Paradise......1⅞@1.70
800 S Bodie......20@25c
245 Star......50@65c
200 S Bulwer......40c
105 Syndicate......5
110 Summit......1½
390 Silver King......6¼@6
500 Tiptop......1.05
250 Tioga Con......2.60
500 Tuscarora......20c
750 University......25c
230 Wales......17@18

California Board—Latest Sales.

Wed'sday A. M., Oct. 1.

30 Alpha......15⅞
20 Alta......5⅞
100 Argenta......1
1350 Atlas......17@21c
500 Atlantic......5c
10 Belcher......3.80
30 Best & Belcher...17⅞@17¼
40 Bullion......7⅞@7½
40 California......6⅝
30 Con Virginia......5⅝
200 Con Imperial......1½
30 Caledonia......2.15
20 Challenge......2¼
20 Exchequer......5⅛
20 Gould & Curry......10
30 Hale & Nor......12⅞
30 Julia......3.90
40 Justice......3.20@3¼
175 Lady Wash......1
30 Mexican......32½@32¼
100 Mint......9c
20 Ophir......36½
20 Savage......12@12⅛
30 Sierra Nevada......44
200 Trojan......21c
20 Union Con......62½@62⅛
40 Yellow Jacket......15¼

AFTERNOON SESSION.

20 Alpha......16¼
30 Alta......5⅞
500 Atlanta......5c
450 Atlas......20@21c
100 Argenta......90c
70 Bullion......7⅞
100 Brilliant......5c
30 California......5⅞
20 Con Virginia......5⅞
100 Con Imperial......1¼
30 Exchequer......5¼
50 Enterprise......1
50 Gould & Curry...10¼@10¼
525 Gipsy Q......45@50c
20 Hale & Nor......12½
30 Julia......4.05
20 Mexican......33½
100 Newark......12c
500 North Carson......1c
20 Ophir......38@38½
20 Savage......12½
10 Sierra Nevada......46
10 Union Con......64½
20 Wales......19¼
100 Wells Fargo......8c
20 Yellow Jacket...15½@15⅞

Pacific Board—Latest Sales.

Wed'day A. M., Oct. 1.			
90 Alpha	16@16¼	60 Utah	17½@17¾
35 Alta	.5½	70 Union	.62½@63½
100 Bullion	.7½	225 Vanderbilt	.60@62c
10 Belcher	.3½	AFTERNOON SESSION.	
10 Benton	2.85	70 Andes	1.05
20 Best & Belcher	17½@17¾	15 Alta	.5½
270 Crown Point	4.05@3.95	500 Atlantic	.7c
770 Con Imperial	.1½	10 Bullion	.7½
50 California	.5½	10 Best & Belcher	17½
100 Chollar	.6½	10 California	.5½
50 Con Virginia	.5½	20 Exchequer	.5
110 Exchequer	.5½	60 Eureka Con	24½@24¾
30 Gould & Curry	.10	100 Gila	.15c
210 Hale & Nor	12½@12¾	30 Hale & Nor	12½@12¾
40 Julia	.4	30 Justice	.3.30
525 Justice	3.20@3.15	40 Mexican	.33½@34
20 Lady Wash	.1	100 N Standard	.2½
80 Mexican	.32@33	20 Ophir	.33½
50 New York	.50c	50 Occidental	.2
50 Overman	.8½	10 Sierra Nevada	.47
130 Ophir	.37@36½	120 Union Con	.65@67½c
150 S Nevada	.44@45	10 Utah	.18½
20 Savage	.12½	100 Uncle Sam	.2
		90 Yellow Jacket	.15½@15¾

The Mining Share Market.

The general condition of the share market for the week has been that of a dismantled ship, buffeted about helplessly upon the waves. There has been very little interest manifested in the stock business. Fluctuations were constant, but transactions very slight. News from the flooded mines was favorable, but fell upon a dull and listless market. Bodies were slack, and showed no sign of recuperation. A general demoralization has existed, which manipulators could not stay even by news of ore in the Union shaft. Comstocks declined, but towards the end of the week particular favorites, such as Ophir, and Eureka Con., gained perceptibly. Operators have been on hand for many days waiting for a turn in the tide towards improvement, but are still waiting. All stocks were in light demand, and up to the time of writing (Thursday, 3 P. M.) there are no indications of any kind of a "boom" in the market.

Gold-bearing Soapstone.

We learn from the Nevada City *Transcript* of the 30th ult., that the proprietors of the Stockbridge Soapstone and Asbestos Company, whose quarries are located on Bear river, 18 miles southeast of Nevada City, have for the past year been engaged in extracting soapstone, until they have accumulated thousands of tons of waste, that has been dumped down the mountain side. This waste was supposed to be utterly worthless until recently, when the attention of the workmen was called to an old arastra that had been standing in the locality for 20 years or more. Supposing that the played-out machine must have been fed on rock that was found thereabouts, they crushed several small quantities of the waste soapstone, a few days since, and found that it was rich in sulphurets. A number of tests of the stone have since been made, and it is found to pay from $10 to $40 per ton. The gold does not lie in pockets, but is to be found throughout the whole mass. It is the intention of the company to at once erect a mill on the grounds and commence taking out the gold. There will be no expense incurred in sinking shafts or running tunnels, as the material is taken out from the same quarry that the company have heretofore been taking soapstone for lining furnaces.

It is a little remarkable that material containing so large a percentage of sulphur should be appropriate for furnace lining. Soapstone, or steatite, is a common mineral, and constitutes extensive beds in some regions. It is often associated with serpentine and dolomite, and frequently contains crystals of dolomite, asbestos, tourmaline, magnetite, etc. It is the material of many pseudomorphs, the most common being pyroxene, hornblende, mica, etc. Steatite is a compact form of talc, and is an impure hydrated silicate of magnesia.

De Groot, Birge & Co., mining engineers and assayers, is the firm style adopted by Messrs. Henry De Groot, Sr., F. E. Birge and Henry De Groot, Jr., carrying on the above business in this city. The senior member of this firm is well and widely known throughout California, and the mining districts of the interior, being one of the most competent and reliable mining experts on the Pacific coast, where his experience in this capacity covers a period of more than 30 years. Mr. F. E. Birge is a wide awake young man favorably known in this city for the past 18 months, who came here with complimentary letters to some of our best people from their friends in the East. Being a young man of fine character, good habits and thorough business training, he will not fail to meet with appreciation and success. Henry De Groot, Jr., is the son of the senior member of the firm, and a careful and practical assayer and metallurgist, well known through his connection with various quartz and copper mining enterprises in California. With such a lengthened experience, and so large a share of working talents, this firm will be likely to receive, as they well deserve, a liberal patronage in their line of business.

The importations of gold and silver at the port of New York from Aug. 1st to Sept. 12th amounts to $20,290,187, of which quantity $19,650,763 was gold and 639,424 was silver. Of the total amount imported $10,030,846 arrived during the week ended Sept. 12th.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

Items.—*Ledger*, Sept. 27: The shaft of the Good Hope is now retimbered to the water line, some 35 or 40 ft from the surface. There are 500 tons of ore on the dump. The Empire company at Plymouth are sinking the south shaft 100 ft deeper to enable them to take rock from the 1200 level.

BUTTE.

Dogtown Gold.—*Mercury*, Sept. 26: Five men are employed in working the Baden mine. The owner, G. W. Cummings, showed $480 as the result of 72 hours' run on the claim. The force has been kept busy for several months back in placing the property in working order. This task was completed last week, and active operations in extracting the precious metal were promptly begun.

Armstrong Mine.—From M. N. Randall, superintendent of the Armstrong mine, located at Boston ranch, we ascertained Wednesday that the work of developing the property is progressing satisfactorily. Thus far the rock has prospected well. A second and lower tunnel is now being run, and the management expect to be taking out paying rock in large quantities within a few weeks' time.

DEL NORTE.

Mining News.—The Crescent City *Courier* says: The Big Flat Gravel mining company are pushing work in a favorable manner, and have the completion almost in sight. The Mountaineers are at work every day on their Jones' Creek ditch, which presents a substantial appearance. The French Hill Gold mining company are carrying on a large work in the construction of ditches to the mine, and also the necessary work for opening the claim in the most approved manner now known to hydraulic mining engineers.

FRESNO.

Rich Discoveries.—*Republican*: During the present summer many gold and silver-bearing ledges have been discovered in the eastern portion of Fresno county. Some of these veins are of immense size, and are exceedingly rich. One of them, situated in the same immense belt, is thought to be a continuation of the Comstock, and bids fair to equal that famous lode, both in extent and richness of its ore deposits. Our business men and supervisors seeing that an immense trade must flow from the mines to some convenient point on the railroad, have taken steps to build a road and secure the prize for Fresno.

INYO.

Monock.—*Independent*, Sept. 27: On the 19th instant crosscut in No. 2, in north drift 300 point, run through the ore vein in main drift at a width of over 4 ft. In a few ft the crosscut passed through the second vein as found in crosscut No. 1. At present writing face is in ledge-matter and ore. Ground at this point looks very favorable for yielding a large amount of ore. Started a crosscut east from drift north, 300 point, this morning, at a point in drift 200 from here in main tunnel. Have good ground for ore at this place. The under air-drain to 800 ledge is making good progress, and carrying fine ventilation with it.

Independence Tunnel.—A blind ledge, prospecting quite well, waecut a few days ago, and in a short distance further a promising ledge belonging to the Sardine company will be intersected at a depth of about 150 ft.

LASSEN.

Item.—The quartz claims on Gold Run, north side of Diamond mountain, are giving indications of great value. Some of them have already been bonded at a high figure.

MONO.

Mill Creek.—Bodie *News*, Sept. 27: Parties just in from this newly-opened camp report matters there as encouraging in the extreme. Daily new discoveries are being made of rich gold-bearing rock, and the prospectors are in high spirits over the outlook. We were shown some pieces of rock taken from the ledges found there, which show magnificently in native gold. Most of the rock is not the free character of ore, but much found is susceptible of easy manipulation, being clear from base or refractory matter. The approach to the mineral-bearing country from Little Lake is rugged in the extreme—only a trail being now in use, over which pack animals travel with difficulty.

Item.—Workings on the various claims on the east side of Bodie bluff average all the way from mere prospect holes to shafts 80 and 100 ft deep. The veins now being worked at a depth have all an easterly pitch.

Tioga.—Bodie *Chronicle*, Sept. 27: The shaft is down 625 ft, still in hard blasting rock. The Syndicate drift is in 457 ft and in good vein matter, the last 10 ft passing through several small stringers of very rich ore. The south lateral drift, on vein No. 3, has been advanced this week 17 ft. The ledge in face of drift is six ft wide, of good ore.

McClinton.—The west crosscut, 500 level, has been advanced 14 ft. The north drift has been advanced nine ft, the ledge being about 20 inches wide, with considerable improvement since last report. Drift on Bulwer ledge has been advanced 14 ft, the ledge showing a width of 18 inches. The east crosscut in new shaft has been run seven ft.

Noonday.—Fine developments are being made in crosscuts on 312 level. North drift is in 200 ft.

Bodie.—Machinery for the new air compressor is in position.

Champion.—Winze down 75 ft, with a six-foot ledge of good ore in the bottom. About two and a half ft of this ore is very rich, the balance being very good. In the winze struck a heavy flow of water, compelling a cessation of work in it.

Blackhawk.—The shaft is down 380 ft, the formation continuing of a coarse, black porphyry and quartz, showing a vein formation.

Queen Bee.—The west crosscut 250 level is in about 520 ft, is in stringers of good ore, which look favorable for a ledge near at hand. The upraise in north drift is up 15 ft in good milling ore.

South Belvidere.—The east crosscut on the 150 level has been advanced 10 ft during the week. A few days ago a ledge about 12 inches wide, of quartz and clay, was passed through. Some of the clay prospects well in gold. The crosscut will be continued for the purpose of cutting more ledges, which are known to exist in the ground of the company.

NEVADA.

Quaker Hill.—*Transcript*, Sept. 28: The cement claim at Quaker Hill, owned by Messrs. A. A. Sargent, Geo. Jacobs and others, has become an assured success after about two years of indefatigable prospecting. Last June the channel was reached and a systematic course of prospecting has since been going on. The channel has now been pushed through for a distance of 126 ft without the rim-rock opposite the shaft being reached. The bed of gravel is from 15 to 16 ft deep. The dirt is quite even all the way, paying from 25c to $1 per pan. The prospecting shaft is too far removed from the channel to admit of convenient working, and a new one is to be sunk immediately at a point 600 ft southwest of it. Hoisting works and a 10-stamp cement mill are to be erected at once. The mine now ranks among the most promising ones in the county.

The Nevada City Mine.—The main drift of Messrs. Shoecraft & Sprague's mine (formerly the Schmidt claim), at a depth of 150 ft, is being pushed ahead steadily. Considerable ground is being opened up preparatory to erecting a new mill. Not much ore will be regularly stoped out until the new mill is ready for it, but some extracted in running the drift paid over $40 a ton, which is more than double the yield anticipated.

Rich Wash.—Twenty-three ounces of washed nuggets were taken from a few ft of gravel in Grissel & Wing's claim, Washington, in this county, last week, and brought to the Citizens Bank here.

You Bet.—Grass Valley *Union*, Sept. 28: Hydraulic companies are taking advantage of the lack of water to put their claims in order for working the coming winter.

Yuba Quartz.—*Foothill Tidings*, Sept. 27: At the Yube Gold mine above Washington the manager, Mr. A. DeLand, has three shifts at work on a drift to cut the pay chute in the lower tunnel. The rock has been very hard since he began work, and only 12 ft had been run when Col. Rogers left there on Wednesday morning, at which time the rock drilled easier and it was thought better progress would be made. The wheel, flume and many things about the mill are sadly out of repair, and Col. Rogers has placed these in charge of Mr. Chas. Knowles, a practical mechanic.

Items.—Shultz & Co., who have been engaged in tunneling to strike the gravel lead supposed to exist near the Greenhorn canyon, beyond Banner mountain, have struck some very good indications and they think they will be able to reach the main channel in about 10 days. The river claims formerly owned by Jas. D. White, our county clerk, at Washington in this county, now owned and worked by Grissel & Wing, are turning out big of late. On Saturday 23 ounces of nugget gold were taken out from a small space in the bottom of the river channel. The pieces were quite large and smooth, being of the wash-class of gold. A patent has been granted to T. B. Crandall and others of North Bloomfield, for an extensive tract of mining ground known as the Blackbone claim and located above North Bloomfield. Major Downie has bonded a large tract of mining ground at Scott's Flat. It includes the New Caledonia, Rising Sun and several other claims. It is the intention to organize a company of capitalists to purchase the ground and work it.

Derbec.—The reported rich strike in the Derbec has been denied, but the *Foothill Tidings* of the 27th says: The extraordinary seam lately found in the Derbec is supposed to extend northeast through the Marley, Black, Fancy and Bishop mines, all of which are situated within a mile of the first named. Six years ago the Bishop produced $6,000 within a distance of 30 ft. The Black claim, $11,000 in 15 or 20 ft, the Fancy $1,400 in 7 or 8 ft. The seam is said to have yielded several hundred dollars to the pan, and that between $15,000 to $30,000 were extracted within the distance of a few ft. Some of the chunks of gold are reported to weigh an ounce each.

Ironclad.—*Transcript*: The Ironclad mine at Rough and Ready continues to look well. A 10-stamp mill is to be erected as soon as possible. Mr. Cannet has made arrangements to put in a Willard blow-pipe furnace to facilitate the milling and reduction or ores.

The Santa Anita Lodge.—The Santa Anita mining company, three miles above Washington, have been pushing their tunnel ahead steadily since the last report. At a distance in of 220 ft from the mouth a ledge eight ft thick and pitching east has been developed. It is thought this is the main ledge. The two others opened up some time since pitch to the west and are much smaller. Seven men are kept at work, and about 150 tons of ore that, Superintendent McGlew says, will pay from $12 to $15 per ton is already on the dump. It is the intention of the company to get the mill erected and in operation before the snow flies. Twenty tons of ore can be easily extracted each day from this claim, after it is once fairly in working order. John McCarty is running a tunnel on the extension of the Santa Anita, south side of Poorman's creek, where he is believed to have a ledge some five ft thick. The grade of the ore is about the same as that mentioned above.

A Paying Gravel Claim.—The bullion product of the Excelsior Water and Gravel mining company, at Smartsville, for August was $51,640. The capital stock has recently been increased to 100,000 shares, and two dividends on the new stock have already been paid, each aggregating $25,000. Another dividend of the same amount has been declared, payable on the 6th of October.

Item.—The Campbell brothers have recently struck a fine ledge in the reservoir at Chapman's ranch. The ore is said to be rich in sulphurets and gold.

Rich Quartz Strike.—Grass Valley *Union*, Sept. 30: A rich strike in quartz is said to have recently been made in a newly discovered ledge on Manzanita hill, about one-half mile east of Forest Springs school house. The parties who discovered it have been working on the ground about three months, and have put down a shaft 26 ft, or as far as they could go at present on account of the water. The rock, dirt and cab all prospect richly in free gold, the quartz being hard and white and not decomposed. The ledge, which is known as the "Lone Tree," is an entirely new discovery, and has never before been worked. It was found by two prospectors who have been in the district about six months. The find is said to be creating some excitement in that portion of the district.

PLACER.

Items.—*Herald*, Sept. 27: W. H. Puffer, of Penryn, has recently had some rock crushed at Pugh's mill, from the mine near Penryn, that panned out something over two ounces to the ton. Mr. Hooper, who has been working a ledge on Dutch ravine, recently made a crushing to the tune of over $90 per ton. It is reported on reliable authority that Heenan and Lawler have recently struck some very fine rock in their shaft out near Rock creek.

SAN BERNARDINO.

New York District.—The Pioche *Record* says that the New York district, in San Bernardino county, 5 miles from the Nevada line, has several good ledges of free milling ore which will average $50 per ton. Assays have been obtained as high as $500. A Mr. Macfarlaine is removing a quartz mill from Long Valley, Nev., to this district at Ivanpah. Two mills are already running. The ore at Ivanpah appears to lie in deposits or pockets, many of them yielding exceedingly rich ore. There are rarely any seams or mineral stains to indicate the whereabouts of these pockets and the miners go blindly at their work, trusting to luck. A pocket containing a couple of tons of ore was struck which yielded $8,000 per ton. Fifty dollars per ton is charged for milling ore. The ledge was a little narrow seam of quartz carrying free gold, but Mr. Macfarlaine says it did not amount to anything. Mining has been kept back considerably at Ivanpah during the past year by litigation.

SIERRA.

Items.—*Mountain Messenger*, Sept. 27: The Bonanza company, at Howland Flat, will be in working order by January. All the outside work will be completed in a month. Work on the inside is progressing. There is about 325 ft of tunnel to run, 800 ft of air-course to put in, and 175 ft of air-shaft to raise. The shaft is up now 175 ft, and the tunnel is in 3,500 ft. Last week the contractors broke through into the old breasts of the "Empire" and it is certain the Bonanza tunnel is but 5 ft above bedrock, with the bedrock raising ahead at the rate of at least two ft in a hundred. The Virginia company are working off in the old Empire, toward their own ground. They have fair prospects and it is hoped the same will continue.

SISKIYOU.

Scott Valley Mines.—Mr. H. C. Cory, of Etna Mills writes us from these mines and says: The Montezuma claim, opened by Denny & Parker, is working 12 men and realizing from five to 96 ounces of gold per day. They have ground to last them 20 years. The gravel deposit is quite extensive. Hundreds of acres of good ground yet untouched for want of capital to work them. It forms the selvage or border of Scott valley, in which all kinds of grain, fruit, vegetables, and butter and cheese are produced in abundance. Vein mining in this county will last for ages. In the French Creek lead the quartz vein can be traced for miles by its croppings. It is 5 ft thick, and prospects well, the lowest assay being $28 gold and $3 silver. The vein is located so convenient to the valley that many farmers have located claims and doing enough work on them to hold them until capital comes. There is a belt of country 60 miles wide running through the county in which veins of untold wealth are known to exist, the leading ones being the Black Bear, Klamath, Evening Star, Morning Star, Johnson, Lindsey, Turk, Abbot, Cornish, Empire, and many others, and lastly the Beaver Creek cinnabar mines, near the Oregon line.

SONOMA.

Great Eastern Quicksilver Mine.—Healdsburg *Enterprise*: An important improvement now being made at the mine is the addition of hoisting works, capable of working 600 or 700 ft levels; there will be an ore cage and a double stroke pump, the latter being needed to free the lower levels of water. A kiln of 60,000 brick has recently been burned at the mine, and the little Eames furnace is to be taken down; another one will be built upon its foundations, with Haskins & Hall's patent ore chamber attached. There is now in use at the mine a 26-ton Maxwell furnace, almost new, and in fine condition. The improvements in the way of buildings, roads, etc., are numerous and substantial. At present the hoisting works are being adjusted, and by next week it is expected that the mine will be in full operation. D. H. Haskins is the Superintendent.

TRINITY.

Rich Gravel.—*Journal*, Sept. 27: In putting in four 12-ft boxes in the Oregon Gulch Mountain claim last week, Superintendent Loveridge removed the gravel to the depth of four ft and ten ft in width. This was washed and yielded a little over $500. And this from gravel three ft from the bedrock. There is more gold in that mountain than there is in any other place in this State. A good supply of water is all that is needed to make it the best paying hydraulic mining property on the coast.

TUOLUMNE.

Bonanza.—The *Union Democrat* of Sept. 27th says: On Saturday last there was shipped through Wells, Fargo & Co.'s Express to San Francisco, the snug little sum of $189,000, which was extracted from a pocket in a quartz vein in the bowels of Gold hill, which lies adjacent to Piety hill, west of the Episcopal church. The fortunate owners are Divoll, Bray and Clark, three energetic, experienced and persistent pocket-hunters. In early days it is reported that a pocket of $60,000 was taken out of the same hill, and much prospecting has been done since, but nothing found until the present strike. The present owners of the bonanza have been working in their claim but a little over a year, and none of the quartz was crushed in a mill, but all in a hand mortor. It is estimated that in all they have taken out over a quarter of a million dollars. There are plenty more pockets around Sonora, and all it needs to discover them is some experience in this kind of mining and good staying qualities. Quartz mining interests are doing well, and placer mining is reviving in the old gulches where it was abandoned in the more palmy days of 1849 and the following years.

Item.—*Independent*, Sept. 27: The Starr King vein is looking finely. In the shaft, 155 ft deep, they have struck another 24-inch lode which shows free gold. Still sinking, in easy ground. There is only water enough to run the mill a few hours a day, until the rains come. The Starr King is located four miles east of Summerville.

YUBA.

Meadow Lake Mines.—*Appeal*: These old mines, which made many Marysvillians rich in their imagination several years ago, are not yet abandoned. It is said the ore reduced recently was some that had been exposed to the weather for a long time, and many claim it was less refractory than if just taken from the mine. The ore to be tested is now being extracted from the U. S. Grant mine. The result of the test will be known in a short time. From the last lot of ore 80% of the gold contained was extracted and saved.

NEVADA.

WASHOE DISTRICT.

Ophir.—Gold Hill *News*, Oct. 1: A very interesting formation has been encountered in the joint Mexican winze from the 2100 level, the bottom having taken a plunge into low-grade quartz, in which it still continues. The dip of this formation where encountered is to the west, and similar to that encountered in the incline where first struck, but which afterward took a regular eastern dip. The joint Mexican crosscut west on the 2000 level is again in a harder formation, the face 102 ft from the main lateral drift.

Sierra Nevada.—The east drift, 2200 level is making an average of three ft per day through soft vein porphyry; total length, 85 ft.

Union Shaft.—The bottom of the shaft dropped into ores last Saturday of good quality, and this morning was still in ore giving good assays. This ore was struck 40 or 50 ft above where it was expected. The diamond drill has already proved its existence on the level below.

Con. Virginia.—The water flowing from the face of the joint crosscut west on the 850 level has been piped down to the Sutro tunnel level. The flow has decreased to about eight inches. The south lateral branch is making three ft per day and is encountering more quartz; total length, 120 ft. The raise from the 1650 level is still in porphyry and quartz through which it is making steady progress.

California.—The streak of ore encountered upon the 2150 level is being raised upon near where the drift on that level connecting with the Ophir crosses it. It is also being followed north and both workings are in good milling ore of the usual width.

Exchequer.—A crosscut has been started west 100 ft from the Alpha winze, on the 2400 level, and different crosscuts will be run at various points in the mine to prospect the ground thoroughly from the footwall to the hanging wall of the vein.

Con. Imperial.—Preparations have been completed for continuing the south winze on down to the 2800 level. The joint Alpha crosscut west, 2000 level, is making good progress and cutting quartz in stringers.

Mexican.—The joint Union crosscut on the 2000 level is in 147 ft in soft ground, requiring to be closely timbered, and through which only 2 ft per day can be made. The joint Union winze from this level is down 106 ft, and continues in soft, wet, vein material. Average sinking per day, about 2 ft.

New York.—The incline is being pushed rapidly on down, and is encountering stringers of quartz giving low assays.

Leviathan.—The face of the north lateral drift on the 750 level was yesterday nearly all in low grade ore assaying from $5 to $10 per ton. This is considered, however, to be merely a bulge or output from the main ore vein, in the west wall of which this drift is being run. The south lateral drift on the same level, also following the west wall, is simply in a very hard, black dyke formation at present, with occasional streaks of quartz.

Golden Standard.—The vein formation now being encountered in the Golden Standard tunnel is becoming more moist and treacherous as advancement is made.

Silver Hill.—The face of the crosscut east on the 1300 level is in a mixture of clay, porphyry and quartz, the latter carrying low grade ore; total length of crosscut, 450 ft.

SAN JACINTO DISTRICT.

Item.—*Silver State*: Parties owning several mining claims in this district on the west side of the Humboldt river, opposite Rye Patch, have put up a 4-stamp mill to run by water power. Valuable ledges have been uncovered.

UNIONVILLE DISTRICT.

Old Mine.—*Silver State*: Major Lathlean, of Unionville, informs us that he is now at work on the old Leroy mine, one of the first claims located in that camp. He is drifting on the lead, and has a four-ft vein of ore which assays from $50 to $150 per ton in silver. This ledge, which crops out boldly on the side of a high mountain, was abandoned by its original owners, who expended considerable money in running a tunnel to intersect it. The tunnel was designed to cut it at a great depth from the surface, but long before it reached the ledge the funds of its projectors were expended, and they abandoned the claim, which they never prospected, in disgust, although there was a fine looking ledge bearing considerable ore in sight.

PIOCHE DISTRICT.

Day Mine.—*Record*: The ore is opening out well and

[Continued on Page 220.]

Origin of Mineral Veins.

By J. Arthur Phillips, F. C. S., Etc.

The origin of mineral veins is a subject which has long occupied the attention of writers on natural history; and numerous theories have at different times been framed with the object of explaining the nature of the causes by which they are supposed to have been produced.

An enumeration and classification of those which had been brought forward previously to 1838 is given by Baron von Herder in his work on the Meissen adit, published in that year.

This may be briefly summarized as follows:

1st. *Theory of contemporaneous formation.*—According to this, lodes are not mineral matter occupying previously existing fissures, but were formed either contemporaneously with the enclosing rock, or were subsequently produced by metamorphic action.

2d. *Theory of lateral secretion.*—Lodes are fissures filled by various mineral substances derived from the rocks enclosing them.

3d. *Theory of descension.*—By which veins are explained as being produced by the filling of fissures by materials introduced from above.

4th. *Theory of ascension.*—This teaches that veins are the result of deposits of mineral substances which have been introduced into fissures from below.

Four distinct modifications of the last theory may be divided into as many sub-classes.

a. Infiltration.—The material was introduced by aqueous solution.

b. Aqueous vapors.—The fissures were filled with mineral matter introduced by the agency of steam.

c. Sublimation.—The substances constituting mineral veins were introduced in a gaseous condition by sublimation.

d. Injection.—The materials forming veins, have, according to this view of the question, been introduced in a state of igneous fusion.

The formation of veins has been the subject of much speculation since the date above referred to; and various authors have either advanced new theories, or have advocated more or less important modifications of those before promulgated.

Among the most worthy of consideration may be cited the researches of Mr. R. W. Fox, who, after ascertaining the existence of electric currents in many of the metalliferous veins of Cornwall, suggested the probability of this force having acted on the various metallic sulphides and chlorides, dissolved in the hot water traversing fissures, in such a way as to determine the peculiar mode of their distribution. He has also endeavored to account for the prevalence of an east and west direction in the principal Cornish lodes by their position at right angles to the earth's magnetism.

Weighty objections to this theory, however, have been pointed out by W. J. Henwood, as well as by other experienced miners; and observed facts would indicate that the general direction of veins, in different mining districts, varies so entirely, that it probably depends rather on lines of fracture than on the action of voltaic currents. In fact, Von Beust, in his criticism on Werner's theory (1840), appears to have conclusively demonstrated that the majority of lode fissures have been produced by volcanic or plutonic agency.

It is well known that mineral veins are usually found in regions in which igneous rocks are abundant, and in situations where they have burst through crystalline or other stratified deposits. Lodes also more frequently occur in rock formations of great age than in recent ones; and certain classes of them (as, for instance, those of oxide of tin) are only found in the oldest rocks.

Sir Charles Lyell, when speaking of chemical deposits in mineral veins, remarks: "We know that the rents in which ores abound extend downwards to vast depths, where the temperature of the interior of the earth is more elevated. We also know that mineral veins are most metalliferous near the contact of plutonic and stratified formations, especially where the former send veins into the latter—a circumstance which indicates an original proximity of veins, at their inferior extremity, to igneous and heated rocks. It is moreover acknowledged that even those mineral and thermal springs, which, in the present state of the globe, are far from volcanoes, are nevertheless observed to burst out along great lines of upheaval and dislocation of rocks."

It is generally admitted by geologists that igneous causes have been in active operation in all past ages of the world. They have been constantly changing their areas of activity on the earth's surface; and those districts which are now great centers of volcanic action were, at remote geological epochs, in a state of perfect tranquillity; on the other hand, districts in which violent eruptions took place at former periods have often been entirely free from volcanic eruptions during later geological times. It would appear that the last expiring efforts of volcanic action frequently manifest themselves in the form of geysers or boiling springs, which, in addition to pouring forth steam and water holding various salts and minerals in solution, give off carbonic acid, sulphureted hydrogen, and other gases.

Hot and boiling springs are exceedingly numerous in some of the mining regions of the Pacific States of North America, and present phenomena possessing the highest degree of interest to the geologist.

The Steamboat Springs, seven miles northwest of Virginia City in the State of Nevada, are probably the most remarkable of those yet discovered. They are situated at a hight of 5,000 feet above the level of the sea, near the foot of the eastern declivity of the Sierra. In this locality the granite is traversed by numerous parallel fissures, which either give out highly heated water or simply eject steam. The principal group of crevices, of which the direction is nearly north and south, comprises five longitudinal openings, extending nearly in a straight line for a distance of more than 1,160 yards. These are often full of boiling water, which sometimes overflows and escapes in the form of a considerable rivulet, whilst at others it does not reach the surface, although violent ebullition is heard to be taking place below. These waters are slightly alkaline, and contain sodium carbonate, sodium sulphate, and common salt. There is along the whole line an escape of carbonic acid, sulphureted hydrogen being also evolved from certain points in notable quantities.

Silica, sulphur and oxide of iron are deposited; and the fissures are lined on either side (sometimes to the thickness of several feet) by incrustations of more or less hydrated silica. This is constantly accumulating on the sides, whilst a longitudinal central crevice affords a passage for the escape of steam and boiling water. This silica forms a series of semi-crystalline bands parallel with the walls of the fissure, and often presents the comby appearance peculiar to the beds of deposition so frequently observed in mineral veins.

At some distance to the west of the line of fissures now in a state of activity, is another group of longitudinal siliceous deposits, also presenting a central crevice, from which steam and carbonic acid still escape, although no longer traversed by hot water. The silica from this locality contains oxides of iron and manganese, together with traces of copper, and minute crystals of iron pyrites. It has also been stated to be sometimes slightly auriferous; but I was unable to detect this metal in any of the specimens selected for examination.

The granite in which the fissures occur is covered, both on the eastern and western sides of the valley, by a compact basalt.

On analysis the deposited silica was found to contain from 4.72% to 6% of water; and on being boiled, in a finely divided state, with a strong solution of caustic potassa, 6.68% of its weight was dissolved.

Thin sections of this substance examined under the microscope show the reniform structure of chalcedony, with patches of amorphous silica, stains of oxide of iron, and geodes of crystalline quartz. Some few specimens also contain minute crystals of pyrites. The crystals of quartz lining cavities filled with amorphous silica become very distinct when examined by polarized light; but the chalcedonious markings then almost entirely disappear.

At the "Sulphur Bank" on the shores of Clear lake, California, is a solfatara some six or seven acres in extent, where a much decomposed volcanic rock is traversed by innumerable fissures, from which steam, together with carbonic and boracic acids, is continually issuing. Sulphur is deposited on the sides of the crevices; and gelatinous silica is found coating chalcedony and opalescent silica in various stages of formation, from the gelatinous state to that of the hardest opal. This indurated silica is sometimes nearly colorless, but is more frequently permeated by cinnabar and iron pyrites, or blackened by a tarry hydrocarbon. Cinnabar is also found in striæ, and occasionally in veins, as well as in concretionary masses of considerable size.

Sections of chalcedony and semi-opal from this place, when examined under the microscope, are often found to enclose crystals of pyrites, together with crystalline cinnabar, although the latter mineral has generally been deposited in an amorphous state. A specimen of chalcedony taken from one of the fissures in the sulphur bank, which on being first broken was exteriorly so soft as readily to receive an impression of the nail, had on reaching this country become hardened, and had assumed the ordinary characteristics of that mineral. Thin sections of this specimen show a structure resembling fine-grained fortification agate, and are traversed by numerous fissures filled by opaque oxide of iron.

The vein matter of lodes on the Pacific coast of North America has generally so many characteristics in common with deposits produced by solfatara action, that various geologists, who have examined that region, have arrived at the conclusion that the two are the result of similar causes.

Von Richthofen remarks that "the process which immediately follows the opening of fissures at or near active volcanoes, is the violent emission of steam. A crevice in this state is called a *solfatara.* It has been proved by Bunsen for the volcanoes of Iceland, by Bouseingault for those of the South American Andes, by St. Claire-Deville for those of the Canary Islands, and by myself for the tertiary volcanoes of Hungary and Transylvania, that every solfatara, in the course of time, passes through two stages, in the first of which the steam is accompanied by gaseous combinations of fluorine and chlorine, in the second by those of sulphur, while a third one is ordinarily marked by the emission of carbonic acid and combinations of hydrogen and carbon; at which time the term solfatara is no longer applicable. We have in the elements evolved during the first two periods, all the conditions required for filling the Cometock fissure with such substances as those of which the vein is composed."

W. P. Blake describes the lodes at Bodie Bluff, nine miles west of the town of Aurora, as being of a character favorable for the production of gold, and then goes on to say: "They are all alike in this respect, and doubtless had the same origin. The quartz, instead of being a solid homogeneous mass, is formed in thin layers or coats, one over the other, like sheets of paper or pasteboard, with irregular thin seams or openings between. This structure, with other peculiarities, indicates that the veins were deposited gradually in the fissures by thermal springs, similar perhaps to those now existing at various points along the eastern base of the Sierra Nevada, as, for example, at Steamboat Springs, Washoe."

Daubree observes that veins can have been but very rarely filled either by fusion or sublimation, but that, on the contrary, the materials of which they are composed have been deposited from solution in highly heated waters.

The late M. de Senarmont has shown that the principal minerals found in veins may be produced in a crystalline form by the aid of water heated to temperatures varying from 130° to 300° Centigrade. Among the minerals which were thus obtained may be enumerated quartz, epathose iron, the carbonates of manganese and zinc, sulphate of baryta, sulphide of antimony, mispickel, red silver ore, etc.

In the present state of our knowledge we are unable to explain all the various phenomena which have been observed in connection with the origin, composition, structure and mineral constitution of veins; but a careful consideration of ascertained facts would appear to lead to certain general conclusions, forming a sort of skeleton map, of which the details remain to be filled in by the aid of further research.

First. Metalliferous lodes are more numerous and productive in the vicinity of igneous rocks than elsewhere.

Secondly. There is abundant evidence of volcanic eruptions having taken place during all periods of geological time.

Thirdly. Solfatara action and thermal springs are often the latest active evidences of volcanic disturbance.

Lastly. Crystalline quartz, iron pyrites, sulphide of mercury, and various other minerals are at the present time being deposited by solfatara action, in veins possessing many of the characteristics of ordinary lodes.

Is it then unreasonable to suppose that many mineral veins may have originally been fissures produced by volcanic disturbances, which have subsequently become filled during the ensuing periods of solfataras and hot springs? This view of the subject would appear to indicate the nature of the connection existing between such veins and eruptive rocks, and also to explain why they should generally be of more frequent occurrence in the older rocks than in formations of comparatively recent date.

Carefully conducted analyses, executed on large quantities of the waters issuing from active solfataras and thermal springs, might probably afford valuable information on this subject; but it must not be forgotten, as observed by M. E. de Beaumont, that we cannot expect the contents of hot springs and mineral veins to be identical. The more insoluble of the bodies in solution, both simple and compound, will be deposited in proportion as the temperature and pressure decrease; the more soluble only being discharged in the waters issuing from the surface.

The occurrence in lodes of minerals exhibiting pseudomorphic forms, apparently produced by their deposition in molds left by the removal of crystals of other substances, and the presence in drusy cavities, of stalactites of calcite, quartz, pyrites, etc., indicate that a partial decomposition and re-arrangement of some of their constituents has been effected by the action of water at comparatively low temperatures. There can also be little doubt that fissures and cavities have sometimes been filled by infiltration from the enclosing rocks, as well as by the percolation of meteoric waters from the surface. The operation of these agencies is perhaps, in most instances, extremely slow, although, according to R. B. Smyth, even gold, under certain conditions, may be deposited in appreciable quantities within comparatively short periods. This author states that, in the gold-fields of Victoria, pieces of highly mineralized fossil wood, taken from the deeper workings, as well as timber used for supporting galleries, which had remained in the mine for some years, have exhibited, under the microscope, particles of gold adhering to and intermixed with crystals of iron pyrites, all through the central parts of the wood. This is confirmed by Mr. Ulrich, who says that in the gold drifts pyrites is often found incrusting or replacing roots and driftwood, and that samples, assayed by Messrs. Daintree, Latta & Newberry, have yielded amounts of gold varying from a few pennyweights to several ounces per ton. According to Mr. H. A. Thompson, a specimen of pyrites from the center of an old tree trunk gave by assay above 30 ounces of gold per ton.

On examining pyrites forming the substance of fossilized trees found in the deep diggings at French Corral, Cal., I was unable to detect any decided traces of gold; but assays of several specimens of the cementing pyrites of an auriferous deposit of tertiary age, and probably belonging to the later pliocene period, invariably afforded a small amount of that metal. A microscopical examination of the gold in this pyrites showed that the fragments were frequently angular, and apparently unwaterworn.

In order to ascertain whether waters traversing mineral veins contain an appreciable quantity of any of the constituents of the lodes through which they pass, I subjected three specimens, obtained from deep Cornish mines, to careful analysis. I am indebted for the samples operated on to Mr. Francis Oats, of Botallack, a member of the Miners' Association of Cornwall, who in each case collected about six gallons of the water issuing from the bottom of a level, where the lode beneath remained intact, in clean and carefully stoppered glass bottles.

The amount of soluble matter in the specimens examined is small, and the constituents do not differ materially from those which might be expected to occur in ordinary well-water from the same district. The third sample evidently consists of a mixture of sea-water with water derived from other sources.

The solid contents, however, are considerably less than in sea-water, and consequently, in order to institute an approximate comparison between them, we will suppose sea-water to have been diluted with distilled water until the total amount of fixed constituents has been reduced to that contained in the water from Botallack.

Copper, zinc, lead, tin, etc., were carefully sought for by the usual tests without success; but the spectroscope was only employed for examining the alkaline chlorides with the flame of an ordinary Bunsen gas-burner. It is, however, probable that traces of various substances, present in such minute quantities as to escape detection by ordinary means, might be found by spectroscopic observation with the assistance of a powerful induction coil; and I therefore propose to make further investigations by the aid of this instrument, and also to operate on very large quantities of the various waters subjected to analysis.

A difficulty in all investigations of this class must necessarily arise from the impossibility of determining the distance which the waters, in each case, have passed through the several lodes. It is consequently quite possible that samples of water may have been examined which, after passing for long distances through the enclosing rocks, may have ultimately entered the veins a few feet only from the point at which they were collected.

Should, however, one specimen of water be found to contain appreciable amounts of the constituents of the vein from which it issued, whilst another is comparatively, or entirely, free from them, it might be inferred, all other conditions being the same, that the first had traversed a greater extent of vein-matter than the second.

It is evident that much time must be expended and numerous analyses made before reliable conclusions can be arrived at; and should waters containing appreciable quantities of the constituents of the veins from which they have issued be discovered, an important question will still remain unanswered,—Is the water ascending through a metalliferous vein ever the medium from which fresh deposits of mineral matter are being produced at the present time? or does it, on the contrary, take up and carry away some of the constituents of the lode, giving rise to new combinations and a re-arrangement of its elements? That both these actions may sometimes be going on simultaneously does not appear improbable.

An Aged and Historic Ship.—The ship that carried William III. (Prince of Orange) to England, when he went to take possession of the Monarchy, had a long life. It was named the Princess Mary, and was built on the Thames. It was more than half a century old when William landed from her at Torbay, November 4th, 1688. She was 80 feet 3 inches long, 23 feet broad, double decked, with two masts, square rigged. Her earlier name is said to have been Brill, but this we believe is not established. She was christened the Princess Mary after the King's consort, when she was selected to bear the fortunes of the monarch to his new kingdom. During the whole of his reign and that of his successor, Queen Anne, she was used as a pleasure yacht and was kept in thorough order, some of the repairs being quite extensive. In 1714, when the vessel came into possession of George I., she ceased by his order to form part of the royal establishment. About 1750, in a fit of economy, the government sold her to the Messrs. Walters, of London, who christened her Betsy Cains after a favorite West India belle of that name. After a score or more years in the West India trade, during which she was known as a staunch vessel and a fast sailer, she was sold to Messrs. Carline, of London, who employed her as a collier to take coals from Newcastle to the great metropolis. About the year 1825, more than two centuries probably from the date she was launched, she was purchased by Mr. George Finch Wilson, of South Shields. On the 17th of February, 1827, she was taking a cargo of coals from Shields to Hamburg and struck upon the Black Midderne, a dangerous reef of rocks north of the mouth of the Tyne, where a few days afterward she became a total wreck. Her remains were eagerly purchased, and innumerable snuff-boxes and other souvenirs were made from the old oak that had been so indestructible through more than 200 years.

Alkaline Metals.—Schiel has observed that the alkaline metals do not retain their brightness if kept in a stoppered bottle under rock-oil, and he ascribes the fact to the formation of ozone.

The Somorrostro (Spanish) Ore Mines.

The center of the Somorrostro iron district is situated about 7½ miles west-northwest of Bilbao, and at an equal distance from the shipping stages on the river Nervion, between Bilbao and the sea; but the known deposits are scattered over a large area, some being close to Bilbao, and others nearly 19 miles to the northwest. The principal mass is elliptical in shape, about 2½ miles long by 1½ miles wide. Its thickness is unknown, but workings have been carried in it to depths in some places of 246 feet, and in others of 105 feet. It consists chiefly of brown hæmatite, with here and there blocks of unaltered spathic ore. The ore contains, in its undried state, from 50% to 64% of metallic iron, with about 1% of manganese, and little phosphorus or sulphur. It is of cretaceous age, being in some places interposed between undoubted cretaceous strata, and has probably been deposited by hot springs highly charged with carbonate of iron. In some localities the ore crops out on the surface, and is obtained by simple quarrying. It is all got by blasting, in open workings, and is conveyed, first, by ox carts or by wire tramways to the railway lines, and then by rail to the shipping places.

Two systems of wire-rope conveyance are in use, that of Hodgson and that of Bleichert. Bleichert's arrangement is the more recently introduced, and, though the more expensive system, is preferred, as being cheaper in working, and capable of carrying twice as much ore per day. In it the main cables are fixed, and serve merely as rails for the trams or tubs which are suspended from them to run on, and these are drawn along by a second lighter running cable. The cost of transport, for a distance of two kilometers (say 1¼ miles), is by Hodgson's wire-rope line about 7d., and by Bleichert's 4d. per ton.

The mines are connected to the shipping places by five lines of railway, either in work or under construction. The railway wagons are loaded by hand, and are end or bottom tipping. The shipping stages are of timber, and are generally normal to the river; the wagons being run out singly, emptied, and brought back. The ore is filled into the vessels through inclined shoots, or, in one instance, through a vertical "spout," over which the bottom tipping wagon is discharged. The average cost per ton of the ore, delivered on board ship, is approximately as follows:

	Francs.
Quarrying	1.30
Conveyance to the railway, by a Bleichert wire-rope line	0.46
Filling the railway wagons, carriage to the shipping place, and putting on board	2.08
Duty	0.13
Total	3.97 say 3s. 2d.

The bar at the mouth of the Nervion is a great obstacle to navigation. It practically closes the entrance during half of each month, and vessels of great draft can pass it only at spring tides.

The most advantageous type of vessel for the trade is a steamer drawing 13½ to 14 feet of water, carrying a cargo of 1,000 tons, and with engines of 100 to 120 HP. With such vessels, going out in ballast, the cost of freight from Bilbao to Calais or Rotterdam is about 7s. 8½d. per ton.

The quantity of ore shipped in 1877 was 964,533 tons; and in the first 10 months of 1878 it was 1,040,000 tons.—*Revue Universelle des Mines.*

About Bells.—In making large bells, loudness rather than pitch is the object, as the sound can be conveyed to a much further extent. This accounts for the enormous weight of some of the largest bells. St. Paul's, London, weighs 13,000 pounds, the bell of Antwerp, 16,000 pounds; Oxford, 17,000 pounds; the bell at Rome, 19,000 pounds; Mecblin, 20,000 pounds; Bruges, 23,000 pounds; York, 24,000 pounds; Cologne, 25,000 pounds; Montreal, 29,000 pounds; Erfurt, 30,000 pounds; "Big Ben," at the House of Parliament, 31,000 pounds; Sens, 34,000 pounds; Vienna, 40,000 pounds; Novgorod, 69,000 pounds; Pekin, 139,000 pounds; Moscow, 141,000 pounds. But, as yet, the greatest bell ever known is another famous Moscow bell, which was never hung. It was cast by the order of the Empress Anne in 1653. It lies broken on the ground, and is estimated to weigh 443,772 pounds. It is 19 feet high and measures around the margin 64 feet.

The Paradox Engine.—Among the many wonderful things in Power Hall, Cincinnati, is the Paradox engine, represented by Messrs. Tilden & Gray, of that city. In this engine there are no stuffers to pack or governor belts to break. It has no cross-heads to adjust, or eccentrics to slip, and as the moving parts are not exposed, there is no danger of getting caught in the machinery, nor is there any slinging or dripping of oil, which is such a disagreeable thing in many engines. Since no adjustment of the parts is required, any engineer, however unskilled, so he knows how to keep fire under and water in the boiler, can run it. As we have already maintained, perfection in mechanism consists in simplicity.—*American Inventor.*

Useful Information.

Splitting Paper.

It is one of the most remarkable properties of that wonderful product—paper—that it can be split into two or even three parts, however thin the sheet. We have seen a leaf of the *Illustrated News* thus divided into three parts, or three thin leaves. One consisted of the surface on which the engravings are printed; another was the side containing the letter-press, and a perfectly blank piece on each side was the paper that lay between. Many people who have not seen this done might think it impossible; yet it is not only possible, but extremely easy, as we shall show.

Get a piece of plate glass and place it on a sheet of paper; then let the latter be thoroughly soaked. With care and a little dexterity, the sheet can be split by the top surface being removed. But the best plan is to paste a piece of cloth or strong paper to each side of the paper to be split. When dry, violently and without hesitation pull the two pieces asunder, when part of the sheet will be found to have adhered to one and part to the other. Soften the paste in water, and the pieces can be easily removed from the cloth.

The process is generally demonstrated as a matter of curiosity, yet it can be utilized in various ways. If we want to paste in a scrapbook a newspaper article printed on both sides of the paper, and possess only one copy, it is very convenient to know to detach the one side from the other. The paper, when split, as may be imagined, is more transparent than it was before being subjected to the operation, and the printing ink is somewhat duller; otherwise, the two pieces present the appearance of the original if again brought together.

Some time ago the information of how to do this splitting was advertised to be sold for a considerable sum. We now impart it to all our readers gratuitously.—*B. and O. Printer and Stationer.*

Cast-Steel.—A London metallurgist claims to have produced a high quality of cast-steel at a considerably reduced cost by re-carbonizing fused metal. The Siemens or Bessemer process furnishes the required kind of metal, which, after being forged, rolled, and brought to the desired size and form, is submitted to a re-carbonizing process in closed vessels of any adequate heat-resisting material, and the carbonizing substances may be such as are employed in the usual cementing process. Wrought-iron vessels about five-eighths of an inch thick, and of such a form as will best suit the purpose for which the steel is intended, are preferred. The covers project beyond the sides of the box, in order to admit of their being firmly fixed with keys or wedges, and the interstices are then tightly filled with clay. An ordinary gas or reverberatory furnace may answer for the process.

Percussion-Locks.—The percussion-lock, it appears, was invented by an English clergyman—Rev. Mr. Forsyth—in the year 1807. In the year 1500, all fire-arms were fired by a lighted match carried in the hand. About 1510 the match-box was introduced, which was so far an improvement that the lighted match was attached to the gun. But a shower of rain was still an effectual damper of the hottest fight. Soon after the wheel lock was invented, which produced ignition by the rapid revolution of a steel wheel against an inflammable substance. This lock was in use during the wars of the Commonwealth. The well-known flint-lock was introduced about the year 1692, and was in universal use down to the battle of Waterloo. The percussion-lock, for many years after its invention, was only employed in the slaughter of birds and beasts.

Glass Water and Gas Pipes.—An important discovery has been made and patented by Capt. John B. Ford, of Jeffersonville, Ind. This is the manufacture of gas, water and sewer pipe from glass. The glass can be made from one-half to one and a quarter inches in thickness, according to the diameter of the pipe, and it is claimed that it will stand a greater pressure than iron. As the materials for its manufacture abound in all sections of the country, it is proposed to make it near where it is to be used. It is claimed that it can be made at a cost of $8 per ton, of course much less than is paid for freight on a large portion of the iron pipe now used.

Borax Water.—Borax water will instantly remove all soils and stains from the hands, and heal all scratches and chafes. To make it, put some crude borax into a large bottle, and fill with water. When the borax is dissolved, add more to the water, until at last the water can absorb no more and a residuum remains at the bottom of the bottle. To the water in which the hands are to be washed after gardening, pour from this bottle enough to make it very soft. It is very cleansing and very healthy. By its use the hands will be kept in excellent condition—smooth, soft and white.

Petroleum-Proof Cement.—A cement peculiarly adapted to stand petroleum or any of its distillates, is made by boiling three parts of resin with one of caustic soda and five of water. This forms a resin soap, which is afterward mixed with half its weight of plaster of Paris, zinc white, white lead, or precipitated chalk.

A Quicksilver-tight Flume.—Mr. Bryan Tyson, of this city, says: "It is difficult to so construct a flume of great length that a leak will not occasionally occur. These leaks are most frequent where the ends of the bottom boards join together, and may be prevented as follows: Have the joints fit closely on the bottom side, but about one-fourth of an inch open on the top. Procure some white lead and reduce to a proper consistence with linseed oil. Next, a good supply of wedges of the proper thickness. Then coat well with the lead, and drive into the openings formed as aforesaid. Any defects in workmanship can thus be securely and permanently remedied. It is believed that the lead will prevent the wedges from working up, or at least I have never seen any, treated as above, work up. If you are situated near a box factory the wedges had best be sawed."

Belt Lacing, Etc.—Among the recent practical inventions is one patented by Mr. A. C. Krueger—a process for tanning rawhides for belting, lacing, etc. Mr. Krueger's process for preparing the hides for unhairing is by steam. After being unhaired, thoroughly fleshed and passed through the fresh water soak, they are removed to a bath containing a chemical solution which readily unites with the component parts of the hides. In due time the hides are taken out of the bath, thoroughly dried, and then placed in the stuffing wheel, where they are made to receive a due proportion of grease, and become very mellow. They are then placed on the stretcher and thoroughly stretched, and from there to the grease coureing table for the last finishing touch. Goods made from this material are said to give great satisfaction everywhere.

To Prevent the Cracking of Glue.—Glue frequently cracks because of the dryness of the air in rooms warmed by stoves. An Austrian paper recommends the addition of a little chloride of calcium to glue to prevent this.

Good Health.

Poisonous Fishes.

The *Scientific American* in alluding to cases of poisoning by eating certain kinds of fishes, says: Grave and even fatal accidents of this nature have usually occurred in the less civilized portions of the globe; and the phenomenon itself is very complex. There are a large number of suspected species; and in some of these certain individuals alone seem to be possessed of the toxic property, and even in these the danger resulting from using them as food disappears at certain seasons of the year. Finally, ichthyology is such a difficult study that few physicians are well enough acquainted with the subject to accurately determine the genera or species of the poisonous fishes that they meet with in their travels.

The *Annales d'Hygiene Publique* says that fish poisoning is one of the maladies that afflict Europeans living in Japan. The salmon is the most common toxic fish of Japan. From the spring onward this fish is out of season, and if eaten after that period of the year occasions the same accidents as follow the eating of tainted meat.

The eating of the *katsuo* (bonita) and the maguro occasions severe congestion of the brain and face, in some cases very serious. Some writers believe that it is a morbid element developed in the fish at certain seasons, or that the idiosyncrasies of the patient have something to do with it. This cannot be accepted as the true explanation, for it has been proved that certain fishes, the *Lethrinus nambo*, for instance—can be eaten with impunity until it attains a certain size, say a length of five to five and a half inches, after which it becomes poisonous. The age of the fish, then, would seem to have something to do with its toxic qualities.

Fishes of very diverse genera have been the occasion of grave and even fatal accidents, and they are found in all parts of the globe, but more especially in the torrid zone. Pappenheim gives a list of more than 40 poisonous species. Among these we find mackerels, perches, herrings, sea pikes, and a large number of species belonging to the order *Plectognathes*. The latter order contains five genera that are poisonous. The most common genus of the order in Japan is the *tetrodon* or swell fish, the species of which are all known by the general name of *fugu*, and are considered the most dangerous of the poisonous fishes, so much so, in fact, that their sale at certain seasons is forbidden by law. Dr. Goertz, of Yokohama, in a memoir read before the German Asiatic Society of Japan, has given a description of the symptoms observed in these cases of poisoning by the *fugu*. One of these was rapidly fatal, the other two were more alarming, but recovered under prompt treatment. At the beginning of the attack there were violent headache and nausea, quickly followed by great muscular weakness; the pulse, the respiration, and temperature all fell at the same instant, thus denoting the very energetic action of the poison upon the nervous centers with special effect upon the pneumogastric. Dr. Houghton, of Savannah (*Lancet*, 1876, page 939), mentions 13 cases of poisoning by the *Tetrodon Hystrix*—one of the Japanese *fugus*—in which the results were identical with those reported by Dr. Goertz. It is somewhat remarkable that in the three cases given by the latter, and in the 13 of Dr. Houghton, the subjects are stated to have eaten the eggs of the fish.

Congers, pikes, and barbels have long been recognized in Europe as poisonous at certain seasons, and the eggs of the barbel as especially so.

In Japan the liver of the *fugu*, immediately after the spawning season, is considered the most dangerous part of the fish. A few cases of death caused by eating the liver of the fish have also been reported from the Cape of Good Hope, the poison having proved fatal in some instances in less than 17 minutes.

Sea-Sickness.

Many "sure cures" for sea-sickness have been announced from time to time, but they rarely, if ever, prove effectual in all cases in which they are tried. The malady, like headache and dyspepsia, seems to be of many types and degrees, and a remedy that succeeds in one form or phase of it may utterly fail in another. It is well to keep the various methods of treatment in mind, and, if one chooses, he may test them in turn, until he is able to decide which of them is best suited to his personal case.

Dr. Lederich, a French physician, highly recommends the treatment of sea-sickness with collodion. This had been the means of warding it off from many who were peculiarly predisposed to suffer from it, and had suffered much before. The collodion is applied with a brush in three successive layers on the epigastric region (over the stomach) and the neighboring parts. It acts in such cases in the same way as in those of peritonitis, where it is a powerful anti-emetic. The *Algerian Journal of Medicine* reports another way of treating sea-sickness. M. Velasco advises injections of 0.005 grain and 0.02 grain of morphine, and says he has experienced its good effects on himself and his family.

A remedy, or rather a preventive of the malady, which we have not seen mentioned in print, but which has been tested and recommended by the physicians on some of the ocean steamers, is bromide of potassium. This should be taken in 20-grain doses, two or three times a day, and, to our personal knowledge, it has worked well in the case of some persons very sensitive to sea-sickness. Tourists will find it convenient to take with them to sea a solution of the bromide prepared of such strength that a teaspoonful contains 20 grains of the salt. This quantity can be taken in a third or half a tumbler of water. We have never known it to fail, but it would not surprise us to learn that it had failed in very desperate cases. One should begin taking it before being exposed, and should, if possible, get well under its influence before the time of trial comes. In many cases smaller doses would probably answer the purpose; they can be graduated according to the person's susceptibility to the influence of bromide. We have never known it necessary to use it to such an extent as to produce symptoms of bromism.

Typhoid Fever from Diseased Meat.—An epidemic of typhoid fever, interesting in its etiology, followed a musical festival at Zurich, in May, 1878. Out of some 700 assistants, 500 were attacked by the disease, of whom 100 died. The symptoms could not be mistaken, and the autopsies confirmed the diagnosis. A minute inquiry into the circumstances left but little doubt that the epidemic was due to the use of had veal furnished by an innkeeper of the place. It may be claimed by those who attribute to general causes the power of originating specific diseases, that the typhoid fever was due to a septic poison present in the veal, depending possibly on a beginning fermentation, which was not destroyed by the cooking to which it had been submitted. On the other hand, as the animal from which the meat was taken was sick, it may be asked whether it might not have been suffering from typhoid fever, although this disease has never yet been recognized among animals. It is a remarkable fact that in 1839 a similar but much less fatal epidemic occurred in a neighboring locality. After a reunion that took place under similar circumstances, 440 persons were taken sick with all the symptoms of typhoid fever. It is probable that in this case also the meat of a sick calf gave rise to the disease.—*Journal de Medecine.*

Sound Sense.—Sometimes children have a dislike to flesh meat, and when that is the case, it is the last thing that should be forced upon them; indeed, it is not improbable that children would be far better nourished by eggs, fruit, milk and farinaceous food than by flesh meat. "Perhaps," exclaims the Countess of Mountcashell, "we should all be healthier and longer lived if we had never learnt to devour the flesh of animals." Yet in many instances medical men persist in ordering a flesh diet for children who utterly dislike it. It is difficult to see the wisdom of such a procedure on any sound physiological ground whatever.

Chloral in Whooping Cough.—Dr. C. H. Smith reports that in 200 cases of this disease treated with chloral, he has in every case noticed a marked alleviation of the symptoms and shortening of the period of the disease. Only one case lasted seven weeks, and the majority of the cases were well in from two to six weeks. No other remedy was given.—*N. Y. Medical Journal.*

MINING AND SCIENTIFIC PRESS.

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The Week.

The week has been marked by a series of discoveries in precious minerals, which demonstrate what we have always maintained, viz., that there is probably more wealth still in the ground of this State than has been as yet taken from it. Nevada county, particularly, is looming up into increased notoriety. From the reported strikes in the gravel lead of Shultz & Co., near Greenhorn canyon, beyond Banner mountain, and in the Derbec mine, which latter, although denied, seems to be confirmed by reports later than the denial. The "Lone Tree" ledge, on Manzanita hill, an entirely new and unworked ledge, is creating considerable excitement. Many farmers in the Sierras, we are informed, have discovered good paying mines on their ranches, and are profitably combining mining and agriculture. From every quarter come rumors of a mining revival, which seem to indicate the return of the olden-times mining characteristics, without, however, an unhealthy excitement.

The saving of fine gold from tailings, heretofore considered valueless, continues to excite the ingenuity of miners in devising plans and devices for their profitable working. The old New York district at Ivanpah, in San Bernardino county, has become the scene of quite extensive operations, and mills are going up to work up rich ore.

Bodie is still working out good ore and the mines present an improved appearance.

There is no change of importance in the Comstock, with the exception of ore in the Union shaft. The other districts of Nevada are making new developments, particularly in Aurora district, where a very rich discovery is reported near the Real del Monte mill. Some complaints come from Colorado about Eastern parties putting up mining machinery and incurring heavy expense without investigating whether there was ore enough to support them, and finding none to speak of. Of course glowing accounts will always be regarded as truth by many, but more injury than good is done by over-estimates, disappointment under-estimating as much as over-estimating has exaggerated.

Hydraulic and Drift Mining in California.

A good deal of attention appears to be directed just now to the business of hydraulic and drift mining in this State. We say in this State, because the auriferous deposits that afford the best sites for this class of operations exist here under the most favorable conditions for easy and profitable exploitation, if they do not also here reach their greatest opulence and expansion. In some other of our west-lying countries these deep placers in a modified form are met with, but no where are they marked by those peculiar features that characterize them in this State, their origin being probably due to different causes. It is in fact doubtful whether those pliocene remains known as "dead or buried rivers," occur elsewhere than in California and, perhaps, in some parts of southwestern Oregon.

Commencing in Tuolumne, they can be traced through the more central mining counties of this State north through Trinity and Siskiyou into Oregon, where they cease or can be no longer identified. Banks of diluvial gravel are found in eastern Oregon, Idaho, Montana and Colorado, affording material often for large and profitable hydraulic washings, but there are under them none of these channels of ancient rivers, the distinguishing feature of the California pliocene deposits, and along which alone drift operations can be prosecuted to advantage.

A variety of causes have tended to awaken increased interest in this department of mining. In the first place, the inducements offered for engaging in the business may be considered generally good, this class of mines having paid with more uniformity if they have not always made such large gross productions as many of the ore-bearing deposits. The probable yield and accruing net profit can here be calculated in advance with so much closeness that the investor runs but little hazard in venturing his means where the conditions are at all favorable; and in this element of certainty the business finds its greatest recommendation, more particularly with Eastern investors, who are better suited where there is security with small and sure profit, than where there is only a prospect of big returns accompanied by extra hazard.

Again, this branch of mining is comparatively free from the troubles that so constantly beset vein operations through the necessity for deep exploration, the encountering of low-grade or refractory ores, the pinching out of pay chutes, etc. In its earlier stages, drift mining was attended with sore loss and disappointment by reason of the tunnels, designed for opening up and working these deposits, having been driven on levels that failed to subserve this end; and it was only after an experience running through years of trial that the levels on which these adits should be located came to be ascertained with much exactness. At present few mistakes of this kind occur; the bottoms of the gravel-bearing channels, if not already known, being determined by artesian borings before the exploiting tunnel is located. With this precaution observed there is little chance of error, where formerly nearly all was left to guess work. As a result many have felt encouraged to engage in enterprises of this kind who, with the old-time uncertainties hanging over them, would have carefully abstained from such undertakings. Many improvements have also been made in the ways and means employed for working these deposits, such as the introduction of locomotive engines for hauling in and out the cars, devices for securing better ventilation, increased water supplies, etc. With so much gained, drift mining, without undergoing any sudden or very marked advance, has experienced a silent but healthful growth for the past 12 months or more, with every probability that it will be able to keep up the same for some time to come, as this class of deposits is very extensive in different parts of the State, and but little water is required for working them. The several ridges that compose the Forest Hill divide, Placer county, notably the districts of Todd's Valley, Forest Hill, Bath, Iowa Hill and Damascus, the Liberty Hill divide, in Nevada county, and along the belt extending thence north through the old drift camps of Alleghany, Forest City and Gibsonville, to the head of Slate creek, Sierra county, constitute the principal localities of renewed activity in this branch of placer mining. On the rich bars along Trinity river there is also much more drift mining now being done than for many years past, the gravel here never failing to pay good wages.

While there is even more money being invested just now in hydraulic than in drift mining, the number of new enterprises of the latter kind being inaugurated is not correspondingly large, the difficulty of obtaining the quantity of water indispensable to their success tending to limit their number. Still, a good many hydraulic schemes have been set on foot of late, and never before has there been such a searching after new sources of water supply, and such efforts made to secure these franchises, as during the past summer. Every available stream and eligible reservoir site before neglected has been taken up, while water rights already located have everywhere assumed greater importance, commanding prices that a few years ago would have been considered extravagant and even preposterous. In all this we see only a proper appreciation of the value of these properties, and an earnest of the large proportions to which hydraulic mining is likely soon to attain, as well as the prosperous future that awaits this industry.

Mining Decisions.

The Secretary of the Interior has decided the appeal case of Chapman *et al.*, vs. Lanig upon the questions of fact. (1) That the land is not shown to be more valuable for mining than for agriculture. (2) That Lanig's pre-emption entry was not made in good faith. The facts of the case, which we gather from Copp's *Land Owner*, are substantially as follows: Adam Lanig filed a pre-emption declaratory statement for certain land in the Sacramento Land District, alleging settlement Sept. 1st, 1872. He made proof that the land was non-mineral in character on April 12th, 1875, and entered it on April 19th following. A patent was executed on Sept. 6th, 1876, but was not delivered. On March 28th, 1877, J. W. Chapman submitted his affidavit, alleging that the San Andreas mining company, of which he was a member, owned adjoining lands, and had placed machinery and improvements on said tract, valued at $5,000, by mistake, and that the correct location of said improvements was not known until a recent survey of the land was made. Chapman also claimed that the land entered by Lanig was mineral land, and known to be such by Lanig prior to his entry, and that Lanig had made an agreement for conveyance of the land prior to entry. From the evidence in the case, it was decided that the San Andreas company failed to prove that the land was mineral land, it appearing that it was more valuable for agricultural purposes, Lanig had made satisfactory proof of the non-mineral character of the tract prior to the investigation by the land office, and the burden of proof is upon the parties alleging the land to be mineral. Where lands have been withdrawn as mineral, the burden of proof is upon the person alleging them to be non-mineral, and applying to enter them under the laws relating to the disposal of agricultural lands; but when satisfactory non-mineral proof has been once made the rule is otherwise.

It appeared, however, that Lanig and one Leonard had purchased the possessory title to the land from Michael Shannon and wife, and about one month after filing his pre-emption declaratory statement an agreement was entered into by William Irvine, Adam Lanig and George Leonard in which it was stated that the land was to be entered under the mining laws. It appearing, therefore, from the evidence that Leonard was a joint owner of the land, and that Lenig's entry was made in part for Leonard's benefit, in direct violation of law. Besides this, the agreement shows that Lanig considered the land mining land, and was estopped to deny it. It was held, therefore, that the entry was based upon false proofs, and therefore fraudulent, and the patent ordered canceled.

In the case of John C. Phillips, Eureka, Nevada, the affidavits for continuous posting of notice on claim, and affidavit of compliance with mining laws, etc., in application for patent, were made by an attorney in fact for claimant. These affidavits must be made by the *claimant*; they cannot be made by an agent.

CORNISH MINES.—In a two-line item in our issue of the 9th ult., taken from an exchange, it was alleged that the "Cornish mines have been worked for over 1,000 years, and are entirely exhausted." We cannot say that we are sorry the item appeared, since it has led the effect of calling out information from C. Le Neve Foster, of Truro, Her Majesty's inspector of mines, which would not have been the case had the item not appeared. Mr. Foster, in a personal letter to us, says: "So far from the Cornish mines being exhausted, we are raising more tin than ever. The deepest mine, Dolcoath, 2,280 feet deep, produced last year 1,524 tons of dressed tin ore, which shows that we need not be afraid of depth. I can safely say that Cornwall could easily produce half as much tin again, yearly, if the price were to rise a little. I do not believe that the child is born that will see Cornwall exhausted."

A CHEAP MILL.—A complete 8-stamp mill was bought in Jim Crow canyon, Sierra county, for $150 a few weeks since. The mill, with its engine, boilers, etc., originally cost some $16,000, and only ran two weeks. It has been idle now for some four years, and was bought for the ridiculous sum mentioned to be put in another mine. It is only one of the instances of having a mill and no mine. The engine and boiler were not purchased, as it was impossible to get them out of the canyon where they were without more expense than new ones could be bought for. A mine without a mill is better than a mill without a mine.

TO-DAY there are 7,000,000 barrels, of 40 gallons each, of crude petroleum above ground in the oil regions. This vast amount of heat and light is going a-begging at 60 cents a barrel, and every hour adds to this ocean of oil, and in spite of the enormous consumption the stock accumulates.

Spontaneous Fracture of Castings.

A large number of disputes arise from the discovery, after use, of fractures in castings. In many cases these fractures are sufficient to destroy the further utility of the castings, or are of such an extent as to render them untrustworthy. In either case, whether the fractures are large or small, they give rise to an accusation against the manufacturers of unsound work, and the reply on their part is unfair strain upon the work, as the castings were sound enough when they left the foundry. It is perfectly possible for castings to be quite sound when they leave the foundry and yet for them to break, apparently spontaneously, after they have been in use, or work, for some time, and this, too, without any great or undue strain upon them. Such fractures may certainly be attributed to neglect on the part of the founders to consider that a casting, when cooling, re-arranges its internal particles or crystals so as to contract upon itself. If this re-arrangement is allowed to go on quietly, and without opposing strain or hindrance, a good sound casting is obtained. If, however, cooling is unduly hurried, or a resistance is set up to the necessary contraction, in the first case an abnormal arrangement of the crystals is obtained, termed "chilled," and in the second place a considerable tension, more or less, is set up in the material to resist its ultimate contraction upon itself. The result, as to whether this resistance to contraction shall at once decide the fracture of the casting in the mold, or whether the fractures will not appear until after use, is simply a question of amount of strain set up in the material, and its power of elasticity and tensional resistance to such strains. As, for instance, supposing that the fluid cast iron requires to shrink ½ of an inch in a foot in becoming cold, and a rigid resistance is offered to the whole of this contraction, the limit of tensional resistance of the material is exceeded, and the casting must part in the mold. As, however, we know that the average resistance to tensional fracture of cast iron is about 7 tons per square inch, and, further, that the modulus of elasticity of cast iron is 8,214 tons per square inch, the ultimate breaking tension of 7 tons would correspond to an elongation of about 1·50 of an inch in each foot. Any resistance to contraction, then, within this amount—viz., a resistance to 1·50 of an inch, out of the whole ½ of an inch per foot contraction—would set up a considerable tensile strain in the material, but of just smaller amount than 7 tons per square inch, which is the breaking strain. Under such circumstances, then, the casting would not necessarily break in the foundry; but a severe shock in handling or tooling the casting may effect the rupture of the part thus abnormally strained very nearly to its breaking point. In ordinary use, also, if forming part of a pumping plant, the continual jar and shock of the pump valves are eminently calculated to decide the fracture of material under undue tension.

Change of temperature is also a powerful circumstance in deciding the ultimate fracture of a casting, which may have been unduly strained by retarding contraction in the foundry, as, for instance, a steam cylinder which is subjected to a considerable range of temperature, or hot and cold water pipes and castings. Even the different temperatures of ordinary weather are sufficient, in many cases, to decide rupture. In all cases of such spontaneous fracture the cause may usually be easily perceived, both from the character of the crack and the form of the casting.

In many cases a crack will develop in the main body of the material, and has its widest part at the center, where often the material is strongest, tapering away imperceptibly at the ends, which do not nearly reach the edges of the casting. Such a crack can clearly only result from internal tension amongst the atoms. This species of fracture may occur in a flat plate, more particularly if it has a large boss in the center. The irregular contraction occurs in this way: The outside rim naturally cools first, and stretches on the hot interior, or compresses the latter in its cooling grip. When, now, the boss and center at last cool, the outside rim has a fixed dimension and is already rigidly set. The center and boss, in cooling, must now occupy less space than they did when hot, and must thus tend to draw away from the rigid exterior. If this resistance to contraction be not too great, and the material have a good elasticity, it is possible that fracture does not occur at the actual cooling, but the whole interior of the plate becomes under a condition of very great and abnormal tension. Under exposure to cold and heat, or even to the ordinary vicissitudes of the weather, this plate will, sooner or later, crack in the way described; that is, a crack will commence to develop at the center and travel towards the edge, but probably stopping before reaching the outside of the plate, so as not to split it actually in two.

The form of casting that develops such fractures must of necessity be in the shape of a rigid exterior circumference or surface, which has first cooled, and of an interior surface or tie, which, cooling after the setting of the exterior, tends in contracting to draw away from that exterior, and thus sets up a very considerable tension in the interior material. The primary fault lies with the designer, in sending to the foundry a casting in form predisposed to such accident.

Manning's Process for Working Ores.

The essential features of this new process are to crush the ore in the battery with hot water and salt, and as much bluestone as the amalgamator will not find to be injurious to the screens; then to run the pulp from the battery through an inclined revolving screen, which will take out all the water desired, and prepare the pulp to run to the pans at the proper thickness for amalgamation. The pans are 5½ feet in diameter and 3 feet deep, one above the other, or in steps, from the battery, arranged so that one pan discharges into the other continuously. The ore is not handled from the time it enters the rock-breaker, but kept in a continual move from the rock-breaker to self-feeder; thence to the battery; from there through the revolving screen into the first pan; from it into the next, and so on through each pan and into the settler. From the settler it runs into a large box that will hold, say, five tons of pulp, together with the water. The mill is provided with two of these boxes, and when five tons, or about that much, is collected in the box the spent from the settler is turned into the other box, and the one run full allowed to stand four or five hours, or until the water becomes clear. It is then conveyed by pipe or hose to a tank, from which it is pumped into the hot water tank that supplies the battery. This manipulation of the water makes a saving of nearly one-half the salt and a portion of the bluestone. This return water will sometimes get base, and it is sometimes necessary to precipitate the bases by using the corresponding precipitants once in three or four days; a batch of this water is let run off altogether, and replaced with fresh water.

The shape of the pans for this process is shown in the engraving. The blades, or wings, in the pans are about 26 inches long by 7 inches wide and 1½ inches thick. The blades are set to meet the current of the pulp in an oblique manner, so as to prevent the pulp, when discharged into a pan, from sinking too fast to the bottom. The quicksilver in this process is introduced into the second pan from the battery, and is allowed to drop in continuously from a large quicksilver reservoir placed above the pan. The quicksilver never gets to the bottom of the pan and stays there in this process, from the fact that it is continuously fed into the first pan, and is continually running from the first pan into the second, from the second to the third, from the third to the fourth, and from the fourth into the settler, from the settler into the bowl at the bottom, thence into the strainer-bag; from thence the amalgamator, at his leisure, returns the quicksilver to the reservoir above the second pan, and removes the amalgam as often as is necessary. Three pans would be plenty to accomplish good results and do good work, but pans are liable to get out of order at times, consequently the inventor prefers having four pans for every ten stamps; if then one pan should get crippled a small spout is provided to run the pulp over or around the crippled pan, while it is stopped and repaired.

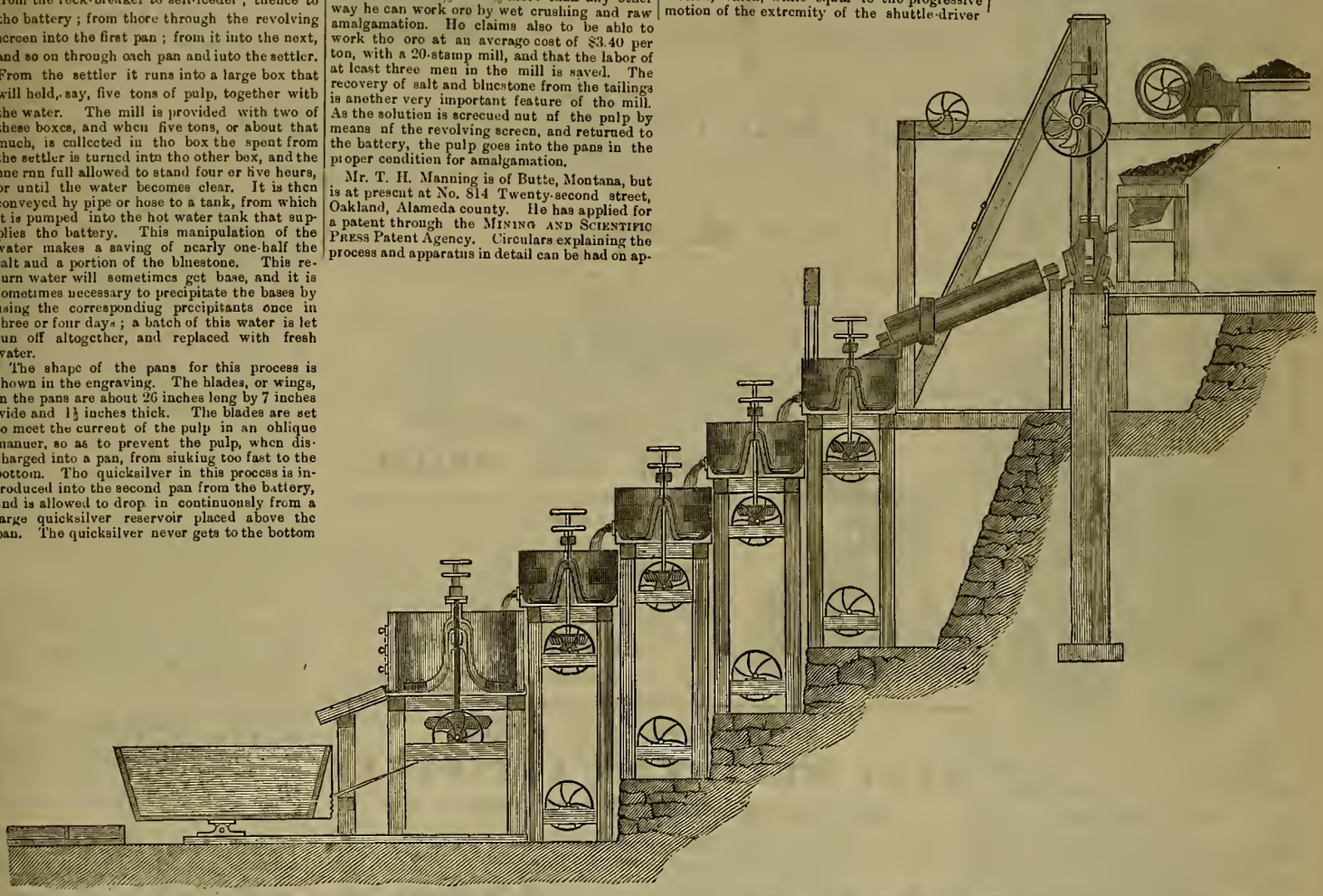
The box at the tail-race is provided with a shaft under the middle, and a ratchet and lever at the end. As soon as the clear solution is drawn off, the operator, by means of the ratchet, elevates one end of the box, introduces a two-inch hose with water, and runs the contents of the box into the tail-race.

The contrivance conveying the pulp from the battery to the revolving cylinder is of sheet iron, and made with descent enough to empty the pulp on the middle of the revolving drum. This drum is constructed of a net wire cylinder, 14 inches in diameter and 10 feet long; over this drawn a sack of unbleached muslin, of medium strength or thickness, as the ore under treatment may require. For ore of a soft nature carrying talc and earthy matter, the muslin should be very thin; for ores carrying heavy mineral and silica, a heavier material should be used. The net-wire cylinder, together with the muslin sack drawn over it tight, is then inserted in a revolving drum. The drum is made of sheet iron, a little larger than the wire cylinder, and on the inside is made fast one-half inch square iron or wooden bars, which are set in an irregular shape. Then the water is permitted to run around them and the outside of the muslin until it finds its way to the low end of the drum, where it is allowed to pass out and be returned to the heating tank to again pass through the battery.

The screen thus revolving discharges into the pan. The construction of the pans is somewhat peculiar, so as to make more than the usual friction.

The important feature for silver ores, as will be seen, is the crushing in the battery with salt and hot water. The inventor claims that when the silver ore is fractured by the stamps, in the presence of a hot solution of salt and bluestone, it takes up chlorine from the salt instantly; that it does it quicker and more effectually than at any other time; that the salt can be introduced into the ore for amalgamation; and that he saves from 10% to 15% more than any other way he can work ore by wet crushing and raw amalgamation. He claims also to be able to work the ore at an average cost of $3.40 per ton, with a 20-stamp mill, and that the labor of at least three men in the mill is saved. The recovery of salt and bluestone from the tailings is another very important feature of the mill. As the solution is screened out of the pulp by means of the revolving screen, and returned to the battery, the pulp goes into the pans in the proper condition for amalgamation.

Mr. T. H. Manning is of Butte, Montana, but is at present at No. 814 Twenty-second street, Oakland, Alameda county. He has applied for a patent through the MINING AND SCIENTIFIC PRESS Patent Agency. Circulars explaining the process and apparatus in detail can be had on application, by letter or in person, at above address.



ARRANGEMENT OF APPARATUS FOR WORKING ORES BY MANNING'S PROCESS.

A UNIQUE MINE MODEL.—We were shown, a few days ago, by J. S. Byington, a miniature model of the Diamond Peak mine of Nevada county, done in plaster and wood by Mr. Elkins. The outside of the model is a perfect representation of the topography of the county in the vicinity of the mine, with the buildings, works, etc. It is built in sections, and upon being taken apart discloses all the underground features of the mine—shafts, levels, tunnels, veins, stopes, etc.,—in perfect imitation. The model has been sent East, and is a suggestion in the right direction towards affording a practical illustration of what cannot so well be derived from the examination of maps. With it, the features of the country and the workings of the mine may be studied with nearly as much profit as a personal investigation of the mine itself.

GOLD IN FRENCH GUIANA.—Large numbers of miners from Cornwall, California and British Columbia, says the *Colonies and India*, are in Guiana attracted by the late discoveries of gold. Rich diggings have also been found in Surinam and Cayenne, which promise to eclipse the riches of California and Australia. One miner with four weeks' labor realized 40 pounds of pure gold. Similar proofs of the abundance of precious metals are numerous. The crowd of prospectors coming to these deposits cause fear that complications will arise through the conflicting interests of English, Hollanders and French, as well as the inhabitants of Venezuela and the Indian tribes. The auriferous deposits lie principally upon the confines of the territory of four different nations, the boundaries to which have never been determined, so that the future of the diggings is very obscure.

Recent Decisions Relating to Patents, Trademarks, Etc.

By the Commissioner of Patents.

Looms—Greenough vs. Drummond. Decided August 26th, 1879.

1. Subjects of interferences are not words, but things; and the same words must mean the same things in their application to two different devices in interference.

2. A claim for a shuttle-driver embracing a device accurately described as a roller, the function of which is to press (the warping threads being interposed) against a corresponding roller in the shuttle itself with a backward motion, which, while equal to the progressive motion of the extremity of the shuttle-driver does not result from frictional contact with the belt occasioned by the progressive movement of the shuttle-driver, the effect being to drive the shuttle in a circular race without displacement of the warp threads, does not interfere with a shuttle-driver containing a device described with like accuracy as a roller, the function of which is to raise an advancing ridge on a strap made fast at either end, which advancing ridge drives the shuttle in a straight race, the effect of the rotation imparted to the roller by its frictional contact with the strap being to diminish the friction between the shuttle-driver and the strap.

By the Acting Commissioner of Patents.

Sheet-Metal Cans—Green *et al.*, vs. Field. Decided July 25th, 1879.

1. The knowledge and use of a completed invention, which shows that it was actually completed and capable of working, if made before the invention of the patentee, is sufficient to defeat the claim of the patentee to priority, although the article invented had been lost or destroyed.

2. To constitute forfeiture to the right of a patent, the evidence must be conclusive in showing that the conduct of the dilatory applicant amounts to such acquiescence by him in the use of the invention by others, or in the claim by another as its inventor, that he is thereafter estopped in asserting title in himself.

3. It is difficult to distinguish forfeiture from abandonment or dedication of a complete invention to the public by the original inventor; but a delay to file an application for a patent, after a patent had been granted to another for the same invention, which was solely the result of advice received from joint applicants' attorney, and on which they reposed in good faith, and not passively, does not amount to forfeiture or abandonment.

Ice Planes—Ex parte Thompson. Decided August 11th, 1879.

1. Neither the law nor the rules make use of the term "statement of invention," and, of course, do not require that such a "statement" should occur at a certain place in the specification.

2. They contemplate, however, that an applicant shall, at the outset of his specification, point out the particular art, machine, article or composition of matter to which his invention relates, so that the remainder of his specification may be read with reference to some object clearly had in view.

3. The exact scope of the invention as the applicant intends to claim it, need be stated only in the claim itself.

4. A proper designation of the invention, a clear description of its parts, operation, and relation to surrounding matter, a distinction between it and what is old, and well-defined claims, are all that can be required in a specification.

RESOURCES OF CALIFORNIA.—A new edition of the "Resources of California," the well-known work of reference written by Mr. John S. Hittell, has appeared. The new matter brings up to date all information concerning population, wealth, debt and taxes, railroads, manufactures, etc. The most important portion of the new material is comprised in a chapter on "pulmonary climatology." Mr. Hittell has compiled a great deal of useful and valuable information on therapeutic climatology which proves that the hygienic advantages of California were not exaggerated when our information was less accurate than at present. The tables of relative humidity of various places are also useful. This is the seventh edition of the "Resources of California," a book which is valuable to any one desiring information of any kind concerning this State, and which has, since the first edition, been looked upon as the only reliable work on the subject. The information on the various subjects is in a convenient form, and the skill of the compiler has enabled him to present his facts in a manner which renders them easy of reference.

THE Cerrillos mines of New Mexico, which are considered in New Mexico as the rivals of Leadville, increase in richness as the shafts are sunk. The lack of capital has caused much delay, which has been increased by the fact that the Atchison, Topeka & Santa Fe railroad is being built almost directly to the mines, and will reach there about December 15th, which has caused many to postpone active operations till then.

Business Directory.

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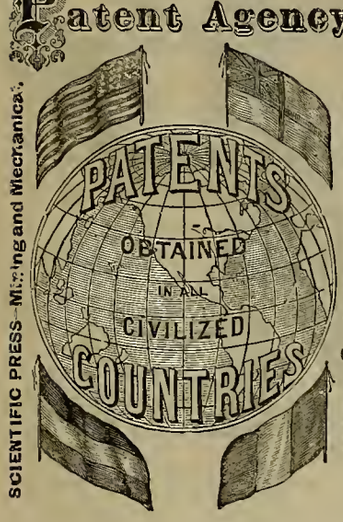

THE MINING AND SCIENTIFIC PRESS PATENT AGENCY was established in 1860—the first west of the Rocky Mountains. It has kept step with the rapid march of mechanical improvements. The records in its archives, its constantly increasing library, the accumulation of information of special importance to our home inventors, and the experience of its proprietors in an extensive and long continued personal practice in patent business, affords them combined advantages greater than any other agents can possibly offer to Pacific Coast inventors. Circulars of advice, free.

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— PATENT —

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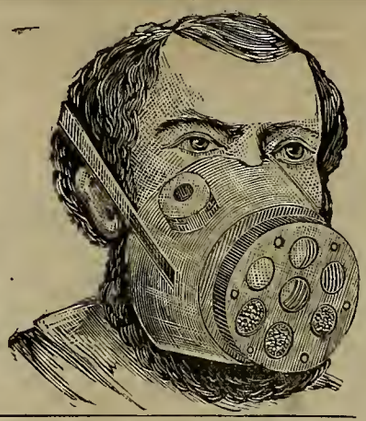

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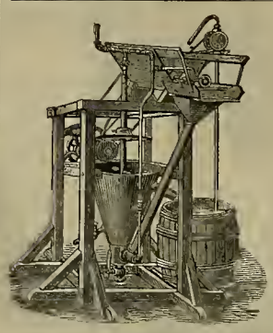

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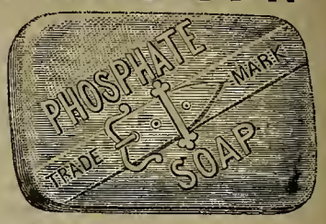

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Not only for daily use on the face and hands, but for bathing the entire body, there is nothing equal to PHOSPHATE SOAP. It is a thorough disinfectant and removes offensive odors of every kind.

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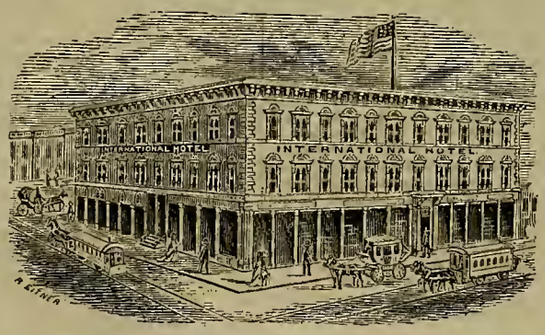

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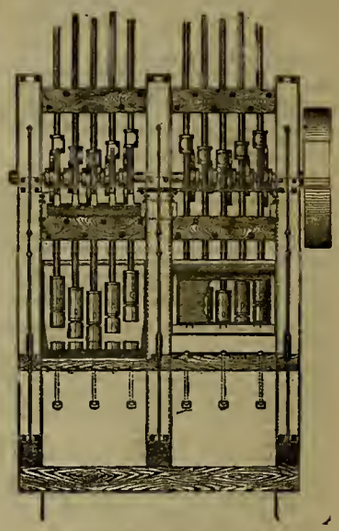

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[CONTINUED FROM PAGE 213.]

every indication goes to show that this newly discovered ore body is of no mean dimension. A large number of assays range from $72 to $900, being the highest and lowest assays made up to that time. This ore has a little spar running through it, but as progress is made into the ore the spar disappears. Superintendent Gould is of the opinion that he has not struck the main ledge, but is getting close to it.

RAYMOND & ELY.—The Superintendent says: We are taking out considerable ore from the 9th level, but it is low grade; on the 10th we are not taking out much; on the 11th the future prospect is very encouraging and have a good body of ore.

BELMONT DISTRICT.

BELMONT.—*Courier*, Sept. 27: The mine will soon be producing plenty of rich ore. Ore body south of shaft looks huge, and stope is getting larger every day. It is expected that this part of the mine will yield $50,000. Ore bodies in ground north of shaft are more extensive than at first supposed.

SPRING VALLEY DISTRICT.

PLACER MINE.—*Silver State:* Robert Pfluger informs us that Lew Dunn, who is engaged in placer mining near the Eagle mine, in Spring Valley, frequently takes out an ounce of gold a day with a rocker. Water is very scarce at present, there being scarcely enough of that fluid to run one rocker steadily.

TUSCARORA DISTRICT.

INDEPENDENCE.—Battle Mountain *Messenger*, Sept. 27: The south drift on the 172 level has been extended 62½ ft since the 5th inst., the ledge in this drift has varied in width from one to three ft, low grade chloride ore. An upraise will be started to-morrow to connect with winze from the 90 level. The ledge in this drift averages about three ft in width, carrying some very rich sulphuret ore, but averages low; connection has been made with the north winze, showing a continuous vein between the 300 and 400 levels, some portions of which is $100 ore. The chloride stopes are not yielding as well as usual; ore, low grade.

BELLE ISLE.—The ledge in the 150 level, north drift, is increasing in size and the ore improving in quality. The lateral drift in the hanging wall vein, 150 level, has been extended for the week 12 ft. The vein will average 12 to 14 inches of rich sulphuret ore. The winze on the 150 level has been sunk 11 ft for the past week; have cut the ledge and are now sinking on an incline with the ore vein, which is 20 to 22 inches wide, of first-class sulphuret ore. The stopes are looking and producing well.

NORTH BELLE ISLE.—The north drift, 70 level, has been extended 10 ft on a vein of ledge matter interspersed with rich ore.

TUSCARORA M. & M. Co.—The ledge in the face of the tunnel is about 2½ ft wide, from 6 to 8 inches of which is fine looking chloride ore, balance low grade.

CORNUCOPIA DISTRICT.

LEOPARD.—Battle Mountain *Messenger*, Sept. 27: Since the date of last report the connection between the 700 and 800 levels has been made and a good circulation of air obtained. The crosscutting on the 800 level is being advanced with all possible speed. We are extracting some good ore from the 700 stopes. Will start stopes from the 800 level as soon as the face of the main drift is far enough advanced. The mill continues to run on tailings and is doing good work. Will commence milling ore on the 1st prox.

AURORA DISTRICT.

RICH DISCOVERY.—Bodie *News*, Sept. 27: A rich discovery has been made in the rear of the old Real del Monte mill. Two prospectors were going over the hills, when one of them noticed a boulder having a mineral appearance, and impelled by the instincts which rule all prospectors, one of them broke off a piece of the rock. Our informant tells us that free gold was thickly interspersed through the quartz in such quantities as to eclipse in richness even the famous Bodie bonanzas. Further search resulted in uncovering a ledge three ft wide of rock similar to that described, and the news of the find was at once communicated to parties in Aurora. It is reported to us by a man whom we consider reliable, that the ledge, on examination, appeared so valuable that one of the men, whose name we failed to learn, accepted an offer of $7,000 for his interest, and left on the evening's stage. The story comes to us so straight that we cannot doubt its truth, and, knowing, as all do, the immense richness of rock found in Aurora many years ago, we must believe that the long-sought ledge has been found at last.

PARADISE DISTRICT.

BULLION.—*Reporter*, Sept. 27: From a gentleman just down from Spring City, we are informed that a very rich streak of ore was struck in the Bullion mine a few days ago, and that that mine is now producing more and better ore than it has at any previous time. The Sedan mill is kept constantly running on Bullion ore.

ARIZONA.

NEW DISCOVERY.—*Expositor:* A Mr. Tilden came into Phœnix with several large pieces of what we think is rich argentiferous galena ore. On inquiring we were informed that Mr. Tilden discovered a vein of this ore which is 15 inches wide, about 20 miles north of Phœnix, near the Cave Creek country.

TOMBSTONE.—Tucson *Citizen:* The Lucky Cuss has increased its working force and already a fine pile of ore is on the dump, which will be transferred to the new Corbin 20-stamp mill as soon as completed. From the quantities of rich ore in the camp it is safe to predict that, with the excellent mill of the Tombstone Co., and the new mills now in course of construction, Tombstone will be able to ship $300,000 worth of bullion monthly.

GLOBE DISTRICT.—*Silver Belt:* The Nugget Co. are timbering their main shaft which is down 100 ft. When that is done they will crosscut the ledge and also sink another 100 ft and again cut the ledge. The same company have also another shaft down 60 ft on a spur which runs from the Mack Morris side ground and about 60 ft from the Mack Morris south line. It also shows good ore, silver glance, and will assay at least $1,000. The pay streak is two feet wide. Ore from the Julian mine, worked in the Isabella mill gave a return of $567.58.

COLORADO.

ACTIVE MINING CAMP.—Georgetown *Miner:* On Collier mountain, in the Modoc, with a 200 ft tunnel, yielding a large quantity of a fine quality of bismuth ore, which mill runs 700 ounces; also the Lancaster lode, with one tunnel 240 ft in length, and one 180 ft long, showing a crevice of 5 ft, a gray streak of 10 inches, assaying 140 ounces in silver. The Waterman lode, near the Modoc, contains bismuth of a very fine quality. The Fairview lode mills 300 ounces of bismuth ore. The Hannibal has a tunnel of 200 ft in length, bears a vein of lead from 18 to 24 inches, interspersed with gray copper. On Glacier mountain are the Woodchuck, Walker, Bell East and West, Herrman, Tiger Extension and St. Cloud lodes, all yielding a large quantity of a fine quality of galena, carbonate of copper and gray copper ore. The Walker lode is opened by a 200 ft tunnel and mills 400 ounces. Dozens of other good paying mines might be mentioned. All are being worked energetically. Messrs. E. C. Guibor and J. W. Sueisher have just opened a fine prospect, the crevice of which is five ft wide, and galena is found through the entire width.

IDAHO.

NEW MINE.—*World:* The company that discovered the ledge at the head of California gulch, near Placerville, a few weeks ago, obtaining enormous prospects, are at work on it. They are stripping off the surface, and extracting the rock to a depth of a few ft. The vein is very narrow, being only from two to three inches wide, the ore decomposed and resembling sticky clay. It yields $25 to the pan, of very coarse gold. J. W. Davison & Co. own the south extension of it, on which they have a shaft down 22 ft. They have rich ore, but not as good as that in the location at the head of California gulch. Their shaft is four ft wide, and has not come in contact with either wall. All the rock in it prospects.

ATLANTA CITY.—*Statesman*, Sept. 25: Mr. Kelly, the editor, recently visited the mines at Atlanta, and in a resume of his visit, says: At the Buffalo company's mill, one mile below town, we found some very high-grade ore from the Pilgrim mine, in the Alturas Lake district, ready for crushing. The mill is in excellent order, and well supplied with every facility for the speedy crushing of ores. At the Monarch company's mill we found Mr. Robinson busily engaged running the pans and concentrator on the rich tailings which have accumulated from former crushings. The Monarch company have discovered several good ore bodies in their numerous tunnels and crosscuts, and are now engaged in sinking a huge shaft of three compartments. The dimensions of the shaft are 16x7 ft outside the timbers, which are one foot square. It is the intention of company to continue sinking upon the mine and running tunnels and crosscuts until their ground is thoroughly prospected and developed. About 500 tons of rich ore from the mine is under contract for crushing at the Buffalo mill. Peddler & Davis, the owners of the Tehama mine on Atlanta hill, have large quantities of good ore on the dump and in the chutes ready for crushing. This mine is well opened, and shows a continuous body of good ore. George Tims, on the Moultrie and Jessie Benton mines (now consolidated) has struck rich ore on the upper levels, and will soon commence operations on a large scale. In the Alturas Lake and Wood River districts, very rich discoveries continue to be made; some of the veins rivaling in size and richness of the ores the far-famed Atlanta lode.

Solving the Debris Question.

A plan for disposing of the debris question, and preventing their accumulation, has been proposed by W. C. Schaffer, of Sutter county, of which the Colusa *Sun* says: He proposes to take the whole of the Yuba river, at ordinary stages of water, through a double flume, down into the low lands between the Yuba, the Sacramento and American rivers. Mr. Schaffer proposes a double flume, with riffles in each, for the purpose of running one of them at a time, and catching the fine gold. He thinks the gold thus caught would pay the interest on the cost of the flume, which he estimates at $10,000,000.

The flume as proposed will be 50 miles long, 100 feet wide, 8 feet in depth with a partition in the center. The entire Yuba river is to be run through this flume and the tailings deposited on the tule lands of Sutter county. The water in the flume will have a velocity of several miles per hour on a fall of one inch to the hundred feet.

The plan is an enormous one, and with amount of the estimate at hand could be accomplished. The *Sun* further says: Under this plan the whole basin, some 100,000 acres, would have to be condemned. The flume could then be carried to that part of the land nearest the foothills first, and that filled in, say 20 feet above the bank of the river, and then moved toward the river, making land as it went. It would take two or three generations to fill the whole in, but a great deal of good land would be made every year, which would help to pay for the flume. This debris land is, after a few years, fertile enough, but the trouble now is that it ruins the land by washing over it every year. Land built up after the manner we have suggested would not be subject to overflow, and in a few years would become good land.

In connection with the same subject, the Grass Valley *Union* says: There have been a number of suggestions as to the disposition of the mining debris, but there has been no engineering done to serve as an intelligent guide in providing a remedy. This prerequisite will soon be furnished, as State Engineer Hall, assisted by Col. Von Schmidt and J. F. Alhart, both able civil engineers, are now with a full corps of men making an instrumental survey of the South Yuba river, to ascertain its fall, the extent of washing and deposits, and to obtain such other information as will serve as a basis for formulating a practical plan for regulating the deposit of debris, in order, if possible, to make it useful instead of an injury to the low lands of the valley. The engineering corps has worked up as high as Purdin's Crossing of the South Yuba, on the Nevada and San Juan road, and it is understood that their survey will extend up the river as far as hydraulic mining is carried on at present, or likely to be in the future.

ENCYCLOPEDIA OF INDUSTRIAL ARTS.—Spon's Encyclopedia of Industrial Arts, Manufactures and Commercial Products, of which we made mention several weeks ago, has now reached its sixth part, and the publication fully justifies the promise of thoroughness and freshness of fact and style, which the earlier issues on theld. Part V. continues the exhaustive treatise on the alkalis which began in the preceding part; 27 closely printed pages being devoted to potash. The treatment of this important substance, in all its points of derivation, manufacture and uses, is full and accurate, and well illustrated. There follow 38 pages of similar character on soda. The illustrated descriptions of the best processes of manufacture are among the clearest and most comprehensive ever written. Part VI. contains a group of important themes including alloys, amalgams, arsenic manufacture, assaying, atomic weights, aerated waters, beer, etc. The encyclopedia has already demonstrated its value as a source of information for manufacturers, the trade and the general reader, and we have no doubt this high character will be maintained. The work will be completed in about 30 parts, and will constitute in itself a condensed library of reference on industrial topics. The publishers are E. and F. N. Spon, 446 Broome street, New York city.

THE free delivery postal system goes into effect at Sacramento on October 2d, with 5 carriers, 2 of whom will be mounted.

News in Brief.

GERMANY has sent a scientific mission to Africa.

A VICTORY has been achieved by the Bolivians at Coloma.

INDIAN troubles are again reported from Boise Basin, Idaho.

THE German quarrel with Japan is said to be getting more serious.

SCOTCH, English and Swedish farmers are emigrating to America.

IMPORTS of specie at New York last week aggregate $8,557,542.

The hop crop in England this season is the smallest since 1860.

ALL quarantine restrictions against New Orleans have been removed.

THE United States Supreme Court meets in Washington, October 13th.

CABUL is still in a state of anarchy, and the gates of the city are closed.

PORTLAND, Or., is to have a free postal delivery, commencing October 1st.

CARS are being run in New York now on schedule time by compressed air.

THE British troops continue to advance on Cabul, accompanied by the Ameer.

THE Mercantile Mutual Marine Insurance Co. of N. Y. has closed up its business.

SILVER in London, 51½; consols, 97 15-16; 5% U. S. bonds, 106⅝; 4s, 105⅝; 1½s, 109½.

THE election of Sir Francis Wyatt Truscott as Lord Mayor of London is announced.

GERMANY will probably participate in the proposed International Money Conference.

GOLD and silver coin is hereafter to be paid out freely for all Government obligations.

DISTURBANCES are imminent at Tipperary, Ireland, in connection with the land troubles.

THE Russian expedition against the Tekke Turcomans is in urgent need of reinforcements.

THE Philadelphia mint coined in September: silver dollars, $1,808,050; minor coins, $14,737.

THERE is a scarcity in the Treasury at Washington of gold in denominations of less than $20.

IT is reported that 28 prospectors have been massacred by the Indians in southeastern Utah.

SPECIE in the Imperial Bank of Germany decreased during the past week 4,806,000 marks.

THE claim of the right to use the military roads in Bulgaria has been conceded to the Turks.

A GENERAL strike of all the trades in the United States and British North America is on foot.

A TWO days' fight took place in Texas recently between Indians and hunters, seven of the latter being killed.

AT Liverpool wheat is quoted at 9s 10d@10s 6d for average California whits, and 10s 9d@11s 2d for club.

UNLESS there is some change soon, it is feared that the cotton industry in France will come to a standstill.

LEGITIMIST banquets were given at several places in France in honor of Count de Chambord's birthday.

THE excess of exports over imports for the year ending Aug. 31st, 1879, amounted to $289,709,341.

THE walking match at New York ended last Saturday night, Rowell winning the belt—making 530 miles.

PINE tree cones, which contain the seed, are being exported in large quantities to Europe from British Columbia.

THE Public Stock Exchange of Todd, Williams & Co., at Philadelphia, suspended payment Sept. 30th. Liabilities, $250,000.

Gold and Silver Products of Mexico.

It appears from the N. Y. *Economist* that the registered coinage of the Mexican mint, and statistics gathered by Baron Humboldt and other reliable authorities show the yield of her gold and silver mines, from 1521 to 1876, to have reached the sum of $3,498,140,421. This array of figures indicates pretty clearly her capacities for bullion production. Some idea of prolific character of the mines and mining districts in that country may be gained from the following figures, denoting the yield in a few cases:

Biscennia Silver Mines	$ 10,341,000
Santa Ana " "	21,347,210
Valeneta " "	31,813,480
Rio Grande District	650 000,000
Sierra Madra "	800,000,000
Veta Madra "	335,935,730

The Panilian silver mines produced $20,000 per diem for five years, when operations were stopped by a flood of water. After being opened again, it produced in ten years $40,000,000. It again laid idle until 1871, when work was once more resumed, and an annual yield realized of $13,400,000, making a grand total of nearly $100,000,000. All this vast amount of gold and silver was extracted from the mines of Mexico by the most crude and primitive modes and appliances, of which no better idea can be obtained than by contrasting their results with those produced by modern improvements. The miners of the Pacific slope have accomplished, *in thirty years*, two-thirds of what the miners of Mexico accomplished in 355 years, *i. e.*, since the conquest of Mexico by Cortez. There is no question as to the great number, extent, and richness of the mines of Mexico, and when they come to be worked by the improved machinery and appliances of to-day their yield will be proportionately greater.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING SEPTEMBER 23D, 1879.

219,912—AMALGAMATING PAN—Ezra Coleman, S. F.
219,913—MULLER FOR AMALGAMATING PANE—Ezra Coleman, S. F.
219,942—CARPENTER'S GAUGE—A. Helran, San Leandro.
219,985—BUNG—W. D. Scott, S. F.
219,998—ANIMAL TRAP—W. J. Taber Wyoming Ter.
219,837—PROPELLER FOR VESSELS—Geo. Vincent, Stockton, Cal.
7,691—BREAD-RISING PREPARATIONS—Trademark—B. F. Barton, S. F.
7,692—YEAST POWDER—Trademark—D. Callaghan, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

PROPELLER FOR VESSELS.—George Vincent, Stockton, Cal. No. 219,837. Dated Sept. 23d, 1879. This invention relates to certain improvements in the construction of propellers for vessels; and it consists in a novel formation of the blades, which are made of plates having a plain flat surface, standing at an angle with each other, and also with the line of the axis. The usual method of forming propellers is to make them with two, three or four blades, having the curve and pitch of a screw; but in this invention blades are employed which are in the form of flat plates, having no curve at all. These plates are fitted up to the hub, so as to stand in a plane, which crosses the axis at an oblique angle. This angle may be varied to suit the work for which the propeller is designed. The propelling force will be superior to that of a regular screw, for the reason that the blades, being perfectly plain instead of being curved in section, certain unfavorable conditions due to this curvilinear form are avoided, so that while the best effects of the screw are produced when the blades are made quite narrow, this propeller will produce its maximum effect when the blades are in the form of sections which occupy nearly or about one-half of the circle which they appear to produce when viewed in a line with the shaft, the outer ends of their enclosing radial lines being cut by the lines forming the obtuse angle.

ORE FURNACE.—George W. Reamer and Edward Anderson, Forest Hill, Placer county, Cal. No. 219,763. Dated September 16th, 1879. This invention relates to an improved furnace for roasting and desulphurizing ores, and it is more particularly intended for working the ores of mercury, the fumes of which are to be caught and conveyed to condensers. It is specially constructed to roast fine ores, which, in ordinary furnaces are apt to clog or liable to pack in such a manner that the fire has not free access to all the particles. It consists in constructing a central chamber between vertical walls, on the outer side of each of which is a fire-place, the drafts from the two fire-places passing in opposite directions and meeting in a common flue, where they join the fumes from the ore and pass to the condensers.

LATH SAWING MACHINE.—Josiah Black, Oakland, Cal. No. 219,678. Dated September 16th, 1879. This invention relates to that class of wood-sawing machinery such as is used for sawing out laths, and the improvements consist in providing a moving table, on which the saws are placed, while the log remains stationary, only feeding forward enough for a new cut of the saws. It also relates to a method of mounting the saws, so that some of them may be thrown out of action if desired, and to certain details of construction, whereby the feed of the log is accomplished automatically.

CARBURETER.—Mark P. Fleming, Oakland, Cal. No. 219,705. Dated September 16th, 1879. This device relates to an improved carbureter for enriching gas or air; and consists in certain details of construction for catching and discharging the water of condensation, and by means of which the gas or air is thoroughly saturated with the enriching hydrocarbon oils.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Gold Hill (I. T.), Sept. 24th, $27,834.86; Northern Belle, Sept. 22d, $4,442.72; Hillside, Sept. 26th, $6,000; Alexander, Sept. 25th, $7,162.11; Northern Belle, Sept. 24th, $4,528.96; Belle Isle, Sept. 28th, $14,700; Independence, Sept. 28th, $2,100; Hillside, Sept. 29th, $6,000; Bodie Con., Sept. 29th, $20,500; Martin White, Sept. 28th, $5,224.54,

A Library for Inventors.

We have at our patent offices, No. 202 Sansome street corner Pine, a complete set of Patent Office reports, containing engravings and claims of EVERY PATENT ever issued in the United States.

We have also a complete set of the MONTHLY VOLUMES issued by the Department, with full detailed description and large drawings of all the patents issued since the time when these volumes were first published.

A set of all the LAW BOOKS ON PATENTS is also on our shelves ready for reference. We have also the British Commissioners reports, Canadian Patent Office reports for all British North America, full files of MINING AND SCIENTIFIC PRESS, PACIFIC RURAL PRESS, *Scientific American*, *Scientific American* supplement, *American Artisan* and other American and foreign scientific and mechanical journals, as well as mechanical dictionaries, chemistries, encyclopedias, and other works of reference.

Inventors and patentees are WELCOME TO EXAMINE at their leisure any of the books in the above sets, and we shall be glad to give them any assistance in hunting up what they want.

Our library is the most complete of its kind on the Pacific Coast in every respect, and we are continually adding to it as occasion demands. DEWEY & CO.,

Patent Agents and Publishers,

No. 202 Sansome street, corner Pine, San Francisco

OUR AGENTS.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. L. THARP—San Francisco.
B. W. CROWELL—California.
A. C. KNOX—Pacific Coast.
S. V. BLAKESLEE—State of Nevada.
G. W. MCGREW.—Santa Clara county.
MILTON KENNEDY.—Kern and Inyo counties.
J. B. BACHELDER.—Shasta County, Cal.
H. H. MESSENDER—Arizona.

Back Numbers Wanted.

The following volumes and single copies of the MINING AND SCIENTIFIC PRESS are wanted at this office, for which a reasonable price is offered:

Year.	Volume.	
1870	20	2 Complete volumes, 1st half (of year).
1870	20	2 Copies of No. 2, Jan. 1st.
1870	20	1 Copy each of No. 1, Jan 1st, 3 of Jan. 14th, 7 Feb 11th, 0 Feb. 4th.
1870	21	1 Copy of No. 7, August 13th.
1871	22	5 Copies of No. 1, Jan. 7th.
1871	22	3 Copies of No. 5, Feb. 4th.
1871	22	1 Copy of No 3, Jan. 21st, 6 of Feb. 2d, and 1 of May 1st.
1871	23	1 Copy of No. 2, July 15th, and 9 Sept. 2d.
1872	24	2 Copies of No. 4, Jan. 27th.
1872	24	3 Copies of No. 7, Feb. 17th.
1872	24	2 Copies of No. 17, April 27th.
1872	25	1 Copy of No. 10.
1872	25	1 Complete volume, last half (of year).
1873	26	3 Copies of No. 8, Feb 22d.
1873	26	3 Copies of No. 9, March 1st.
1873	26	2 Copies of No. 10, March 8th.
1873	26	1 Copy of No. 7, Feb. 15th.
1873	27	3 Copies of No. 20, Nov. 15th.
1873	27	4 Copies of No. 21, Nov. 22d.
1873	27	3 Copies of No. 24, Dec. 13th.
1875	30	1 Copy of No. 4, Jan. 23rd.
1875	30	1 Copy of No. 5, Jan. 30th.
1875	30	1 Copy of No. 8, Feb. 20th.

Quicksilver Mining Publication.

Memoir on the Mines and Works of Almaden, by M. H Kuss, M. E. Translated from the "Annales des Mines" for the MINING AND SCIENTIFIC PRESS, by S. B. CHRISTY.

CONTENTS.—PART I.—Geological Description of the Deposits at Almaden: 1. Introduction; 2. Geological Situation and Coonstitution; Silurian System; Devonian System; Eruptive Rocks; 3. Deposits of Mercury; Description of the Mine; Mineralogical Constitution of the Vein Matter; Age of the Veins; Abandoned Mines PART II.—Exploitation of the Mines of Almaden: 1. Method of Exploitation; 2. Organization of Labor; 3. Mechanical Preparation. PART III.—Metallurgy of Mercury at Almaden: 1. Description of the Works; 2. Treatment of the Ore; 3. Losses of Treatment. PART IV.—Administration and History; 2. History; 48 large pamphlet pages, post-paid, 50 cents. DEWEY & CO., Publishers, S. F., 1879.

EVERY new subscriber who does not receive the paper, and every old subscriber not credited on the label, within two weeks after paying for this paper, should write personally to the publishers without delay, to secure proper credit. This is necessary to protect ourselves and subscribers against the acts and mistakes of others.

FRESH attractions are constantly added to **Woodward's Gardens**, among which is Prof. Oruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

HOW TO STOP THIS PAPER.—It is not a horculeau task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

READING, July 12th, 1879.

MESSRS. DEWEY & CO.—*Gentlemen:*—Have received my lettera patent for the bar roller to-day. I am very much obliged to you for your prompt service, and will recommend you to all who may want your assistance.

I remain yours, etc., OEO. MEDING.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

EXTRA COPIES can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

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Chew JACKSON'S BEST Sweet Navy Tobacco

GENERAL MERCHANDISE.

[WHOLESALE.]

WEDNESDAY M., October 1, 1879.

CANDLES.

Crystal Wax	17 @—
Eagle	12 @—
Pateot Sperm	30@—

CANNED GOODS.

Assorted Pie Fruits.	
2½ lb. cans	2 25 @ —
Table do	3 50 @ —
Jams and Jellies	3 75 @ —
Pickles, hf gal	3 25 @ —
Sardines, qr box	1 57½@1 90
Hf Boxes	2 50 @2 75
Merry, Faull & Co.'s.	
Preserved Beef.	
2 lb. doz	3 75 @4 00
do Beef, 4 lb. doz	5 50 @ —
Preserved Mutton.	
2 lb. doz	3 75 @ —
Beef Tongue	5 50 @ —
Preserved Ham.	
2 lb. dnz	6 50 @ —
Deviled Ham, 1 lb. doz	5 50 @ —
do Ham, ½lb doz	3 00 @ —
Boneless Pigs Feet.	
3 lbs	4 50 @ —
2 lbs	3 75 @ —
Spiced Fillets.	
2 lbs	4 25 @ —
Head Cheese.	
3 lbs	4 25 @ —

COAL—Jobbing.

Australian, ton	6 00 @ 5 50
Coos Bay	— @ 5 50
Bellingham Bay	@— —
Seattle	5 50 @ 8 00
Cumberland	12 00 @15 00
Mt Diablo	4 75 @ 6 00
Lehigh	11 50 @12 50
Liverpool	6 00 @ 5 50
West Hartley	— @ 8 00
Scotch	— @ 8 00
Scranton	— @— —
Vancouver Id	8 00 @— —
Charcoal, sack	75 @— —
Coke, bush	60 @— —

COFFEE.

Sandwich Id, lb.	— @— —
Costa Rica	18 @ 16½
Guatemala	18 @ 16½
Java	23 @— 26
Manila	17 @— —
Oreund, in ca	25 @— —

FISH.

Sac'to Dry Cod	— @ 4
do in cases	5 @ 5
Eastern Cod	— 7 @— 7½
Salmon, bbls	8 00 @ 9 00
Hf bbls	5 00 @ 5 50
¼ lb cans	1 10 @ 1 12½
Pkld Cod, hbls	22 00 @— —
Hf bbls	11 00 @— —
Mackerel, No. 1.	
Hf Bbls	9 50 @10 00
In Kits	1 85 @ 2 10
Ex Mess	3 25 @— —
Pkld Herring, bx	3 00 @ 3 50
Boston Smkd H'g	70 @— —

LIME, Etc.

Plaster, Golden Gate Mills	3 00 @ 3 25
Land Plaster, tn	10 00 @12 50
Lime, Sta Cruz, bbl	1 25 @ 1 50
Cement, Rosendale	2 00 @ 2 25
Portland	4 00 @ 4 50

NAILS.

Ass tod sizes, keg	2 70 @ 2 75

OILS.

Pacific Glue Co's	
Neatsfoot, No 1	1 00 @ 90
Castor, No 1	1 35 @ —
do, No. 2	1 30 @ —
Baker's A A	1 25 @1 30
Olive, Flagiol	5 25 @5 75
Possel	4 75 @5 25
Palm, lb	9 @ —
Linseed, Raw, bbl.	78 @ —
Boiled	80 @ —
Cocoanut	55 @ —
China nut, gal	— @ 65
Sperm	1 40 @ -
Coast Whales	— @ 32½
Polar	— @ 35
Lard	— @ 70
Oleophine	22 @ 22
Devoe's Bril't	17½@ 18½
Photolite	— @ —
Nonpariel	31 @ 32½
Eureka	18 @ 42½
Barrel kerosene	20 @ —
Downer Ker	35 @ —
Elaine	37½@ —

PAINTS.

Pure White Lead	8 @ 8½
Whiting	1½@ —
Putty	4 @ 5
Chalk	1½@ —
Paris White	2½@ —
Ochre	3½@ —
Venetian Red	3½@ —
Averill Mixed Paint, gal.	
White & tints	2 00 @2 40
Green, Blue & Ch Yellow	3 00 @3 50
Light Red	3 00 @3 50
Metallic Roof	1 30 @1 50

RICE.

China, Mixed, lb	4½@ 5
Hawaiian	5 @ —

SALT.

Cal. Bay, ton	15 00 @22 50
Common	10 00 @12 00
Carmen Id	12 00 @14 00
Liverpool fine	19 00 @— —

SOAP.

Castile, lb	8 @ 15
Common brands	4½@ 6
Fancy brands	7 @ 8

SPICES.

Cloves, lb	— @ 45
Cassia	19 @ 20
Nutmegs	85 @ 87½
Pepper Grain	— @ 12
Pimento	19 @ 20
Mustard, Cal., ½ lb glass	— @1 25

SUGAR, ETC.

Cal. Cubo, lb	— @ 10½
Powdered	— @ 10½
Fine crushed	— @ 10½
Granulated	— @ 10
Golden O	— @ 8½
Cal. Syrup, kgs	70 @ —
Hawaiian Mol'sses	26 @ 30

TEA.

Young Hyson, Moyune, etc	— @ 51
Country pckd Gunpowder & Imperial	— @ 42½
Hyson	30 @ 35
Fooo-Chow O	35 @ —
Japan, lat quality	40 @ —
2d quality	20 @ 2

METALS.

[WHOLESALE.]

WEDNESDAY M., October 1, 1879.

IRON.—	
American Pig, soft, ton	28 00 @35 00
Scotch Pig, ton	26 00 @30 00
American White Pig, ton	25 00 @— —
Oregon Pig, ton	28 00 @35 00
Refined Bar	4 @ 8
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 8
Norway, according to thickness	7 @ 8
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— 17
Drill	16 @ 17
Flat Bar	15 @ 19
Plow Steel	8 @ —
TIN PLATES.—	
10x14 I O Charcoal	8½@ 9
10x14 I C Coke	7 @ 7
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb. less than cask	9½@— 10
NAILS.—	
Assorted sizes	3 50@4 00

LUMBER.

WEDNESDAY M., October 1, 1879.

CARGO PRICES OF PUGET SOUND PINE

REDWOOD.		RETAIL PRICE.	
Rough, M	13 00	Rough, M	18 00
Refuse	9 00	Fencing	18 00
Clear	23 00	Flooring and Step	28 00
Clear Refuse	13 00	Narrow	30 00
Rustic	23 50	2d quality	25 00
Refuse	18 00	Laths	3 50
Surfaced	20 00	Purring, 1inch ft	—
Refuse	14 00	**REDWOOD.**	
Flooring	20 00	RETAIL PRICE.	
Refuse	12 00	Rough, M	18 00
Beaded Flooring	23 00	Refuse	14 00
Refuse	13 00	Pickets, Rough	15 00
Half-inch Siding	16 00	Pointed	16 00
Refuse	14 00	Fancy	22 50
Half-inch Surfaced	20 00	Siding	20 50
Refuse	14 00	Surfaced & Long Beaded	30 00
Half-inch Battens	16 00	Flooring	30 00
Pickets, Rough	11 00	Refuse	22 50
Rough, Pointed	12 50	Half-inch Surfaced	30 00
Fancy, Pointed	18 00	Rustic, No. 1	30 00
Shingles	1 75	Battens, lineal ft	—
		Shingles M	2 00

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending October 1, 1879.

HIGHEST AND LOWEST BAROMETER.

Sept. 24	Sept. 25	Sept. 26	Sept. 27	Sept. 28	Sept. 29	Sept. 30
29.992	30.035	29.977	29.938	29.930	29.887	30.031
29.924	29.038	29.013	29.906	29.894	29.830	29.878

MAXIMUM AND MINIMUM THERMOMETER.

65	64	65	65	67	68	63
57	56	57	58	57	55	54

MEAN DAILY HUMIDITY.

81.3	78.6	79.7	83.7	87	70.3	78.7

PREVAILING WIND.

W	W	W	W	W	W	SW

WIND—MILES TRAVELED.

128	186	221	244	337	265	227

STATE OF WEATHER.

Fair.	Cloudy	Fair.	Clear.	Fair.	Fair.	Fair.

RAINFALL IN TWENTY-FOUR HOURS.

Total rain during the season, from July 1, 1879. 0.03 in.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Butte Hydraulic Mining Company.—Location of Principal Place of Business, San Francisco, California. Location of Works, Butte County, Cal.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 1) levied on the 26th day of August, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
E. Poirson	13	2½	$25 00
A. O. Hawes	17	10	100 00
I. M. Scott	18	10	100 00
Wm. Labadie	19	5	50 00
J. G. Stout	21	2½	25 00
Louis Lapierre	22	2½	25 00
H. Marcoux	24	2½	25 00
John Britt	26	2½	25 00
J. H. Mooney	27	2½	25 00
Zotique Gervais	29	8	80 00
Zotique Gervais	30	1	10 00
Zotique Gervais	31	1	10 00
Geo. W. Deltzler	37	5	50 00
E. Chaquette	38	5	50 00
American M. and Dredging Co	40	5	50 00
N. Desautelle	41	2½	25 00
J. Lucier	42	2½	25 00
N. Goldtree	43	7½	75 00

And in accordance with law and an order of the Board of Directors made on the 26th day of August, 1879, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, room 20, No. 328 Montgomery street, San Francisco, California, on Tuesday, the 21st day of October, 1879, at the hour of 10 o'clock A. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

L. L. DENNERY, Secretary.

Office, room 20, No. 328 Montgomery street, San Francisco, California.

Gover Mining and Milling Company.—Location of principal place of business, San Francisco, California. Location of works, near Drytown, Amador County, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 30) levied on the sixth (8th) day of August, 1879, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Am't.
Ashby, Mark T, Trustee	907	1341	$670 50
Ashby, Mark T, Trustee	908	800	400 00
Ilrsyton, M L	847	400	200 00
Brayton, M L	901	115	57 50
Gorrie, Thomas	682	10	5 00
Pratt, Freeman	496	10	5 00
Prehle, Edward E	880	45	22 50
Knox, Joseph A	567	100	50 00
Knox, Joseph A	571	50	25 00
Knox, Joseph A	572	50	25 00
Knox, Joseph A	573	50	25 00
Knox, Joseph A	728	30	19 50
Skinner, E C	441	100	50 00
Skinner, E C	819	100	50 00
Skinner, E C	820	50	25 00

And in accordance with law and an order of the Board of Directors, made on the sixth (0th) day of August, 1870, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, room 8, No. 402 Front street, San Francisco, California, on Monday, the sixth (8th) day of October, 1879, at the hour of one (1) o'clock P. M. of such day, to pay delinquent assessments thereon, together with costs of advertising and expenses of the sale.

W. O. WILSON, Secretary.

Office, Room 8, No. 402 Front street, San Francisco, Cal

Annual Meeting.—Syndicate Mining Co., of Bodie, Mono County, California.

The annual meeting of the above named Company will be held at the office, Room 20, Hayward's Building, 419 California street, San Francisco, Cal., on Thursday, October 16th, 1879, at 1 o'clock P. M., for the purpose of electing a Board of Directors to serve for the ensuing year, and for the transaction of such other business as may properly come before the meeting. Also in accordance with a resolution adopted at a meeting of the Board of Directors, held September 15th, 1879, to take into consideration and decide upon the proposition to increase the capital stock of said Company, from Five Million Dollars divided into fifty thousand shares at the par value of one hundred dollars per share, the present capital of the Company, to Ten Million Dollars, to be divided into one hundred thousand shares of the par value of one hundred dollars each.

THOS. G. TAYLOR,
ROBT. N. ORAVES,
GEO. W. HOPKINS,
CHAS. H. FISH,
} Directors.

The transfer books will be closed October 8th, 1879, at 8 P. M. JACOB STADTFELD, JR., Secretary.

The Pacific Land and Trust Company.—Location of principal place of business and works, San Francisco and State of California.

Notice is hereby given that at a meeting of the Board of Directors held on the eighteenth day of September, 1879, an assessment (No. 1) of One Dollar and Twenty-five cents per share was levied upon the capital stock of said corporation, payable immediately to the Secretary at the office of the company, 513 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on Saturday, October twenty-eighth (28th), 1879 will be delinquent, and advertised for sale at public auction, and unless payment is made before will be sold on Saturday, November eighteenth (18th), 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale. WM. ANDREWS, JR., Secretary.

Office, 513 California street, San Francisco, Cal.

Dividend Notice.—Office of the Pioneer Mining Company, room 15, No. 310 Pine street, San Francisco, California, September 20th, 1870.

At a meeting of the Board of Directors held this day, a dividend (No. 1) of eight (8) cents per share was declared on the capital stock of the company, payable Monday, October 6th, 1879. Transfer books closed.

J. W. PEW, Secretary,

H. DEGROOT, SR. F. E. BIRGE. H. DEGROOT, JR.

DeGROOT, BIRGE & CO.,

Mining Engineers & Assayers,

Examination of and Reports on Mines a Specialty.

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THOMAS MAGUIRE.....Manager.
CHAS. H. GOODWIN.....Treasurer.
J. P. CHAPMAN.....Assistant Treasurer.

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CHAS. E. LOCKE.....Lessee and Manager

PYRAMUS AND THISBE.

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UNITED STATES

Mineral Land Laws, Revised Statutes

AND INSTRUCTIONS AND FORMS UNDER THE SAME.

We have just issued a pamphlet containing the General Mineral Land Laws of the United States, with instructions of the Commissioner of the Land Office. The contents of this pamphlet comprise all of the Government laws with relation to mineral lands of interest to the mining community, as follows: Mining Statute of May 10th, 1872, with Instructions by the Commissioner of the Land Office; Mining Statute of July 26th, 1866; Mining Statute of July 9th, 1870. Forms required under Mining Act of May 10th, 1872, as follows: Notice of Location; Request for Surveys; Application for Patent; Proof of Posting Notice and Diagram of the Claim; Proof that Plat and Notice remained Posted on Claim during Time of Publication; Registers' Certificate of Posting Notice for Sixty Days; Agreement of Publisher; Proof of Publication; Affidavit of $500 Improvements; Statement and Charge of Fees; Proof of Ownership and Possession in Case of Loss or absence of Mining Records; Affidavit of Citizenship; Certificate that no Suit is Pending; Power of Attorney; Protest and Adverse Claim; Non-Mineral Affidavit; Proof that no Known Veins Exist in a Placer Claim, etc. There is also given the U. S. Coal Land Law and Regulations thereunder. The work comprises thirty pages, and will be sold, postfree, for 50 cents. It should be in the hands of every one having any mining interests. DEWEY & CO.,

Publishers of the MINING AND SCIENTIFIC PRESS, S. F

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KUSTEL'S ROASTING OF GOLD AND SILVER ORES, and the extraction of their respective metals without quicksilver. Illustrated. 142 pages. 1870. A valuable and carefully written work. Postpaid, $2.50. Published and sold by Dewey & Co., S. F.

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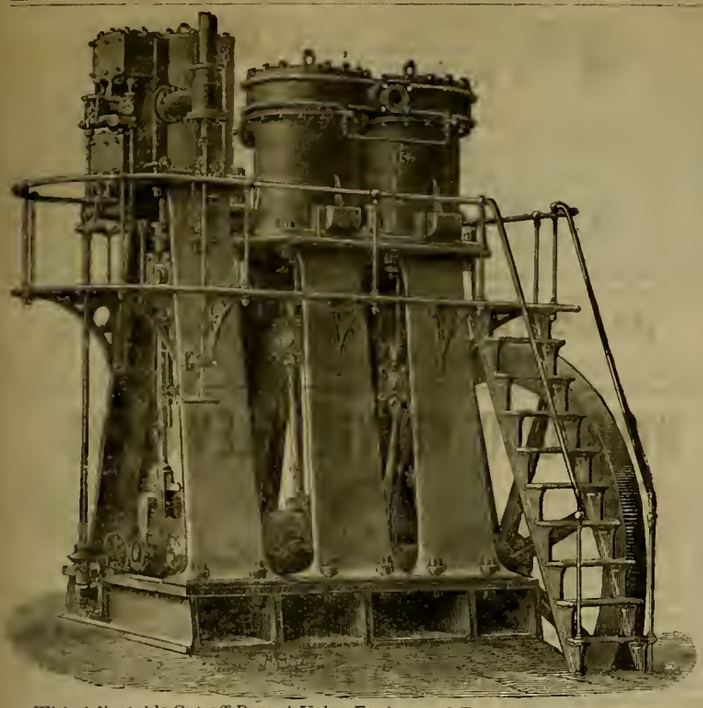

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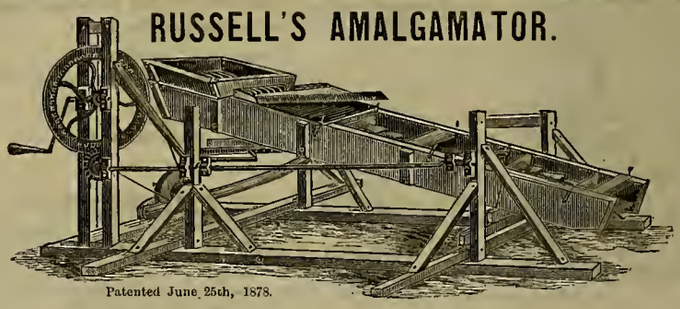

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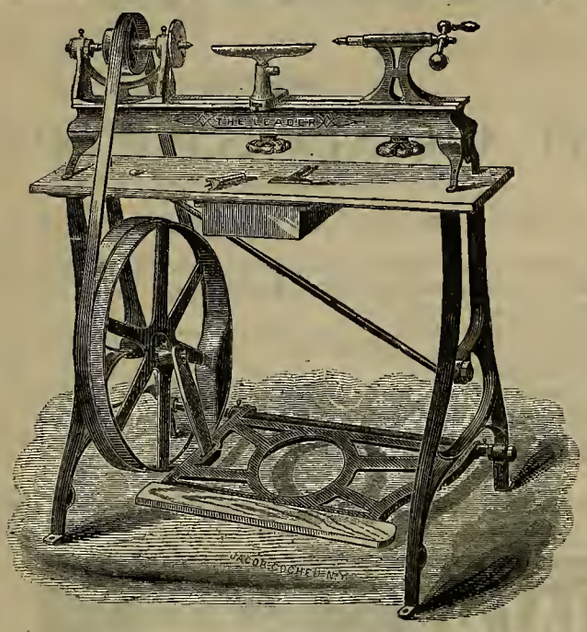

Material eighteen inches long and eight inches in diameter can be turned upon it. The pieces that accompany this Lathe without extra charge are two T rests, two plain centers, one spur center for wood turning, and one face plate.

Price of Lathe without Saw Attachment.....$45. Price of Lathe WITH SCROLL Saw Attachment.....$55
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Chuck for drills ½ and under, Price.....$1.50
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No. 1.—Equalling Liquid Nitro-Glycerine in Strength. We recommend this Grade in extremely hard rock, boulders, iron, etc.
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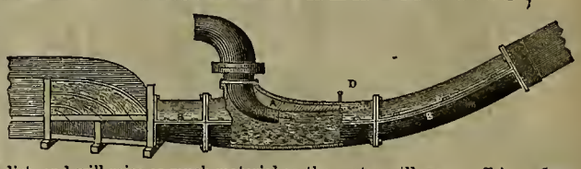

No bedrock cuts, tunnels or drains required. Machine a sufficient drain itself, and the process of mining the same as any other hydraulic mine. Is now a practical success in various places in California and Oregon. Send for descriptive circular to

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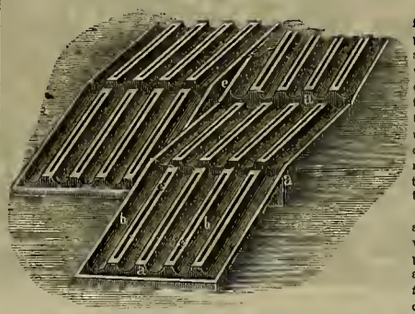
No. 51 Fremont Street, Office of the Hydraulic Gravel Elevating Mining Co., S. F

Howland's Under-current, Mill and Sluice Riffle.



This invention meets a want which has long been felt by Gravel Miners and Millmen, viz.: that of a simple, cheap Riffle which will save the largest possible amount of gold or sulphurets, with the least possible waste of quicksilver. That this Riffle answers all these conditions will be apparent to any practical man who takes the trouble to examine it. The arrangement of this Riffle is such that there is a strong, unobstructed upper-current to carry off and break up the gravel or cement, and a slow under-current, checked by numerous riffles, which give gold or sulphurets a better opportunity of settling than if they were exposed to the force of the main current.

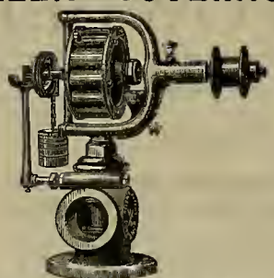
In this Riffle there are cast troughs for the quicksilver, which extend entirely across the sluice, and while they are so placed that the current will naturally pitch towards them, and give every opportunity for amalgamation, the quicksilver is fully protected from flouring or leakage. There is no mechanical skill required in taking out or replacing the sections.

Full particulars in regard to this invention can be obtained by applying to

STEIGER & KERR, of the Occidental Foundry, 137 First St., S. F.,

Who have the sole right of manufacturing this Riffle, and who will receive and attend to all orders.

ALLEN GOVERNOR.



This Governor is now being generally adopted throughout the United States and Europe. It is without doubt the

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Thus saving more than their cost every week in the month. Every Engine to which this Governor is attached will run with the throttle wide open. The speed of the Engine can be changed by a simple adjustment of the weights. It will give a UNIFORM SPEED WITHOUT REFERENCE TO THE BOILER PRESSURE. It is simple in construction and not liable to get out of order.

Every Governor warranted to give perfect satisfaction. Thirty days given for a trial, and if it does not fulfill all that is promised, it can be returned at our expense.

In ordering, state the kind of engine, diameter of cylinder, stroke, speed, and average pressure.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, OCTOBER 11, 1879.

VOLUME XXXIX Number 15.

Geology of the San Jose Mining Co.'s Mines.

The property of the San Jose mining company is at Egan canyon, White Pine county, Nevada, and consists of some seven consecutive mines on the ledge, aggregating 7,015 feet, and 6,000 feet more of other mines in the northwest and northeast. Egan canyon is in Gold Canyon district, about 90 miles south of Wells' station, on the C. P. R. R. Near the creek in the canyon is the company's 20-stamp mill, with an engine sufficiently powerful to drive 40 stamp. The company was organized in 1871, and more or less work has been done on the different mines since then; but great difficulty was met with in the water, and a tunnel had to be run to draw it off. General Rosecrans was the engineer in charge for some time, and is now President of the company. The other trustees are W. H. McCormick, A. Carrigan, M. J. O'Connor and T. H. O'Connor.

A report made by Prof. J. E. Clayton on this property is interesting, as showing the geology of this section of country. We condense as follows from his report:

The geological formation is composed exclusively of the oldest stratified rocks, in alternate zones of schist, quartzite and slate, aggregating a thickness from east to west of about 10,000 feet, including the entire series of beds between the Azoic and Paleozoic formations.

The upheaval of the beds has been from the east towards the west, and their upturned edges form the entire east face and summit of the Egan range. The west flank of the range and the high ridges west of the Egan basin are made up of the silurian, devonian and carboniferous beds, consisting mainly of calcareous shales and limestones peculiar to those geological ages.

The section and diagram annexed, give from east to west across the range the order of occurrence of these geological formations.

The strike of the beds, or strata of the country rock, is nearly N—S; dip of the beds towards the west, at angles from 40 to 80 degrees.

The quartzite is hard, vitreous and fissile, in parts much broken and crushed by geological disturbances. The slates are tough, usually fine texture, finely laminated, with fracture lines oblique across the stratification, giving it a jointed appearance. The Gilligan lode cuts obliquely across the country rock, from S. W. to N. E., and the dip is N. W. at angles varying from 50 to 80 degrees below the horizon, the average dip being about 70 degrees. The lode varies greatly in thickness between its walls as well as in its mineral contents.

Where it passes through zones of slate, the vein gangue is made up of fragments of slate and clay, resulting from the abrasion or grinding of the walls during the period of disturbance immediately preceding the mineralization of the lode. In some places the fissure is filled with this ground-up clay and slate, to the exclusion of quartz and ore. Where the lode passes through the zones of quartzite the walls are rougher, but still well defined. The fissure is more free from the debris of the walls, the vein usually larger and better filled with true quartz gangue and larger quantities of good ore.

The obvious result of this alternating of slate and quartzite is to divide the lode into pay chutes, or chimneys, and pinches or barren spaces between them. The evidence is seen in the "pitch" of the ore chutes to the west, conformably with the dip of the country rock. Hence we may expect to find the largest and most productive ore chutes where the walls of the lode are quartzite, and more pinched and unproductive where it passes through slate belts.

Taken as a whole, the Gilligan lode is a good example of the "true fissure" lode, of great length and undoubted persistence in depth. It is not a large vein, neither is it likely to become such in depth. It will probably enlarge and contract alternately towards the deep, as we know it does on its horizontal course.

The large adit is well situated for the convenient exploitation of the lode, and is indispensable as a drain level and roadway into the mine. The work has been well planned and executed up to the intersection of the lode. Levels have been driven to the right and left on the course of the lode. The level to the right or N. E. extends some 600 or 700 feet, following the vein part way through slatey, pinchy ground 200 or 300 feet, then a series of cross courses and broken ground was encountered, making it somewhat difficult to distinguish the lode from the cross courses that cut the lode obliquely from S. S. W. to N. N. E. The dip of the cross courses or breaks is to the S. E., thus crossing the lode obliquely both on the longitudinal and vertical lines. At the last of these faults the level left the lode and followed the line of fault some 20 feet or more, then turned to the right upon the general course of the lode, but in the hanging wall country north of it.

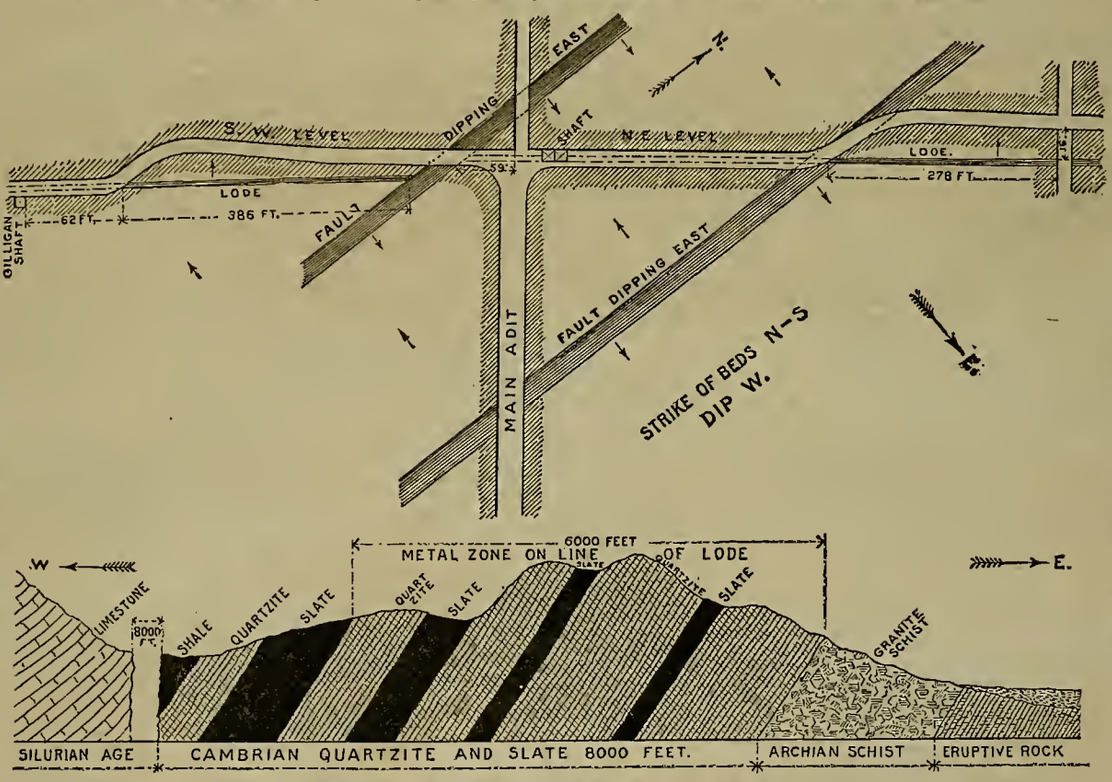
The level S. W., towards the old Gilligan shaft, followed the vein 52 feet, then a wide cross course was encountered (having a course and dip parallel with those above described) that carries the vein a few feet south of its true course. The level, being continued on its course, missed the lode, and was driven in the hanging wall country a distance of 386 feet. The latter portion of this distance the level has curved to the south, cutting the lode 62 feet from the old Gilligan shaft. This of course has only exposed the lode 114 feet in a distance of about 500 feet. * * * The lode is, in all probability, richer in the precious metals *below* the permanent water-line than it is above it, owing to the well-known tendency of silver sulphurets to oxidize and become soluble. If *chlorine* be present in sufficient quantity, the soluble sulphate of silver becomes "fixed" as an insoluble chloride; but if chlorine is not present, the silver would be leached out by the surface waters and lost. Even if chlorine were present, it would not combine with the silver unless the mechanical conditions were favorable. For example, if the country rock were close like granite or porphyry, the water would stand in the lode at rest, except perhaps a slow movement down the line of fissure. In such case a very small quantity of chlorine would be sufficient to change the sulphate to a chloride of silver. No such conditions are to be found in your mine.

The country rock is hard, metamorphic sandstone (quartzite) and slate, very brittle and fissile, allowing the surface waters to pass through rapidly, thus diluting the solutions beyond the precipitating point, or carrying them away mechanically by the rapid movement of the waters.

The drainage line has been governed to a great extent *by the grade of the canyon*. There has been a time when the water-level was far above the present line. In the meantime the canyon has been plowed out from the edge of the valley back into the mountain, making a series of cascades over obstructing reefs. As these became broken down by the vast floods accompanying the geological disturbances at the close of the tertiary age, accompanied by crashing earthquake shocks, we can readily see that many sudden changes of water level occurred: 1st, by wearing down the canyon bed; and, 2d, an earthquake shock, breaking the strata, and loosening all the joints and seams in the country rock, thus suddenly shifting the drainage-line some hundred feet lower and leaving a corresponding zone of the lods undisturbed by the underground water flow.

If the foregoing statement of facts and suggestions are correct, it readily explains why rich blocks of ground in the ore chutes were found near the surface, and why the same ore chutes were impoverished near the present water line.

From a careful study of the facts and conditions present at various times in the geological history of your mines, I am strongly impressed with the correctness of the theory of the impoverishment of the ore chute near the water line and that the average richness of the lode is greater below the horizon of moving waters than it is above it.



GEOLOGY OF MINES IN EGAN CANYON, NEVADA.

The most notable instances supporting this view that I have studied are: 1st, the Atlanta lode in Altura district, Idaho; and 2d, the mines in Butte district, Montana.

In these two localities the fact of impoverishment by the action of the surface waters and atmospheric oxidation are unmistakable; and I can find no mechanical, chemical or other physical cause to prevent a like result in your mines. At any rate, if this is not the true solution of the facts and phenomena found in the Gilligan lode, I must confess my inability to solve the problem.

Notwithstanding my strong conviction that the lode is generally richer below the zone of surface drainage, I think the work of sinking to the deep should be deferred until after the lode above the drain level has been thoroughly explored and its paying ores made available. You must economize in the general business management, and devise more economical and efficient methods of ore reduction. Everything in the lode above the drain level that carries ten dollars per ton should be extracted and worked with a margin of profit.

New Zealand Gold Fields.—Late advices from New Zealand, per Thames *Advertiser*, indicate an improvement in the mines. The water is rapidly lowering by the working of the Big Pump. The result of a fortnight's run in the Moanataiari mine, with 20 head of stampers on 270 tons of quartz was 322 ounces of melted gold. Selected quartz from the old Welcome section of the Welcome extended yielded nearly six ounces of gold per ton. The result of 115 tons of quartz from the Kuranni Hill United was 745 ounces 11 pennyweights of gold.

The valleys, through which passes the rail road from Vera Cruz to the city of Mexico, are from 3 to 30 miles wide, bounded by steep mountains. Every part of this region is now under a high state of cultivation, and artificially irrigated in the best manner.

It is probable that Mexico will oppose De Lesseps' Panama canal scheme.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

The Mines of Pioneer District, Arizona.

EDITORS PRESS:—There are in this district, one of the most noted in Arizona, two distinct, but adjacent formations, in which the silver-bearing veine are found. Of these the easterly one was the firet to attract general attention and claim to some extent the confidence of Nevada prospectors and experts, as its characteristics are eimilar to many of the most favored districts of that State. The country rock is gneiss, and the strike of strata northerly and southerly. The veins are generally of fair size and good definition, and the ores, though more encumbered with base metals, may be likened to those found about Austin, in the Reese River country.

Tbe extent of this formation is not, and probably never will be, known, as its southern extremity finds its way heneath the overlying basalt, which, it appears, at one time covered the surface of this part of the territory for many miles in extent, and it is only at points where it has been broken down and carried away, exposing the country beneath it, that any metal-bearing veins are found at all. Its extension northerly remains to be determined by the prospector, but we know that for a distance of eeveral miles north from the noted Silver King, which lies close to the *pecache* or basaltic bluff to the "Surprise mine," which has yielded considerable fine ore, that the country is thickly laced with veins of more or less value. Of these the "Alice Bell," and one or two others, are showing good faces of ore—not because they were any better from the start than many others in the same section, but because they have been handled with some degree of energy and perseverance. These mines require a little means to open them in good shape, but they are mostly located and held in idleness by impecunious persons at figures which moneyed men very properly decline to pay.

The Silver King.

Although it has been stated that the mines of this locality are usually well-defined, this bonanza chief of the district ie an exception to the rule, and has given rise to much discussion as to its probable course and permanence. Were it known to be a true fissure vein, a great impetus would be given to the prospecting of others belonging to the same formation, and its condition and peculiarities are therefore matters of public interest. The prospecting that has been done thus far in the immediate vicinity of the Silver King encourages the belief that, though quite extensive, it is only an isolated deposit and not a continuous vein of ore. Shafts sunk both in the North and the South Silver King, on the line of stratification of the gneiss, developed only a few thin and insignificant strata of ore. The owners, however, are sinking a new working shaft, which would indicate that they, at least, have confidence in the pay chute continuing in some direction.

Lying west and touching the gneiss formation above mentioned is one of limestone likewise found to contain much silver in veins not so well defined. The denudation of the basaltic rock has here been such as to expose a large belt of limestone averaging two miles in width and of indefinite length, and still affording opportunities for such prospectors as do not require a brand new district, and are willing to work with perseverance. The veins on this belt have several characteristics which render them especially interesting to scientific miners, and somewhat of a puzzle to experts, some of whom look upon them with enthusiastic favor, and others turning away in disgust pronounce them a fraud. The truth is no doubt between these extremes. The veins crop out only at points where they are capped with the black oxide of manganese which appears to resist the action of the elements. These croppings have commonly been mistaken for hematite, an oxide of iron which they somewhat resemble. In places where this hard cap is wanting, the ores sometimes appear at the surface or are only covered by a few inches of loose drift; and referring to such spots, a newspaper correspondent some time since stated it could be kicked out of the ground anywhere. The enormous disproportion between the price of shoe leather and the amount of ore so obtained, has prevented the adoption of the "kicking" process, yet it is a fact that on many of the locations, enough fine ore is found on the surface to place them beyond the necessity of eoliciting capital to aid in their development—a very fortunate circumstance for the prospector.

It is admitted as a rule that ores found in limestone lie in pockets and hunches, and this is not claimed as an exception; but where these deposits are large and frequent, and always connected by leadere of gangue, mining for them may prove quite as profitable as though the ore bodies were continuous but narrower or of lower grade. To find large quantities of paying ore is the problem in mining, and it makes but little difference what shape it lies in.

The fact that this belt abounde in fine specimene, and the tendency of interested parties to select only each for assay, has given rise to the erroneous helief that its ores are wonderfully rich. The eooner such an impression is discarded the hetter, as it will not do on which to found any practical and successful operations. This limestone formation has never produced more than five or eix tons of ore that would average over $300, and none in quantity assaying above $500 per ton, though it is not uncommon to find specimens which run well up in the thousands. The district can never look to fancy grade ores for euccess, and might hetter come down at once to eober facts and the consideration $75 ore which is a very close approximation to the average value of that which can he produced in large quantities, enough at any rate to warrant the investment of capital and satisfy any reasonable expectation of profit. Thie assertion is not based on the hypothesis that the veins will be permaneut, hut is made on the strength of surface deposits already in sight. Their permanence is a question still shrouded in doubt, as no deep prospecting has yet been done but by theories and observations, too complex and numeroue here to elucidate, the writer is led to the opinion that at a depth of several hundred feet they will assume more regular and definite shape.

Picket Post, Septemher 20th, 1879.

Working Gravel Mines at Smartsville.

EDITORS PRESS:—The mines at Smartsville carry considerable quantities of black sand of high grade, an assay by Messrs. Frederick & Soderling, of Bodie, having indicated $822.67 per ton, gold, including a small percentage of silver and 61-100 of 1% of platinum. The platinum appears in minute white particles, being generally very fine. The miners there knew that it it ie neither gold nor quicksilver, and that is about all they appear to know about it. I fear, however, that the quantity is not sufficiently large to prove of much benefit to Edison in advancing the electric light business. Up to this time hut very little of the black sand has been saved, the miners generally being in too great a hurry to bother with these small matters, consequently much gold has doubtless heen lost. These sands can only be saved in any considerable quantity by appropriate machinery. Several devices purporting to effect this purpose have been brought hefore the public. Miners should, therefore, investigate them, and if practical, give them a trial.

One great difficulty that has heretofore stood in the way of the erection of appropriate machinery was the lack of water suitable for motive power, the general impression appearing to have been that the muddy water as it flowed from mines could only he utilized for an overshot or some similar wheel. The cost of these wheels was such as to generally deter people from their use, and especially as but few sites would admit of their erection without a considerable expenditure for excavating or blasting.

Water from the mines, for motive power, on small wheels, may be made practical by means of a sand-settler, about 6 feet deep, 6 feet broad, and 12 feet long, the muddy water being made to answer an excellent purpose for driving small wheels by means of a chute, under pressure of a head of 20 feet or more. The mouth of the chute, or trunk, should he made of cast metal (preferably white metal, hy reason of its great hardness), the wear from the grit left in the water being mostly on the chute. The sand should he drawn off at the bottom by means of two cast iron chutes about 3 inches square, having metal on 3 sides, the upper sides heing open for the working of small gatee. It is hest to have two chutes for the discharge of the sand, as in case one should become stopped with a etone or some similar substance, one would still be open. The water intended for motive purposes should flow out at the top, and thence be conducted into a penstock, from whence it is discharged at the bottom.

My wheel at Gold Run is 5 feet in diameter, chute 2x4 inches, head of water 22 feet, discharging about 25 inches of water. The wheel was of my own get up, combining, to a considerahle extent, the turbine principle, and gives splendid power. It ran nearly constantly, day and night, for about four months the past season in propelling my agitating device, and there was but very little wear of the chute or wheel. After the buckets become too much worn, which would probably not occur sooner than after 12 months of constant use, tbey can be very easily replaced with new ones.

The construction of a wheel similar to the foregoing, if there are good facilities, will cost, including irons, about $32. It is, therefore, far cheaper and more practical than either an overshot or hreast wheel for propelling any machinery that may be necessary to he erected in hydraulic mines for the purposes aforesaid.

I should have observed that, in order that the water for motive power may be as free from sand and stones ae posible, it should he taken out near the top of the flume, and at a point sufficiently high above to give the desired fall at the place of erection. If there is but little fall in the vicinity, it will he necessary to take water some dietance above in order that the desired fall may he gained. Thus, most flumes are built on a grade of from eix to eight inches in 12 feet. The small sluice-box need not, at the outside, have a grade of more tban two inches in 12 feet, and particularly if some of my concentrator irons, or other appropriate means, he used soon after the water is discharged from the flume into the small sluice-hox for the purpose of freeing the water from sand. You thus gain from four to six inches in every 12 feet, and would not have to proceed very far hefore the small sluice-hox would he sufficiently high above the flume to give the desired pressure.

As regards sulphurets, I will state that any practical device that will take hlack sand will also take them and other suhetances of valne.

BRYAN TYSON.

Lake District, Mono County.

EDITORS PRESS:—The mines of Lake district are steadily gaining ground. Mammoth, the principal mine opened, have heen building their mill of 40 stamps for the last three montbs, which is now completed and running steadily. Soon a steady flow of bullion will he the result. I examined, with Superintendent Hardy, the mine, and found everything in order. This mine is being steadily developed, with great improvements in their ore vein as they go south. Their mill will require 100 tons per day, which is easily extracted. This property is under the care of Col. Wm. Hardy, a man that means business, and is placing everything in first-class order. McClellan, the foreman, understands his business fully, and is the right man in the right place. The officers of the company are our most energetic men, well known in San Francisco. Thie mine is now entering on a new era, and is now worked and run in a very economical manner, and soon will be placed among our dividend mines. Work is being pushed on True Blue mine, and soon their vein will be opened hy tunnel at a depth of 400 feet vertical. This company meane hnsiness, and have bought 80 acres of land at foot of mountain to place their mills upon, and soon another mill will be added to the number. This mine has a large amount of ore on croppings, which shows assays from $20 to $1,000 per ton. I have seen no such croppings outside of Comstock mines, and they resemble them much. Ores are free milling. Don Quixote, adjoining True Blue, are also running tunnels, and will cut vein about the same depth as True Blue. This company bas a fine property, which soon will he opened. Their ore is of a high grade; their vein will average 15 feet all pay ore. Headlight is doing nothing at present, hut have joined Monte Christo in running tunnel, which will cut vein 600 feet vertical. Monte Christo is sinking shaft now 160 feet; their vein carries free gold, which runs into silver as depth is obtained. This vein is 13 feet wide, with good walls and shows a true fissure.

Another very rich mino has just been opened on the south end of belt called the Metallic Con. Free gold can be seen in the rock. The vein is about six feet wide, and is all pay; quartz is of a fine quality. Further developmente will place this mine in a prominent position.

Lake View mining company, Judge Heydenfeldt, President, has a fine property, and lies on west side or slope of Mineral hill. The company own four mines in their incorporation. The ore is mostly silver. The North Star is their main location, and the eecond location in the district. Their croppings are immense, and if developed at depth this company would have an abundance of ore. They bave a fine mill site and privilege at hase of mountain, with wood and water in the greatest abundance. This company has a bright future.

There are other mines in this district tbat are hriskly at work running tunnels and shafts to open up their veins in a prominent manner, and soon the mines of Lake district will be better known. The mines are permanent and lasting, and will soon employ thousands of miners. The future outlook of this district is indeed great.

A. CALDWELL.

Mammoth City, Cal., Sept. 26th.

MINING UNDER-CURRENT ON BEAR RIVER.—The Grass Valley *Union* says Wm. H. Kinder, of Gold Run, Placer county, has nearly completed an extensive "under-current" on Bear river, at a point a short distance below the Crandall road crossing, for the purpose of washing the mining tailings that flow down the hed of the stream and extracting the fine gold therefrom. To effect this a substantial dam has been built across the river, which is high enough to give the tailings a fall into the sluices and under-current which are placed on the east bank of the river above flood mark. The eluices will carry off the heavier tailings while the fine particles will drop through the interstices of the sluices into the under-current, which has a broad surface of riffles and is charged with quicksilver. A mining arrangement of this character is to a great extent self-operating, and the under-currents are generally cleaned up hut once or twice a year. This is the first under-current placed on Bear river to collect the fine gold that is known or believed to be carried into the stream from the hydraulic mining operations carried on in the neighboring districts on each side of the river. This plan has been tried successfully in other districts on a smaller scale, and it is thought that it will he found profitable when applied to Bear river, as it will take the washings of all the claims that are running tailings into it. The cost of the works will be about $7,000.

Recent Discovery in Tuolumne County.

On Septemher 27th, says the *Independent*, Wells, Fargo & Co. shipped from Sonora several hundred pounds of gold hars, the product of a mining claim in town. All kinds of rumors were afloat as to weight and value, some stories going as high as 600 pounds, and $90,000 in value. The truth, however, in this instance, is more startling than rumor. The amount shipped, as the express receipt shows (as exhihited to a friend of ours by one of the lucky parties), is $189,000, and the weight 820 pounds. Some $50,000 was shipped at different times, not long since, and about $26,000 previously, making a grand total taken out, that is known, of some $265,000, or over a quarter of a million dollars, inside of seven months. The claim is located on Gold hill, in Sonora, at the head of Washington street, a few yards west of the Episcopal church, the tunnel heing on a level with the street. Charles Clarke, Joseph Bray and James G. Divoll are the partners, the two former only working in the claim, with no other assistance. This hill has been celebrated for the amount taken out in early days, and has heen repeatedly prospected for years since by parties who hoped to find another bonanza. The gulches running from it have also heen fabulously rich—especially the run south, crossing the old Condit lot (since mined out with big results) and continning down through the center of Washington street. Several companies have, at different times, proposed to tunnel down the length of this street, hut it was never done, as no arrangement could he made with the city. In '66, Ike Potter, our County Clerk, and two others sank a shaft 40 feet deep and run a tunnel under Rodgers' house, in hopes to strike the vein. They etruck an old tunnel and a big excavation, which looked so shaky that they became disgusted and abandoned the chase. Mr. Dan. Longeway, and otbers, also worked here for the same object, but failed to find the right spot. It remained for the latter parties, named above, to he more fortunete. These gentlemen have had much experience in quartz mining, and believing they could find a honanza, started in some months since, and now have a big reward for their faith and well directed labor. They are very reticent about details, and it is difficult to get at all the facts the public would like to know. The quartz yielding the last shipment of $189,000 was taken out hy two of the parties, inside of a week, about two months ago, and they have since heen engeged in pounding it out in mortars and running it into bars—the tunnel in the meantime heing fastened by an iron gate and heavy locke; no admission given to anyone. The hullion is very fine, and will coin near $20 per ounce at the Mint. Sheriff Yencey and Assessor Monahan went down with the stege as a guard, and no one outside knew anything about the matter until a day or two after. They were instructed not to stop at Copperopolis, but to go on until they struck the up Milton stage. It was necessary, however, to stop at Copperopolis to hrace up the stage, as the immense weight stored in the iron safe under the center seat cansed the stage to sag in the middle.

To the Pole in Balloons.

The determination to arrive at the North Pole and solve that mysterious portion of the earth's surface which has heretofore refused to he explored, has now taken the shape of an expedition in halloons, on the plan recommended hy Commander Cheyne, R. N. The expedition is to go by ship as far north as possible, and then take flight in aerial means of conveyance from winter quarters during the first week in June.

The average temperature in the early part of June is about 25° Fah. The balloons are named Enterprise, Resolute and Discovery; each will he capable of lifting a ton in weight, the thres carrying a sledge party intact, with stores and provisions for 51 days. The ascent will be made on a curve of a roughly ascertained wind circle, a continuation of which curve will carry them to the Pole; hut should the said curve deflect, then the required current of air can again he struck by rising to the requisite altitude, es proved by experimente that different currents of air exist according to altitude; this fact Commander Cheyne himself ohserved when, in charge of the government balloons in his last expedition, he sent up four at the same moment to different altitudes; being differently weighted, they took four different directions to the four quartere of the compass, giving him his first practical idea of ballooning in the Arctic regions. Captaiu Temple's experiments with the war halloons from Woolwich Arsenal have fully confirmed thie important desideratum in aerostation.

About 30 hours would suffice to float our aeronauts from the ehip to the Pole, should all go well.

Condensed gas would he taken in steel cylinders, hills would be floated over hy expansion and contraction of the balloons, and in the event of any accident occurring, we alwaye have our sledge party, with sledge, boat, etores and provisions for 50 days, intact and ready for service. Scotland has taken up this novelty in Arctic exploration with avidity, and England, though more cautioue in the matter, has at last given her adhesion to the project being carried out. Canada is likely to join, and Commander Cheyne has received an invitation from the Canadian Minister of Finance, Sir Samuel Tilly, K. C. B., to deliver his lectures in Canada, witb the promiee of a warm reception.

MECHANICAL PROGRESS.

The Flexible Shaft.

Although great strides have been made during the past 10 years in all kinds of machinery, the expert recognizes most of them as extensions and developments of known ideas and methods. The principles involved in the flexible shaft are, however, radically different from the principles involved in other machinery. The different stages of its growth towards perfection were so unobserved by the world at large, that when exhibited at the Centennial exhibition, it excited the greatest astonishment of every hobbler. Almost all machinery is characterized by fixity in certain planes of motion. The whole value of a turning lathe consists in the maintenance of its centers in a true line, and in all reciprocating machine tools, the moving portions of the mechanism are confined to fixed lines and planes. But here is a device which sets at naught the transmission of rotary motion through straight lines, and conveys it through curves varied at the will of the operator. It upsets all our ideas of rigidity. The first "flexible shaft" was a simple coil of wire, used as a universal joint in sheep-shearing machines, dental and a limited number of light power machines. Flexibility was obtained at a great sacrifice of strength, and the coil therefore made inconveniently large.

Where primitive motion was desirable the angle of torsion was too great, to correct which defect a coil of wire was wound on a center of flexible material. This was an improvement, but only to the extent of the resistance to compression offered by the filling material. The next step was an important one and consisted in two concentric coils, wound in opposite directions, instead of a single coil. By this arrangement the tendency of the outer coil to contract is met by an equal effort of the inner coil to *expand*. Flexibility was lost, however, since it required more effort to bend two coils than one. It could not be used on any but light power machines on account of its liability to kink or twist out of line, and double up into twisted loops. The shaft, too, when running at a high rate of speed, vibrated in a very curious manner, dividing into equi-distant nodes like the string of a musical instrument, and thus interfering with the proper functions of the working tool, giving it a tremulous motion impossible to control. The defects were finally overcome by enclosing the revolving shaft in a flexible *stationary* sheath or case, and at the same time the carrying power of the shaft itself was increased by making it solid all the way through, in the sense that wire rope is solid, the sheath enabling an indefinite number of bearings to be given the revolving core, preventing all tendency to kink or vibrate. As now constructed the flexible shaft is made up of a *core*, a *case* and appropriate fittings by which the two are joined, rotary motion communicated at one end of the shaft and delivered at the other.

The core is composed of a series of concentric steel wire coils wound hard on each other, the direction of the pitch changing with each layer. The pitch direction of the outside layer is always such that the latter will tend to contract under strain, the shaft always running one way. The case is made of a hollow coil of square wire, with a slight groove on the outer side. This coil is covered with leather, which is prevented from slipping by the groove in the wire. The inside diameter of the case is slightly larger than that of the core, and the ends are furnished with iron ferrules, to receive the driving-pulley and the hand-piece carrying the working tool.

The flexible shaft is not a special tool for a particular purpose, but a connecting link between a given power source and a multitude of tools, and its uses are very varied. It is used in light operations as well as heavier ones, particularly metal drilling. By means of a pair of idler pulleys, mounted one over the other in a weighted frame, and secondly of a pair of pulleys in a swivel frame attached to a hanger adjoining the counter-shaft, the shaft and its drill may be carried at will to any part of the shop.

It reaches into remote corners, and is applied to manifold applications, from drilling, polishing, horse and cattle brushing, morocco finishing, even to boot blacking. A correspondent of the London *Times*, speaking of this shaft, says: "Pharaoh himself could not have been more surprised at seeing Moses' rod turn to a serpent than we were to see this rope-like affair eating into the planks set on all sides for it to work upon."

TESTING MACHINES FOR FABRICS.—The custom of testing iron, wood, and other building materials, and testing wire, ropes, cables, etc., and using these tests as a measure of the commercial value of the materials, has proved to be so advantageous that the same idea is being applied to woven fabrics of all kinds. For testing the strength of fabrics, a new machine has been introduced, designed to report pulling strains from half a kilo. up to 250 kilos. The machine consists of an upright standard, supporting a horizontal hollow beam of iron, containing scale levers with a brass weighing scale having a sliding weight and a graduated scale. Suspended from the weighing apparatus is a clamp lined with leather, and so arranged that when the end of the piece of fabric to be tested is clamped between the jaws the strains will be evenly balanced and distributed. Below this, on the base of the machine, is a roller controlled by a hand-wheel, and round this the other end of the fabric is wrapped, when, on turning the wheel, the strains are applied, and by moving the weight on this scale-beam, so as to keep it continually balanced, a point is reached where the fabric is torn apart. This point shows the breaking strain of the material. The percentage of stretching before breaking may also be found in the same manner. If all fabrics were tested in such a machine, and the breaking point carefully noted and marked on the goods when offered for sale, data would be provided which would place the money value of the goods on an exact basis.—*Scribner for October.*

OSCILLATING AND PORTABLE MELTING FURNACE.—Mr. A. Piat, a prominent founder and machinist in France, has devised an oscillating and portable melting furnace, which is designed to obviate the many inconveniences attending a stationary crucible furnace. The furnace proper is a boiler-iron case, lined with refractory material, and made square so as to save coke; the fuel mostly lodging in the corners and the pot nearly touching the sides. A strong iron band surrounds the case at such a hight that it may tip and balance nicely when the pot is about full of metal. By means of the trunnions the furnace is lifted and carried about; levers or carrying bars being employed when carried by men, and a crane used for the larger sizes. In some of the large furnaces, the device is tipped only, and seldom carried out of place, the metal being run into an ordinary ladle. The refractory lining is of best firebrick, or of well-tamped fettling. The furnace is slightly conical below. On the front side is a spout, and at the back a large square opening for the escape of the gases of combustion. The cover is that ordinarily used in foundries. The crucible, which must be fixed therein steadily and permanently, is supported by a "cheese" or flat cylindrical block of refractory material resting on the grate. The spout in front, and a wedge, also of refractory stuff, placed at the back of the pot, hold the whole firm. After the first heat or so these pieces become a unit with the pot. The whole affair rests on two brick supports and receives a blast pipe below if blast is used. The grate is cleaned every two or three heats by slicing from below, tipping the furnace for that purpose. R. Grimshaw, in the *Journal of Franklin Institute*, says this furnace is a great improvement upon the wasteful manner of mounting and using crucibles for melting and pouring steel, brass, etc., which have been in vogue for a hundred years without change. The furnace reduces the consumption of heat to a minimum, and time and fuel in rebedding the pot in the coke for the next melting, as well as avoiding all danger of accident from breakage.

BLAST-FURNACE APPARATUS.—In carrying out the improvements of Mr. Thomas Hollis, of Ilkeston, it is proposed to employ a tymp to each open forepart furnace, such tymp with the filling plates and wedges, which secure it in position, is of the width of the open forepart. The central part of the outer side of the tymp projects, and forms a trough over which the cinder passes as it escapes through an orifice in the center of the tymp. In the construction of the tymp and trough there are three or more elongated inlet coils of pipes of a suitable size, the coil nearest the outside of the furnace projects into the body of the trough, and is returned into the tymp, where it is returned upwards, and is connected to three or more return coils of pipe lying over the inlet coils. Round the whole of these pipes the metal forming the tymp and trough is cast, the orifice in the center of the tymp lying between the inlet and outlet coils. By this means he saves considerable time and expense in working the furnace and renewing the fettling, as the tymp and trough is protected from the effects of the heat of the furnace by water circulating through the coils of pipes.—*London Mining Journal.*

IMPROVED ORE STAMP.—J. J. Wait, of Oreana, has invented a new ore stamp, for which he has applied for a patent. The improvements consist of a hollow stamp stem, in combination with a guide rod, making the construction of the stamp cheaper and the stamp less liable to get out of order than those now in use in quartz crushing batteries. The inventor also claims that the stamp can be run with less power than the old stamp, and that any of the stamps in the battery can be taken out and repaired without interfering with the others. The tappets are so constructed that it is impossible for them to slip. The wooden guides, which mill men have long regarded as a nuisance, are dispensed with altogether, and only one bolt has to be removed to take out a stamp stem. A model of a battery with the new stamps is being exhibited there by the inventor. It is a very ingenious piece of mechanism and mill men who have examined it pronounce it far superior to the stamp now in use.—*Nevada Silver State.*

NEW TELEGRAPH APPARATUS.—Prof. Klinkerfues, the director of the Observatory at Gottingen, has patented a new telegraphic invention by which it is said to be possible to send as many as eight messages simultaneously along the same wire. A portion of the invention is an apparatus which simultaneously writes down all the messages as they arrive at the station to which they are addressed.

SCIENTIFIC PROGRESS.

A New Law of Metals.

At the meeting of the American Institute of Mining Engineers held at Montreal last month, Prof. Egleston read a paper on "A New Law of Metals," which he has discovered by a long continued and important series of experiments on the fatigue of metals.

The so-called fatigue of metals arises from two causes: 1, cold rolling, which produces a cold flow of metals; 2, shocks, either few, heavy and sudden, or many, slight and frequent. The breaks resulting from these causes indicate that the metals undergo not only a physical, but a chemical change. Some of the physical changes have been noted. The fact that a chemical change takes place has not been noticed heretofore. The speaker noticed that blows on metals produced a change in the color of the metals. Certain letters were punched in steel, and, upon etching, they showed white. The same phenomenon was exhibited in metals that had been cold rolled. The fact of fatigue has been frequently noticed, but that it follows laws, and that rupture is both a physical and chemical phenomenon, is new. The question arises, How can these fatigued metals, rendered useless, be restored? There are two ways: first, by rest; second, by heat. This phenomenon, which the speaker called the law of refreshment, is, so far as he knows, a new one. It is constant, and in nearly all metals. The Professor announced that he was constructing a machine with which to study the law. The only exception to this law of fatigue by shock is in the case of tin, which becomes brittle by rest, though tin can be restored by a very low heat. In answer to a question, Prof. Egleston stated that the chemical change consisted in a change in the condition of the carbon.

The discussion which followed Prof. Egleston's announcement of this law was interesting. Prof. Silliman gave some instances of the operation of the law of fatigue in the case of grapevine iron and brass wire hung in coils in the laboratory. In answer to a question of Dr. Sterry Hunt, he gave some account of the effect of heat in changing the character of a certain alloy of tin, copper and antimony, which, when first cast, was crystalline and resonant, but lost these characteristics in rolling. The resonance was restored upon heating by plunging into an oil bath of high density. This fact has been largely used in the arts, notably by the Meriden Britannia Company. Dr. Hunt mentioned the well-known fact regarding old Spanish coins that seemed worn entirely smooth, but which were restored so as to bring out the device upon heating. Dr. Raymond suggested that the law was one of alloys, not of metals, and pointed out the similarity of the phenomena described by Prof. Egleston to those witnessed about a blast furnace in pig iron. Prof. Egleston replied that, in the sense Dr. Raymond used the word, all metals were alloys. Mr. Holley asked if Prof. Egleston had examined steel rails that had been cold-straightened as to the gag marks. Prof. Egleston answered that he had, and that they showed the gag mark every time. Mr. Holley stated that the effect of the use of the gag in cold-straightening on the steel rail was a most important question. At Krupp's works there is a fine of about $1.25 for the appearance of gag marks on rails. The most prominent engineers in Europe connected with steel works are searching for some method of straightening rails hot that will do away with this effect from the gag.

VEGETABLE IVORY PLANT.—The *Colonies and India* furnish some interesting particulars respecting the so-called "vegetable ivory" which is now so much used as a substitute for ivory. The vegetable ivory used is the produce of a species of palm found wild in South America and Africa. Inside the hard shell is the white kernel, which, being softer than ivory and easily carved, as well as readily dyed, and being less brittle than bone, is largely used in making buttons, etc. The unripe fruit consists of a green shell, containing a watery fluid, which, as the nut ripens, gradually thickens until it becomes a pulpy mass, and eventually hardens into solid matter. The water, though bitter to the taste, is wholesome, and often renders invaluable service to travelers who cannot otherwise obtain water to drink. The tree on which the fruit grows is unlike an ordinary palm, having little or no stem, and drooping downwards, especially when the branches are over-weighted with the six or seven bunches of nuts, each containing six or seven seed, enclosed in thick, heavy shells and outer sheath, and weighing altogether from 20 to 24 pounds.

INTELLIGENCE OF ANTS.—Sir John Lubbock, in studying the habits and instincts of ants with a view to determine their means of recognizing their fellows, says he took pupæ from a nest and divided them, giving part to the nest of a neighbor of the same species and part to the nest of a stranger of the same species. When grown the returned of the pupæ from the neighbor were all welcomed. The returned from the stranger were none welcomed, all being attacked and driven. Sir John says that there must be some reason why 100,000 ants in the same nest, who cannot possibly know one another as individuals, are never at war, while should a stranger approach he is at once slain. He concludes that they recognize each other by some smell or other sense quite unknown to us.

The Sensitive Plant Under Anæsthetics.

The idea of subjecting this remarkable plant to the action of anæsthetics was natural, and several experiments of the kind are recorded, the plant having been placed in vapors of ether or chloroform. Recently, M. Arloing has made some interesting observations of the effects of chloral, chloroform and ether presented for absorption by the roots. The pots were sprinkled with aqueous solutions of these substances, then covered with care to prevent escape of the vapors. After absorption of chloroform or ether, one notes primary and secondary effects; the former are phenomena of excitation similar to those arising from mechanical irritation, and comparable to those in animals when anæsthetized. They occur successively from the bottom to the top of the stem. In 30 to 60 minutes the common petioles (or leaf stems) straighten, and the leaflets separate, beginning from the top of the stem; but the plant is now found to have lost its sensibility. The secondary effects consist of elimination of the anæsthetic. The sensibility often does not return for one and one-half or two hours. Chloral does not act anæsthetically on the sensitive plant. These observations afforded M. Arloing an opportunity of ascertaining the velocity of liquids in the stem and branches of plants under strictly physiological conditions, whereas, past experiments on the subject have been made with withered or mutilated plants. If the leaves are in a good state the common petioles bend down suddenly and successively from below upward in the plant as the absorbed chloroform reaches them. Hence, knowing the dimensions of the plant, the velocity of the chloroformized water in the stem and primary petioles can be easily calculated. Within the stem the velocity is modified by the state of the tissues and foliage, the temperature, etc.; it was found in different cases at the rate of 0.90 meters, 2.22m., 2.40m., 2.76m. per hour. The velocity increases from the base to the top of the stem in the ratio of 1 to 1.25 or 1.50, and it is 1½ times to twice as great in the petioles as in the stem. The time of absorption by the roots was found to vary from 2 to 6½ minutes.—*London Times.*

HUMID REDUCTION OF METALS.—An improved mode of operating in the separation of lead, zinc, silver or copper in mixed ores or metallic mixtures has been patented by Mr. F. Maxwell Lyte, of the Scientific Club, Savile-row. The invention relates to the application of a methodical, alternate and continuous system of treatment of ores or metallic compounds by means of acid, wherein by a convenient disposition of the vessels and a special order of decantations the same acid is caused to pass successively over a series of two or more batches of ore, thus becoming completely saturated with the zinc and copper the said ore may contain, and becoming consequently as neutral as possible. Thus while the utmost possible economy of acid is obtained the least possible quantities of lead or iron are carried over in solution with the zinc or copper (the said lead and silver and most of the iron remaining behind with the gangue), so that the lead and silver which have become converted into chlorides can be readily taken up with boiling brine and precipitated together as usual with metallic zinc. He so arranges the attacking vats in which the ore is treated with the acid as to be able to decant the liquids from one of these to any other, and he so ordains the order of the decantations, the withdrawal of the saturated liquors, and the additions of fresh acid, that each time a batch of saturated zinc or zinc and copper chlorides is withdrawn from one end of the series a fresh batch of the acid can be added at the other end.—*London Mining Journal.*

A NEW ALLOY.—An alloy of peculiar beauty and adaptation, as a substitute for silver, is now employed in one of the most celebrated jewelry manufactories in France. It consists of 65 parts of iron, 23 of nickel, 4 of tungsten, 5 of aluminum, and 5 of copper. The iron and tungsten are melted together and then granulated, the water into which the mixture is run for this purpose containing one kilogram of slaked lime and one of carbonate of potash per cubic meter. The nickel, copper and aluminum are also melted together and granulated by running into water containing the same proportions of lime and potash—care being taken during the melting to cover the metals contained in the two crucibles with a flux composed of one part of boric acid to one of nitrate of potash or niter. In the crucible containing the aluminum and copper is placed a lump of sodium of about two grains in weight when treating five kilograms of the three metals—nickel, copper and aluminum—together, to prevent oxidation of the aluminum, and charcoal is also added to prevent oxidation of the copper. The granulated metals are dried, then melted together in the same crucible in the proportions above indicated, and well stirred, after which the alloy is run into ingots. It has the same appearance as pure silver.

MASTODON IN AMADOR COUNTY.—Portions of the fossil remains of a *mastodon giganteus* are frequently plowed up on the ranch of Frank McMurry, in Jackson valley. We have what appears to have been part of a huge tooth. It is a pity that some scientific man does not make a thorough examination of the locality, as the alluvial bottom land of Jackson valley was no doubt the stamping ground of antediluvian animals, compared with which the elephant is only a dwarf.—*Amador Times.*

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Sept. 18		Week Ending Sept. 25		Week Ending Oct. 2.		Week Ending Oct. 9.	
Alpha	29	19¾	20¼	17½	17¾	14½	17¾	16
Alta	6¾	6¼	6⅜	6	6	5⅜	5⅜	5
Andes	1.05	1	1.60	1.05	1.20	95c	1.20	1.05
Alps	....	....	....	....	....	....	....	....
Argenta	75c	70c	1.10	75c	1.60	90c	85c	75c
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	20c	....	20c	....	....	....	....	....
Baltimore Con	60c	50c	....	....	....	....	....	....
Belcher	4¾	4.40	4.60	4½	4¾	3.60	3.85	3.65
Belmont	55c	....	60c	....	65c	60c	65c	50c
Best & Belcher	18¾	17½	19⅝	17¾	18⅜	17½	17½	16⅝
Bullion	8¾	7⅞	8	7⅛	8⅞	7⅛	10	8
Bechtel	1.45	1.20	1½	1.40	1¼	1	1.15	1
Belle Isle	4.45	4.15	5¼	4¾	5⅜	4.85	4.95	4.05
Bodie	14½	11	14½	13¾	14	13½	13½	10½
Benton	4	3.60	3¾	3½	3.40	2¾	3	2.85
Bulwer	10½	8¾	12½	11¾	12	11¾	11¼	11
Boyle	....	....	....	....	....	....	....	....
Black Hawk	1	85c	1	80c	1	75c	1.10	75c
Belvidere	1	80c	90c	80c	85c	80c	1¾	80c
Booker	1.35	1.05	1¼	1.05	1	95c	80c	55c
Caledonia	2.10	1.70	2¼	1¾	2⅝	2	2.40	2.15
California	5	4.65	6½	5¼	5½	5¼	5⅝	5¼
Challenge	2.60	2.25	2.30	....	2.30	2.10	2¼	2.10
Chollar	7¾	6⅝	7¼	6¾	7¼	6⅝	7	6⅝
Confidence	11¼	10	10¾	10⅜	10¾	9	10	9
Con Imperial	2	1.30	1½	1.45	1.35	1.20	1.30	1.20
Con Virginia	4.95	4¾	6½	5¼	5½	5¼	5⅝	5¼
Crown Point	3.95	3.70	3.70	3¼	4.30	3⅝	4.20	4
Con Washoe	....	....	....	....	....	....	....	....
Champion	30c	25c	30c	20c	40c	30c	30c	25c
Concordia	....	....	5c	....	20c	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	50c	20c	60c	45c	1½	55c	1.30	1.10
Eureka Con	29	17¾	25¼	21	26	22¾	25½	24½
Exchequer	7⅝	5⅝	6⅝	5¾	6½	5	6¼	5¼
Endowment	35c	30c	50c	40c	55c	35c	50c	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	2.90	2½	2½	2	2.55	2	2.10	2
Gila	50c	40c	35c	30c	25c	15c	25c	20c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	8	....	....	....	13	12	13	....
Goodshaw	40c	....	35c	25c	40c	25c	30c	20c
Gould & Curry	12½	11½	12	11¼	11⅞	9⅝	10¼	9¼
Hale & Norcross	14⅝	13⅝	14½	13¼	13⅜	11⅝	12¾	11¾
Hillside	2	1.80	2	1.85	1.85	1½	2	1¾
Highbridge	....	....	....	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	5c	....	5c	....	15c	....	15c	10c
Independence	2.15	2.05	2.10	1.80	2	1½	1¾	1.55
Julia	4¾	4.20	4.55	4.10	4½	3¾	4.05	3.80
Justice	4¾	3½	4	3.55	3¾	3.20	3.30	3.05
Jackson	....	....	4½	4	3.90	....	4½	4
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	1	....
Kentuck	4.40	4.20	4½	4¼	4.30	4.20	4.15	4
Kossuth	10c	....	....	....	....	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	55c	40c	1.10	45c	1	70c	1	75c
Lady Wash	1¼	1	1.20	1	1.05	99c	1	85c
Leopard	25c	20c	60c	10c	60c	55c	60c	....
Leviathan	60c	50c	60c	60c	60c	45c	60c	50c
Leeds	50c	....	75c	....	65c	....	60c	....
Lee	....	....	....	....	....	....	....	....
May Belle	25c	....	25c	....	....	....	....	....
Modoc	....	....	1½	1	1½	1.20	1	....
Manhattan	3.40	2¾	3¼	....	3	....	2¾	2¼
Martin White	1.80	1½	3¼	2	2	1.90	2	1½
McClinton	60c	55c	80c	50c	65c	60c	65c	60c
Meadow Valley	....	....	50c	....	5c	....	5c	....
Mexican	39¾	36½	38¾	37	37	31	32¾	31¼
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	3	....
North Con Virginia	8	....	8⅝	8½	9	8	9½	8
New York	70c	60c	65c	60c	60c	45c	55c	40c
Northern Belle	4	3½	4	3¾	3.95	3¾	3¾	3½
New Coso	....	....	....	....	....	....	....	....
Navajo	50c	30c	40c	30c	40c	30c	50c	35c
Occidental	2.05	1.70	5¼	2.60	3¼	2.10	2¾	2.30
Ophir	42¼	39¼	44	42	43⅜	36	36½	33
Oriental	45c	10c	20c	15c	15c	....	15c	10c
Overman	10	8½	9½	9	9¾	8⅞	9½	9
Panther	....	....	....	....	....	....	....	....
Phenix	3	2½	....	....	....	....	....	....
Phil Sheridan	50c	30c	40c	....	40c	....	25c	20c
Potosi	6½	5½	6	5⅝	6	5¼	6¼	5⅝
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	75c	65c	1½	95c	1¼	1.10	1¼	1.10
Richer	40c	25c	....	....	....	....	....	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	15	13⅜	14¾	13¾	14⅛	12	12⅞	11¾
Seg Belcher	23	20	24	22	22	....	....	....
Sierra Nevada	48	45	48¾	46¾	49	42¾	49¼	47
Silver Hill	1.80	1.60	1.65	1.40	1½	1¼	1½	1¼
Silver King	....	....	4¾	4½	6	5¾	6	5
Silver Prize	....	....	....	....	....	....	....	....
Succor	10c	5c	5c	....	....	....	....	....
Summit	1.70	1½	2	1½	1¾	1½	1½	1¼
Scorpion	3	2.80	4	2.95	3.80	3.10	3.60	3.30
Solid Silver	25c	....	65c	25c	50c	30c	30c	....
South Bodie	30c	20c	30c	25c	25c	20c	25c	20c
South Standard	10c	5c	5c	....	10c	5c	....	....
Star	50c	45c	80c	70c	75c	50c	70c	60c
St. Louis	....	....	40c	....	....	....	30c	....
Syndicate	6	5¼	5⅞	5¼	5½	5	5	....
Tioga Con	3	2⅞	3.70	3	3.05	2⅞	2⅞	2.60
Tiptop	85c	80c	1.05	1	1¼	1.10	1.20	1.10
Trojan	40c	35c	25c	20c	30c	20c	20c	15c
Union Con	75½	69½	74	70½	72½	61	67¾	64
Utah	20½	18½	20¾	19½	20½	17½	20¾	19½
Vermont Con	....	....	....	....	....	....	....	....
Ward	2.60	2.35	3.10	30c	3½	2.90	3	2.70
Wells-Fargo	10c	5c	10c	....	5c	....	....	....
Woodville	45c	35c	40c	35c	....	....	40c	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	18	16½	16⅞	16¼	16½	15	16	15

Sales at S. F. Stock Exchange.

Friday A. M., Oct. 3.
220 Alta....5¼@5⅜
190 Andes....1.10@1.05
15 Benton....3
790 Bullion....8¼@8
110 Belcher....3.70
70 Best & Belcher....17½
630 Con Imperial....1.30@1¼
20 Confidence....9¼
180 Crown Point....4
155 Con Virginia....5¼@5⅜
125 Chollar....6⅜
480 California....5⅜@5¼
450 C Dorado....1.90
150 Caledonia....2.15@2.20
50 Challenge....2.20
200 Dardanelles....50c
345 Exchequer....5⅜
125 Flowery....70@65c
60 Gould & Curry....10¼
1500 Golden Gate....3
10 Hale & Nor....12½
180 Julia....4.05
430 Justice....3.30@3.20
455 Lady Bryan....90c@1
200 Leviathan....60c
140 Lady Wash....1
100 Mackey....1
240 Mexican....32½@32¾
50 Morning Star....3
10 North Con Vir....9
100 New York....40c
250 N Bonanza....1.40@1.30
225 Ophir....36@36½
130 Overman....9¼
250 Potosi....6@5⅝
20 Phil Sheridan....25c
375 Plutus....2.05@2¼
200 Savage....12@12⅛
420 Sierra Nevada....47½@47
350 Silver Hill....1.40@1.45
245 Scorpion....3.40@3½
300 Trojan....20c
215 Utah....20@19½
390 Union Con....64½@65¼
220 Ward....3@2.95
25 Woodville....40c
80 Yellow Jacket...15⅝@15¾

AFTERNOON SESSION.
300 Argenta....85c
900 Albion....20@25c
350 Boston....1½@1.40
750 B Chief....65c
120 Black Hawk....80@75c
200 Belvidere....95c
20 Bulwer....11⅛
250 Booker....65c
150 Belmont....65c
555 Belle Isle....4.95@4.85
470 Bechtel....1.15@1
90 Bodie....12@12½
850 Big Prize....35c
100 Champion....30c
700 Crœsus....20c
100 Caledonia (B H)....2½
20 C Pacific....7½
325 Day....1⅛@1.20
145 Dudley....1
90 Eureka Con....24½
100 Endowment....50c
500 Esmeralda....10c
600 Gila....25@20c
475 Grand Prize....2@2.10
200 Goodshaw....30c
280 Independence....1.60@1¾
325 Jupiter....1.05@1
200 K K Con....1
100 Leeds....60c
445 Mono....5¼@5
210 Martin White...1¾@1.65
1050 Metallic....70@75c
160 Mammoth....6½
200 McClinton....65c
80 Mt Diablo....6
300 Navajo....40c
2625 N Belle Is....35@30c
600 N Noonday....2
600 Oriental....15c
600 Orient....10c
305 Paradise....1¾
310 Ray'd & Ely....1½
10 Real del Monte....2½
70 S Bulwer....50c
20 Syndicate....5

170 Summit....1¼
100 S Bodie....25c
1000 Silver King....5
200 Star....65c
100 Tuscarora....20c
100 Tiptop....1.20
315 Tioga Con....2.60@2⅜
50 Wales....17

Saturday A. M., Oct. 4.
50 Alpha....16½
25 Alta....5⅜@5½
25 Andes....1.05
260 Argenta....75c
650 Albion....25c
55 Best & Belcher....17½
325 Bullion....8⅛
165 Belcher....3¾@3.85
10 Benton....3
915 Belle Isle....4.85@4.90
50 Bulwer....11½
330 Bodie....11½@11¼
50 Bechtel....1.15
210 Belvidere....80c
75 Black Hawk....80@75c
470 Booker....80c
100 Boston....1.40
90 Con Virginia....5¼@5⅜
20 California....5¼
230 Crown Point....4.10
870 Con Imperial....1¼@1.30
10 Confidence....9½
30 Challenge....2.20
265 Caledonia....2.40
50 C Pacific....7½
100 Crœsus....20c
300 Champion....30c
100 Caledonia (B H)....2¼
1020 Day....1.30@1¼
530 Exchequer....5½@5⅝
25 Eureka Con....24½
125 Flowery....65@60c
30 Gould & Curry....10½@10
800 Golden Gate....3
200 Gila....25c
50 H & Norcross....11½
20 Hillside....1½
320 Independence....1.65@1½
200 Julia....3.90@4
270 Justice....3¼@3.10
50 Kentuck....4.15
200 Leviathan....60c
110 Lady Wash....95c@1
230 Mexican....32¾
25 Mackey....1
100 Mount View....2½
1255 Metallic....80@75c
100 Mt Diablo....6
400 McClinton....65c
130 Mono....5
60 Mammoth....6½
350 M White....1.60@1½
10 N Con Vir....8
300 New York....50@55c
160 Northern Belle....3½
250 Navajo....35c
500 N Noonday....2
4300 N Belle Is....35@30c
195 Ophir....36@36½
10 Overman....9½
85 Occidental....2½@2.30
640 Orient....10@15c
100 Potosi....5¾@5⅝
25 Phil Sheridan....20c
300 Raymond & Ely 1.10@1.15
150 Real del Monte....2
10 Savage....12½
70 Sierra Nevada....47½@48
60 Silver Hill....1½@1.45
80 Scorpion....3.40@3.30
300 Star....60@70c
250 S Bulwer....50c
120 Summit....1½
230 Silver King....5⅝
125 Tuscarora....25@40c
620 Tioga....2.60@2¾
160 Union Con....64½@65
30 Utah....20
990 Ward....2.80@2.85
40 Wales....17½
55 Yellow Jacket...15¾@15½

Monday A. M., Oct. 6.
110 Alta....5⅜@5¼
240 Andes....1.05@1.10
30 Alpha....16
105 Belcher....3¾@3.80
110 Best & Belcher....17
195 Benton....2.90
770 Bullion....8¼@8⅛
1020 Con Imperial....1.20@1¼
135 Crown Point....4@4.10
80 C Dorado....2
45 Chollar....6⅞@6¾
15 California....5¼
185 Con Virginia....5¼
110 Caledonia....2¼
150 Dardanelles....50c
140 Exchequer....5½
340 Flowery....60@50c
120 Gould & Curry....9⅞@9¾
1250 Golden Gate....2¾@3½
95 Hale & Nor....11⅞@11¾
210 Julia....3.95@3.85
230 Justice....3.05
100 Lady Bryan....80c
95 Lady Wash....95c
500 Mexican....32¾@32½
30 Mackey....1
50 Morning Star....3
650 New York....55@50c
400 N Bonanza....1.40@1.45
10 Overman....9
510 Ophir....36½@35¾
70 Occidental....2¾@2.60
270 Potosi....5⅝
20 Savage....12@12½
150 Scorpion....3.60@3½
730 Sierra Nevada...49½@48½
500 Trojan....15c
460 Union Con....64@64¾
135 Utah....20½@20¾
510 Ward....2.80
20 Yellow Jacket....15¼

AFTERNOON SESSION.
100 Albion....20c
100 Boston....1.40
310 Bulwer....11⅛@11¼
200 Black Hawk....1.10
310 Booker....65@55c
500 Big Prize....35c
295 Bodie....10½
120 Bechtel....1.05
405 Belle Isle....4.20@4.05
100 Belmont....60c
60 Crœsus....20c
30 C Pacific....7⅛
250 Dudley....80c@1
2845 Day....1⅛@1.20
45 Eureka Con....24¾@25
400 Grand Prize....2
800 Gila....25c
650 Goodshaw....20@25c
630 Independence .1.55@1.65
420 Jupiter....1
670 M White....2
60 Mammoth....6¼
100 Meadow Valley....5c
150 Mt Diablo....6
10 Mono....5¾
10 McClinton....65c
455 Metallic....85@75c
45 Northern Belle....3.65
55 Noonday....2¾@3
610 N Noonday....2@2¼
1600 N Belle Is....30@35c
100 Navajo....35c
1000 Oriental....10c
200 Orient....10c
200 Paradise....1¾
240 Raymond & E....1¼@1.20
100 Silvor King....6
400 Star....65c
50 S Bulwer....40c
125 Summit....1.40
375 Tioga Con....2.65@2¾
450 Tiptop....1.10
50 Tuscarora....20c
20 Wales....16½

Tuesday A. M., Oct. 7.
155 Alpba....16½
235 Alta....5⅛@5¼
495 Andes....1.05@@1.10
45 Best & Belcher....17@16¾
430 Bullion....8⅜@8½
115 Belcher....3.70@3.65
335 Benton....2.60@2.65
175 California....5¼@5⅜
150 Con Virginia....5⅜
45 Chollar....6⅝
50 Crown Point....4.05@4
1275 Con Imperial....1.20@1¼
60 Confidence....9
275 Caledonia....2.30@2¼
600 Exchequer....5¼@5⅝
230 Flowery....60c
120 Gould & Curry....9⅝
1500 Golden Gate....2@2¼
250 H & Norcross....12@11¾
350 Justice....3.10
240 Julia....3.90@3.85
260 L Bryan....75c
155 Leviathan....60@55c
330 Lady Wash....95@85c
480 Mexican....31½@31¾
35 Mackey....1
100 Mt View....2.40@2½
120 New York....50c
30 North Con Vir....9½
355 N Bonanza....1.40@1.30
1015 Ophir....33@33½
65 Overman....9
655 Potosi....5⅝
655 Savage....12@11¾
585 Sierra Nevada....49@48¾
275 Scorpion....3.40
85 Solid Silver....30c
130 Silver Hill....1½
200 Trojan....20c
165 Utah....20@19¾
285 Union Con....65@64¾
125 Ward....2.70
10 Yellow Jacket.... .15

AFTERNOON SESSION.
100 Argenta....75c
300 Albion....15c
400 Addenda....50c
40 Bechtel....1.05
100 Belmont....50c
1230 Belle Isle....4¾@4.20
25 Bulwer....11⅛
100 Black Hawk....1
130 Belvidere....1¾
700 Booker....75c
695 Bodie....12½@13¼
100 Boston....1.40
50 Champion....25c
100 Crœsus....15@20c
160 C Pacific....7@6¾
50 Caledonia (B H)....2¼
1085 Day....1.20@1.10
50 Dudley....95c
200 D Standard....20c
130 Eureka Con....25¼@25½
405 Grand Prize....2@2.10
400 Goodshaw....25c
25 Golden Terra....13
1000 Hussey....10c
490 Hillside....2
150 Independence..1.65@1.60
25 Jackson....4
95 Jupiter....1
200 Meadow Valley....5c
80 Manhattan....2¾
200 Metallic....80c
50 Mt Diablo....5⅞
80 McClinton....60@65c
110 Mono....6⅜
100 Mammoth....6¼
190 Martin White.1.90@1.85
200 Northern Belle....3½
100 N Belle Is....25c
600 Navajo....40c
600 Noonday....2.90
740 N Noonday....2½@2¼
550 Oriental....15@10c
250 Orient....35c
508 Queen Bee....25c
200 Raymond & Ely....1.20
45 Real del Monte....2½
115 Summit....1¼
20 S Bodie....20c
100 S Bulwer....40c
100 Tuscarora....40c
630 Tioga....2.60@2.70
75 Tiptop....1.10
200 University....25c
30 Wales....17¼

Wed'sday A. M., Oct. 8.
200 Alpha....17½@17¾
70 Alta....5¼
340 Andes....1.10@1.20
1510 Bullion....10@9¾
10 Benton....2.85
70 Belcher....3¾
300 Best & Belcher...17½@17¼
415 California....5⅝
60 Con Virginia....5¼
25 Chollar....7
55 Confidence....10@9¾
1165 Con Imperial....1.30@1¼
120 Crown Point....4.20
300 Con Dorado....1.85
25 Challenge....2¼
130 Caledonia....2.20
390 Exchequer....6¼
350 Flowery....65@60c
100 Fairfax....90c
2220 Golden Gate....3@3¼
405 Gould & Curry....10
485 Hale & Nor....12⅜@12½
45 Julia....4.05@4
70 Justice....3.20
215 Lady Bryan....85@80c
50 Leviathan....55c
2020 Lady Wash....85@90c
90 Mountain View..2½@2.40
210 Mexican....31¾@31½
185 Mackey....95c@1
25 North Con Vir....9½
195 N Bonanza....1½@1.45
220 Occidental....2½
370 Ophir....33½@33¼
70 Overman....9
410 Potosi....6¼
150 Plutus....2¼
480 Silver Hill....1½@1.45
260 Savage....12⅜@12⅞
225 Scorpion....3.40@3.45
530 Sierra Nevada....49@49¼
500 Trojan....20c
355 Union Con....67@67½
60 Utah....20
450 Ward....2.90
175 Yellow Jacket....16@15⅞

AFTERNOON SESSION.
50 Argenta....75c
200 Albion....15c
480 Adenda....50@40c
50 Boston....1.40
50 Belvidere....85c
50 Black Hawk....90c
50 Booker....75c
115 Bodie....12⅜@12¾
975 Belle Isle....4.55@4½
260 Bechtel....1.10
30 Bulwer....11⅛@11
400 Champion....25@30c
100 Crœsus....20c
220 C Pacific....7@7¼
150 Caledonia (B H)....2¼
1170 Day....1.15@1.20
650 Dudley....1
150 Goodshaw....25c
150 Grand Prize....2
100 Hussey....15c
190 Hillside....1.95@1⅞
600 Independence....1.65
480 Jupiter....1
75 Jacksou....4½
30 Leopard....60c
50 Leeds....60c
50 Meadow Valley....5c
150 Martin White....1.65@1¾
160 Mammoth....6¼
230 Mono....6½@6⅜
20 Modoc....1
350 McClinton....60c
110 Mt Diablo....5¼@5½
150 Manhattan....2¼
355 Metallic....60@90c
155 Northern Belle. 3.70@3¾
200 N Belle Is....35c
770 N Noonday....2½@2.60
400 Navajo....45@50c
70 Noonday....3

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Argonaut M & M Co	California	2	10	Oct 7	Nov 15	Dec 8	J L Fields	240 Montgomery st
Bechtel Con M Co	California	3	15	Oct 1	Nov 5	Nov 25	W H Lent	309 Montgomery st
Benton Con M Co	Nevada	2	50	Sept 17	Oct 22	Nov 10	W H Watson	302 Montgomery st
Best & Belcher M Co	Nevada	15	1 00	Aug 29	Oct 2	Oct 22	Wm Willis	309 Montgomery st
Caledonia S M Co	Nevada	28	50	Aug 21	Sept 26	Oct 17	R Wegener	414 California st
Chollar M Co	Nevada	1	50	Aug 29	Oct 3	Oct 24	W E Dean	203 Bush st
Crown Point G & S M Co	Nevada	38	1 00	Aug 27	Oct 1	Oct 22	James Newlands	203 Bush st
Concordia M Co	California	12	15	Aug 20	Sept 26	Oct 21	A W Fox	310 Pine st
Gila S M Co	Nevada	5	25	Sept 30	Nov 3	Nov 24	W W Parrish	328 Montgomery st
Grand Prize M Co	Nevada	2	50	Sept 17	Oct 21	Nov 11	J E Dixon	20 S F Stock Ex
Hale & Norcross S M Co	Nevada	62	1 00	Sept 9	Oct 14	Nov 4	J F Lightner	58 Nevada Block
Hussey Con G & S M Co	Nevada	9	15	Aug 25	Sept 30	Oct 21	Jno E Dixon	20 S. F. Stock Ex.
Jupiter M Co	California	5	30	Sept 18	Oct 21	Nov 10	E C Masten	22 Nevada Block
K K Con M Co	Nevada	9	2 00	Oct 3	Nov 5	Dec 3	B B Minor	309 Montgomery st
Leopard M Co	Nevada	12	50	Aug 23	Sept 26	Oct 17	Jno E Dixon	20 S F Stock Ex.
Mexican G & S M Co	Nevada	8	1 50	Sept 11	Oct 15	Nov 6	C L McCoy	203 Bush st
Mono G M Co	California	5	1 00	Sept 4	Oct 9	Oct 29	W H Lent	309 Montgomery st
Occidental Con G M Co	California	2	03	Aug 11	Sept 29	Oct 20	W T Smith	402 Montgomery st
Potosi M Co	Nevada	1	50	Aug 29	Oct 7	Oct 28	W E Dean	203 Bush st
Real Del Monte M Co	Nevada	8	1 00	Sept 18	Oct 20	Nov 29	C V Hubbard	203 Bush st
Savage M Co	Nevada	39	1 00	Sept 22	Oct 31	Nov 20	E B Holmes	309 Montgomery st
Sierra Nevada S M Co	Nevada	59	2 00	Aug 30	Oct 3	Oct 22	W W Stetsou	309 Montgomery st
Solid Silver G & S M Co	Nevada	2	25	Oct 6	Nov 10	Dec 8	J J Applegate	320 Sansome st
South Standard M Co	California	5	15	Sept 11	Oct 15	Nov 3	C A Sankey	331 Montgomery st
Succor M & M Co	Nevada	24	25	Aug 30	Oct 13	Nov 3	Wm H Watson	302 Montgomery st
Tioga Con M Co	California	7	30	Sept 10	Oct 15	Nov 4	W H Lent	62 Nevada Block
University G M Co	California	3	20	Aug 21	Sept 24	Oct 15	W L Oliver	328 Montgomery st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Hydraulic Grav M Co	California	1	20	Oct 2	Nov 10	Dec 13	James Ireland	216 Sansome st
Butte Creek Hyd M Co	California	3	15	Sept 18	Oct 20	Nov 5	R L Taylor	310 Pine st
Butte Hydraulic M Co	California	—	10 00	Aug 25	Sept 29	Oct 21	L L Dennery	328 Montgomery st
Crœsus G & S M Ce	California	2	10	Aug 22	Sept 23	Oct 11	E Huestis	328 Montgomery st
Dardanelles M Co	Nevada	7	50	Sept 9	Oct 10	Oct 27	H C Hinmau	411 California st
De Haro M Co	Nevada	2	10	Sept 24	Oct 27	Nov 12	W W Bausman	409 California st
Double Standard G M Co	California	1	10	Sept 13	Oct 21	Nov 11	W H Lent	309 Montgomery st
Diana G & S M Co	Nevada	4	10	Sept 24	Oct 28	Nov 15	J T McGeoghan	318 Pine st
Dudley M Co	California	5	50	Aug 14	Sept 17	Oct 13	E. C. Masteu	309 Montgomery st
Equitable Tunnel & M Co	Utah	21	10	Sept 16	Oct 21	Nov 14	C J Collins	227 Montgomery st
Geo Douglas M Co	Nevada	3	10	Sept 24	Oct 27	Nov 13	W W Bausman	409 California st
Hamburg M Co	Nevada	1	1 00	Sept 19	Oct 21	Nov 10	D A Jenning	401 California st
Joe Scates Con S M Co	Nevada	4	10	Sept 24	Oct 27	Nov 13	W W Bausman	409 California st
J & K G M Co	California	1	15	Sept 29	Nov 3	Nov 24	W H Lent	309 Montgomery st
Maybelle Con M Co	California	3	10	Sept 6	Oct 15	Nov 10	A W Fox	310 Pine st
Meadow Valley M Co	Nevada	15	25	Sept 12	Oct 22	Nov 17	T W Colburn	414 California st
Monte Cristo Con M Co	California	1	10	Oct 3	Nov 17	Dec 15	Butler Burris	309 Montgomery st
Mt Hood M Co	Nevada	3	10	Sept 24	Oct 27	Nov 13	W W Bausman	409 California st
Nob Hill G & S M Co	California	1	15	Oct 6	Nov 10	Nov 28	J H Sayre	330 Pine st
North Scorpion M Co	Nevada	1	10	Aug 11	Oct 15	Nov 6	T B Ludlum	211 Sansome st
Quartz Mountain G M Co	California	7	50	Sept 20	Oct 27	Nov 17	E Hestres	729 Montgomery st
Red Hill H M & W Co	California	2	03	Sept 1	Oct 2	Oct 18	A B Paul	228 Montgomery st
Sabine M Co	Nevada	2	10	Sept 24	Oct 27	Nov 12	W W Bausman	409 California st
Santa Mina G M Co	California	1	15	Aug 29	Oct 2	Oct 22	J H Sayre	330 Pine st
Sherwood Con M Co	Nevada	2	10	Sept 1	Oct 6	Oct 23	H S Stone	309 California st
South Utah M Co	Nevada	3	10	Sept 5	Oct 6	Oct 25	C S Healy	45 Merchants Ex
South Comstock G & S M Co	Nevada	6	25	Sept 9	Oct 13	Nov 3	J M Buffington	309 California st
Tolo M Co	Nevada	2	10	Sept 24	Oct 27	Nov 12	W W Bausman	409 California st
Vancouver M Co	Nevada	3	10	Sept 24	Oct 27	Nov 13	W W Bausman	409 California st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Alexander M Co	——	A B Cooper	328 Montgomery st	Annual	Oct 15
Belvidere M Co	Nevada	C V Hubbard	203 Bush st	Annual	Oct 21
Commonwealth Con M Co	——	C A Morse	217 Sansome st	Annual	Oct 22
DeFrees M & M Co	California	T Ealkinson	318 Pine st	Annual	Oct 20
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	Annual	Oct 20
Gila S M Co	Arizoua	W W Parrish	328 Montgomery st	Special	Oct 21
Indicator M Co	——	Jas Newlands	203 Bush st	Special	Oct 10
Mammoth Grove M Co	California	A B Paul	328 Montgomery st	Stockholders	Oct 9
Occidental Con G M Co	California	W T Smith	402 Montgomery st	Annual	Nov 1
Oroville Grav M Co	California	J T McGeoghehan	318 Pine st	Annual	Oct 15
Rough & Ready Con G & S M Co	Cal	W H Lent	309 Montgomery st	Annual	Oct 13
Shawmut G Q M Co	California	J S Bacon	316 California st	Annual	Oct 23
Silver West Con M Co	Nevada	F R Bunker	606 Montgomery st	Annual	Oct 14
Syndicate M Co	California	Jacob Stadfeldt Jr	419 California st	Annual	Oct 16
True Blue Con M Co	——	H R Miller	405 California st	Annual	Oct 20

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Belle Isle M Co	Nevada	John E Dixon	Stock Exchange	75	Oct 6
Bodie Con M Co	California	W H Lent	Nevada Block	50	Oct 1
California M Co	Nevada	C P Gordon	23 Nevada Block	50	Aug 17
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	60	Aug 16
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	1 00	July 21
Independence M Co	Nevada	John E Dixon	Stock Exchange	25	Aug 21
Indian Queen M & M Co	——	A K Durhrow	69 Nevada Block	20	Aug 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	July 26
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	30	July 28
Montezuma M & M Co	——	J T McGeoghegan	318 Pine st	25	Aug 12
Pioneer M Co	California	J W Pew	310 Pine st	08	October 6
Standard Con M Co	California	Wm Willis	309 Montgomery st	50	Oct 13

750 Oriental....15c
200 Orient....35c
300 Paradise....1¾@1.70
375 Queen Bee....25@20c
45 Real del Monte....2½
215 Raymond & E...1.15@1¼
110 S Bodie....20@25c
90 Summit....1.35
15 Silver King....6
430 Tioga Con....2.70@2.65
100 Tiptop....1.20
100 Tuscarora....40c
100 University....30c
50 Wales....16½

SALES OF LAST WEEK AND THIS COMPARED

Thursday A. M., Oct. 2.
85 Alta....5¼
80 Alpha....17@16¾
450 Andes....1.10@1.05
305 Benton....3@2.95
120 Best & Belcher...17⅜@16
160 Belcher....4
265 Bullion....8½@8
140 Caledonia....2¼
150 Challenge....2.20@2.10
185 California....5⅜@5¼
745 Con Virginia....5⅜@5¼
1020 Con Imperial....1.30
280 Crown Point....4¼@4.30
50 Confidence....9⅞@9¾
550 C Dorado....1.95
315 Exchequer....5¾@5⅜
75 Flowery....65@70c
155 Gould & Curry....10½
910 Golden Gate....3
210 Hale & Nor....12¾
90 Justice....3.30
355 Julia....4.10@4.05
70 Kentuck....4¼
830 Lady Wash....1
1020 L Bryan....85@90c
350 Leviathan....55@60c
695 Mexican....35@34¾
200 Mackey....1.10
100 N Bonanza....1.55@1.60
350 New York....55@60c
110 North Con Vir....9
255 Occidental....3@2.90
770 Ophir....39@38½
100 Overman....9½@9¾
610 Potosi....5⅝@6
290 Savage....12¼
660 Sierra Nevada....48@49
50 Solid Silver....50c
230 Scorpion....3.30@3.35
130 Silver Hill....1.40
100 Trojan....20c
310 Utah....19@19¾
790 Union Con....68@67½
370 Ward....3
150 Yellow Jacket...15½@15¾

AFTERNOON SESSION.
1000 Albion....20c
300 Argenta....95@90c
50 Aurora T....10c
50 Belvidere....90c
20 Bulwer....11
1225 Belle Isle....5¼@5
1300 Big Prize....35c
210 Bodie....12½@12¾
890 Bechtel....1.05@1
500 Belmont....65@60c
125 Black Hawk....80@75c
210 Booker....80@90c
1000 B Chief....60c
200 Boston....1½@1.55
800 Champion....30c
150 C Pacific....7⅜@7½
1550 Crœsus....20@25c
2430 Day....1½@1.40
375 Dudley....1.10
330 Eureka Con....24½@25
300 Endowment....50c
100 Goodshaw....30c
190 Golden Terra....13
80 Grand Prize....2.10
595 Hillside....1.60@1¾
100 Hamburg....10c
100 Hussey....10c
370 Independence....1¾
100 Meadow Valley....5c
700 Martin White...1.70@1¾
530 Metallic....70c
300 Mt Diablo....6
125 Mono....5¾@5½
680 Manhattan....3
220 McClinton....65c
195 Mammoth....6½
180 Noonday....2.99@2.95
200 N Belle Is....40c
70 Northern Belle....3¾
100 Navajo....35c
110 Paradise....1¾@1.70
800 S Bodie....20@25c
245 Star....50@65c
200 S Bulwer....40c
105 Syndicate....5
110 Summit....1½
390 Silver King....6¼@6
500 Tiptop....1.05
250 Tioga Con....2.60
500 Tuscarora....20c
750 University....25c
230 Wales....17@18

Thursd'y A. M., Oct. 9.
100 Alpha....17
190 Alta....5
440 Andes....1.10@1.05
300 B & Belcher....17½@17⅜
2060 Bullion....9¼@9⅛
255 Belcher....3.70@3.80
245 Benton....2.85@2.90
365 California....5¼
500 Con Virginia....5⅜@5¼
280 Crown Point....4.10
15 Chollar....7
400 Con Imperial....1.20
130 Caledonia....2.30
20 Challenge....2.10
250 Dardanelles....40c
325 Exchequer....5⅞@5⅝
50 Flowery....65c
200 Gould & Curry....10
410 Golden Gate....4½@2½
365 Hale & Nor....12½@12¾
60 Justice....3.20
140 Julia....3.90@3.80
100 Kentuck....4.05@4
85 Lady Bryan....85@80c
1000 Lady Wash....90@85c
100 Leviathan....50c
135 Mexican....31½@31¾
30 Mackey....1
150 Mt View....2½@2.60
450 N Bonanza....1.45@1.35
50 New York....45c
335 Ophir....33¾@34
20 Overman....9
115 Occidental....2.30
375 Potosi....5¾@6
180 Plutus....2.30@2¼
100 St Louis....30c
190 Savage....12⅞
325 Sierra Nevada....48¾
385 Silver Hill....1¼
340 Scorpion....3.40
675 Trojan....20c
370 Union....67½@67¾
335 Ward....2.85@2.60
220 Yellow Jacket...15⅞@15¾

AFTERNOON SESSION.
100 Albion....15c
290 Addenda....40c
150 Argenta....75c
240 Belmont....75c
100 Booker....80c
70 Sulwer....11½
325 Belle Isle....4½
150 Black Hawk....75c
600 Big Prize....35c
110 Bodie....12½@12¾
40 Boston....1.35
200 Bechtel....1.10@1.16
500 Champion....25c
120 C Pacific....7¼
300 Crœsus....20c
3350 Day....1.15@1.20
65 Eureka Con....26
230 Grand Prize....2@2.05
350 Goodshaw....30c
100 Hillside....1.80
100 Indepeudence....1¼
290 Jupiter....1@95c
100 Leeds....50c
150 Mammoth....6¼
100 Manhattan....2¾
150 Meadow Valley....5c
100 Metallic....80c
50 Mono....6½
100 Mt Diahlo....6
100 N Belle Is....35c
1150 Navajo....65@55c
15 Northern Belle....3¾
45 Noonday....2¾
750 N Noonday....2½@2.60
500 Oriental....10c
200 Orient....35@30c
350 Queen Bee....20c
100 Richer....25c
230 Raymond & E...1.20@1¼
250 S Bodie....20c
20 S Bulwer....50c
150 Syndicate....4.80@4.90
300 Star....65c
10 Silver King....6
140 Summit....1.40
215 Tioga Con....2.70@2.60
425 Tiptop....1@1.15
300 University....25c

California Board—Latest Sales.

Wed'sday A. M., Oct. 8.
20 Alpha....17¼
30 Alta....5⅜
500 Atlas....20c
30 Best & Belcher...17⅜@17½
60 Bullion....10@9¾
110 California....5¼@5⅜
40 Con Virginia....5⅜
250 Con Imperial....1¼
40 Crown Point....4.20
30 Chollar....7
120 Challenge....2.20@2¼
40 Caledonia....2.30
20 Exchequer....6⅜
20 Gould & Curry....10
40 Hale & Nor....12@12½
50 Justice....3.20@3¼
20 Julia....4¼@4.20
40 Mexican....32@32½
200 Mint....8c
1000 N Scorpion....5c
30 Ophir....33¼@33½
30 Potosi....6¼
20 Savage....12½@12¼
20 Sierra Nevada...49½@48½
900 S Utah....5c
10 Union Con....67
100 Ward....2.95
10 Yellow Jacket....15½

AFTERNOON SESSION.
20 Alpha....17½
30 Alta....5¼
40 Andes....1.17½@1¼
950 Atlas....18@20c
30 Belcher....3¾
10 Best & Belcher....17¼
220 Bullion....9¼@9½
60 California....5⅜
20 Con Virginia....5¼
200 Con Imperial....1¼
40 Crown Point....4.20
30 Exchequer....5¾
100 Enterprise....1½
40 Gould & Curry....10
100 Golden Chariot....6c
100 Gipsy Q....50c
30 Hale & Nor....12½
30 Julia....4
50 Justice....3.20
20 Mexican....31¼
100 Newark....13c
30 Ophir....33½
20 Potosi....6¼
20 Savage....12⅞
10 Sierra Nevada....49
200 S Utah....4@5c
10 Union Con....67
10 Yellow Jacket....16¼

Pacific Board—Latest Sales.

Wednesday A. M., Oct. 8.

10 Alpha	17¢	60 S Nevada	49@49¢
70 Andes	1.10@1.15	200 Trojan	20c
210 Booker	75@65c	20 Union	67¢
600 Bullion	10¢@¢	20 Yellow Jacket	15¢
40 Best & Belcher	17¢	AFTERNOON SESSION.	
130 Belcher	34	100 Argenta	90c
90 Chollar	7	100 Andes	1.15
420 Con Imperial	1¢	5 Best & Belcher	17¢
130 Caledonia	2¢	455 Bullion	9¢@9
100 California	5.30	20 Bodie	12¢
10 Con Virginia	51	15 Caledonia	2.20
190 Crown Point	4.10@4.15	65 Con Virginia	51
200 Exchequer	6 40@6	250 C P Ravine	20c
200 Gould & Curry	10c@10¢	150 Exchequer	5¢@¢
170 Hale & Nor	12@12¢	50 Flowery	50c
300 Justice	3	100 Gould & Curry	10c@10¢
120 Julia	4.10@4	50 Justice	3.15
160 Mexican	31¢@31¢	100 M White	1.90
110 New York	50c	200 New York	50c
100 N Bonanza	1¢	20 N Bonanza	1.40
50 Ophir	32¢@33	10 Ophir	33¢
170 Potosi	6¢	170 Potosi	5¢@6
30 Silver Hill	1.45	65 Uncle Sam	2@2.05
20 Savage	12¢	20 Union Con	65¢@67¢
		20 Yellow Jacket	15¢

The Mining Share Market.

A survey of the markct for the past week does not present any features that will gladden the heart of the speculator. It seems to be pining away under the affliction of general debility, and not a sign of convalescence appears to encourage operators. It does not require much wisdom to perceive that a change has taken place in stock business, so far as speculation is concerned. The indications point to the gradual withdrawal of a business element which has heretofore given it whatever stability or rather energy it had. The two extremes of manipulators and impecunious chippers are left to mourn over the wide gap which is daily becoming more impassable. The upper and nether millstones of this business are still revolving, but the fat grain in the shape of investors are wanting to feed them. Active mining is becoming a business to replace the idle dreams of wealth formerly indulged in as regards the stock business. The New York *Graphic* claims that before long the seat of mining speculation will be transferred from the Pacific coast to the East, with New York as the center. Speculation may run rife in the East, but the control of the mines will not and cannot be transferred hence. Our developing interests are within home control and likely to remain there. Betting upon the results may be monopolized and welcome by the East. We have not the least obstacle to throw in the way of its speedy transfer to that point. The glittering bubbles of exaggeration from mines controlled already by Eastern manipulators cannot affect the solid streams of bullion turned out by our recuperating mines. The actual metal possesses weight, solidity and value, and is in continual demand. This we have, and propose to keep it or exchange only for something of equal value, not for the paper certificates so anxiously desired in the East.

Miners' Association.

Heretofore there has been in existence an organization known as "The Hydraulic Miners' Association," which has lately exchanged that name for the more appropriate one at the head of this article. It is understood that the association is solely in the mining interest, and proposes to protect every interest connected with mining where any general principle is involved. It is a patent fact that there is no one class of our citizens better able to protect themselves and their interests than our miners, and it would seem as if the influences brought to bear against them had assumed some particularly threatening aspect, since they are compelled to combine for protection. Perhaps we ought not to say that there is a necessity for this action, but from the character of the gentlemen forming the Board of Council, we are compelled to believe that the unyielding conflict now in progress in certain localities is proving detrimental to our mining interests, and that the only method appropriate to meet the battle is in organizing. It is to be regretted that agriculture and mining should be arrayed against each other—"a divided house," so to speak. The two elements are necessary to the future of California, and it is a sad commentary upon progress to believe that there is no hope of accommodation. In union, however, there is strength and wisdom, and we believe that much good will be accomplished by the Miners' Association, now that it comprehends every branch of our mining industry.

Its Board of Council consists of the following well-known gentlemen, all of whom take an active interest in its affairs: Egbert Judson, L. L. Robinson, Alexander Weil, William Ashburner, Hamilton Smith, H. D. Bacon, Thomas Bell, Alvinza Hayward, Levi Stevens, Thomas Price, J. P. Pierce, A. A. Sargent, R. E. Brewster. Its officers are: Hamilton Smith, President; L. L. Robinson, Vice-President; Lazard Freres, Treasurer. Its offices are at 320 Sansome street, room 23.

PACIFIC COAST POSTAL CHANGES.—Following are the postal changes on the Pacific coast the past week:. Offices established—Pine creek, Nye county, Nevada, Allen Crahtree, Postmaster. Irene, Whitman county, Washington Territory, James W. Offield, Postmaster. Oro Blanco, Pima county, Arizona, Wm. J. Ross, Postmaster. Offices discontinued—Judsonville, Contra Costa county, Cal.; Thompson, Wasco county, Oregon; Ana Costa, Whitman county, Washington Territory.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

ALPINE.

ITEMS.—The Monitor *Argus* says a tunnel has been commenced under the croppings of Monitor mountain to cut the ledge 500 ft from the surface. This mountain contains the most prominent croppings of the district, and is owned by the Lincoln G. & S. M. Co. In the Mogul district the Virginia and California locations have been consolidated. The property has been prospected by a tunnel 300 ft in length, and a body of low-grade ore was struck 180 ft from the mouth. Not having attained depth below the surface sufficient, it is the intention to sink a shaft. In Monitor district, since August 1st of this year, 12 important mining locations have been made. One of the most promising of these is the Wild Yankee. On this claim a tunnel has been run 140 ft. During the last 20 ft run, feeders of ore have been cut, which assay from $50 to $85 per ton, in gold and silver. About 10% gold and 60% silver.

AMADOR.

VOLCANO TUNNEL.—*Ledger*, Oct. 4: A distance of 900 ft remains to be bored, and it is reported that a contract has been let for the entire work at $35 per foot, with the stipulation that the work be completed in ten months.

NEW DITCH.—Hadley & Vair are constructing a new ditch for mining purposes. The ditch will tap the South Fork of the Consumnes, and carry the water to a point known as Frosy hill, five miles above Oleta, to operate a gravel claim in that vicinity. The ditch will be nine miles in length. Thirty men are at work on it, expecting to finish in six weeks.

TALISMAN.—The 10-stamp mill connected with this mine was started up last Monday, after a period of idleness. It is running on a vein of quartz, about a foot wide, met with in the prospecting operations which have been carried on for months past. It is believed that this lead will pay well.

DOWNS MINE.—The sinking operations at this claim have proved satisfactory. The ore body is larger than ever, and maintains its rich quality. It shows five ft of solid ledge. The mill is not running steadily, owing to the scarcity of water.

SEATON MINE.—Boiler for new hoisting works passed through town a few days ago. A new shaft has been started with a full force of men.

PLYMOUTH ITEMS.—Whitney & Snables, who have been working a rich pocket claim, three miles north of Plymouth, for more than a year, are now in with their tunnel about 125 ft. They have passed through various strata of quartz, but have not reached the main ledge as yet. They have already taken out a large amount in rich pockets, but hope by running a tunnel, to strike the ledge and get milling ore.

BUTTE.

ITEMS.—*Mercury*, Oct. 3: John W. Spencer has leased the Big Bar Gravel mine for one year, and will put a force of men at work as soon as the rain falls in quantities sufficient to operate the mine. The Superintendent of the Buchanan mine a few days ago brought in 13½ ounces of fine gold, the result of 5 hours' run. Parties have purchased the old Vail mine, located in the vicinity of Forbestown. They intend to reopen and work the claim for all it is worth, and have already begun operations. To do this it will be necessary to construct only about 80 ft of flume in order to obtain an excellent supply of water. A four-ft bedrock flume is now being put in. This is the mine from which Sandy Anderson took $11,000 in less than three months a few years back, and then lost the ledge. A party of five men are engaged in opening up a quartz ledge of more than usual promise, located on the Morris ravine ridge, three miles from town. The rock assays very high. It appears to be a well-defined ledge and can be traced for several hundred ft. A 10-stamp mill will shortly be erected on the property, the company believing they have sufficient ore on the dump to warrant such outlay.

EL DORADO.

OCHER.—A fine deposit of ocher has been found at Carr's mill, El Dorado county. Its quality is pronounced excellent.

LASSEN.

MINERAL VEINS IN LASSEN COUNTY.—Reno *Gazette*: Near the Junction, in Lassen county, on the Susanville road, several promising ledges have been lately discovered. An active prospector has been going over that region, and has made a number of locations. Assays from one ledge ran from $4 to $22, gold and silver about equally mixed. One ledge shows free gold to the naked eye. The veins are narrow, about 15 inches in width. The ore is described as free milling. The country rock is granite. There is an abundance of timber where these discoveries have been made.

MARIPOSA.

MINING ENTERPRISE.—*Gazette*, Oct. 4: The following mines have lately been purchased by Eastern parties, and will be worked as soon as the rainy season furnishes water power, viz: Banderita, Martin and Welling, Gray Planet, Scanlon and the Merced extension to the Banderita. These mines have been idle for years.

MONO.

JUPITER.—Bodie *News*, Oct. 5: On the 400-ft level the west crosscut is in 136 ft; east crosscut, same level, is in 115 ft. Both crosscuts are in favorable vein formation; that to the west is looking specially well.

DUDLEY—Shaft down 30 ft below 400-ft station. Considerable water is encountered, but with the perfect working of the pumps no difficulty whatever is experienced.

BELVIDERE.—Engaged cutting out the station at the 300-ft station preparatory to starting east and west crosscuts. The ledge cut in the shaft has now pitched out to the east, but will again be cut in a short distance by the east crosscut. Since then another ledge has come in from the west, which we now have from the bottom of the shaft.

UNIVERSITY.—Engine and all machinery gives perfect satisfaction, and everything about the place is now working smoothly.

BLACKHAWK.—Shaft down 398 ft, rock quite hard at bottom. A little water has made its appearance. East drift at bottom of Warren winze from 300-ft level is now in 20 ft; cut several stringers of quartz, indicating that the ledge will be cut shortly.

LARE DISTRICT.—*Mining Review*, Oct 4: The middle tunnel of the Mammoth has 180 ft to run to reach the level above. Rock in lower tunnel hard, and considerable water flowing. In the True Blue, tunnel is in 235 ft. Several small stringers of quartz have been cut showing free gold.

NEVADA.

LUCRY ENTERPRISE.—*Herald*: About two months ago Messrs. Reseigh & Co. leased the Mohegan mine, which is located on Gold Flat, near the Thomas mine. They went to work taking out rock, and have just had 90 tons crushed at Crosby's mill. The result is $1,000 in gold and four tons of high-grade sulphurets, which will probably yield about half as much more. The mine had lain idle for a long time because it was thought of no value.

ENTERPRISE MINE.—This mine, says the *Herald*, is located northwest of the Allison Ranch, and the ledge is thought to be an extension of the old Wisconsin, which yielded handsomely some years ago. The owners have erected first-class hoisting machinery, and are pushing ahead the incline night and day. They are down a little over 150 ft at present, and have a good ledge which is increasing in size as they go down. At the surface it appears in the form of several stringers, but they unite a short distance below the surface and form a good ledge. Stoping will be commenced in a short time.

A NEW QUARTZ FIND.—Grass Valley *Union*: Within a few days a quartz ledge has been struck within the Oleubrook race course enclosure (the property of R. M. Fryer, Esq.) that gives promise of being a good find. The ledge was found by faint tracings of croppings on the surface, and by sinking a shaft about 12 ft in depth, a vein of quartz 16 inches in width was discovered, which is of excellent appearance and prospects fairly in gold. What gives interest to the discovery of the ledge is the fact that many years ago the ground near to it was worked as surface diggings, and a considerable amount of gold found in float quartz. The claim paid well up to a certain point, but beyond that was poor. It was believed then that a rich quartz vein was close at hand, but all attempts to find it were futile—the reason for which is now found in the fact that the prospectors did not go deep enough, contenting themselves with not going into the bedrock, which was covered with five or six ft of soil. Persons now living in the vicinity say that some $6,000 or $7,000 were taken out of this surface claim, below where this ledge is now found, and that from time to time since several hundred dollars worth of gold in float quartz has been found. These former finds have stimulated, of late, prospecting for the ledge believed to be close at hand, and the discovery above mentioned is the result. Work is to be continued on the ledge, and from its size and general good appearance it is believed to be a discovery of value.

IDAHO.—Grass Valley *Union*, Oct. 7: The work of sinking the incline below No. 11 level was started a few days ago, and has been sunk 12 ft. The incline is in hard ground, which carries a strong ledge of low-grade ore. No. 11 in 100 ft east, ledge strong, but of low grade. No. 10 has been driven 500 ft east. The ledge in this drift does not carry as well as formerly, but within a few days it has shown improvement both in size and quality. No. 9 level is about worked out. No. 8 still contains a large amount of ore. No 7 is nearly worked out. West of the main shaft, between the 6th and 7th levels, there is yet some good pay ore which is being extracted. The mine is not yielding as well as formerly, as the ledge does not carry as large as it did in the lower east drifts, owing to a change of ground, but it is hoped that it is but temporary, and that before many months the ledge will resume its usual size and quality, as No. 11 is carrying a strong ledge, and the winze below that level is showing the same. Only 35 stamps out of 50 have been running for several months.

NEW YORK HILL.—The main incline has reached a depth of 1050 ft, the ledge showing an increasing width and the rock being of good paying quality, a south drift, No. 10, has been started, which will be driven south 500 ft or more to catch the rich chute which was found in the upper levels in that part of the mine. This drift is now in a distance of 35 ft, and shows a 12-inch ledge of good paying rock. No. 9 drift north is in 350 ft. The last crushing of 200 loads of rock, made in September, paid $50 per load.

EMPIRE.—The new shaft on the Rich hill ledge, the same the company has been working for several years, is now down 80 ft. The ledge in the shaft is 20 inches and over in size, and prospects well. The new hoisting works are running and the tramways connecting with the mill completed. In about two weeks the mine will resume operations with a full force, about 100 men, and the full head of the 20-stamp mill started. The old mine is still being worked to some extent by tributers, 16 of whom are taking rock from the old stopes.

AJAX.—Is a new location on Wolf creek south of the Allison mine. A shaft has been sunk 20 ft, and a ledge opened on which prospects well in fine gold. A six-inch pump has been put in the shaft to enable a crushing being taken out as a prospect.

PACIFIC, adjoining the New Rocky Bar and Irish-American ground on New York hill, has had a crushing lately at Sothern's mill, which paid $185 per ton exclusive of sulphurets.

SURPRISE.—North end of Allison Ranch, are sinking incline and drifting both ways from the shaft. The ledge in shaft and drifts is of good size, and free gold and sulphurets are plentiful throughout the rock.

SOAPSTONE.—The soapstone strata of the quarry near Colfax (lately discovered to contain gold), has a width of from 60 to 70 ft, contains quite a percentage of sulphurets, and these alone contain the gold. No difficulty is experienced in crushing it. Four loads crushed at Sothern's mill yielded $20 in handsome retorted amalgam. The material passed through fine screens easily. The sulphurets are fine, however, and require careful manipulation to save them.

DEADWOOD.—*Transcript*: A 276-ounce bar, worth in the neighborhood of $5,000 and representing the free gold from 125 tons of ore from the 160 level of that claim, was at the Citizens' Bank lately. Besides this bar, the quartz produced 10 tons of sulphurets worth about $100 per ton. The $6,000 worth of gold and sulphurets has been extracted in the last two weeks. The level referred to has yielded $50,000 since being opened.

ROCKY BAR.—The drift between the new shaft and the old Chevanne shaft now lacks but 40 ft of a connection. This connecting drift is being run from both shafts, and is showing a ledge of good size and quality. The drain drift connecting with the New York Hill mine has yet a distance to be run of 125 ft, and will be completed in time to take any increase of surface water that may come by reason of the winter rains. With this connection made the mine will have a thorough drainage to a perpendicular depth of 175 ft, or about 370 ft on the incline, which will save pumping as well as a large item in the expense of fuel. The last crushing of rock from the mine, 250 loads, yielded $30 per load, independent of the sulphurets, which go $40 per ton. Between 70 and 80 men are employed about the mine.

WASHINGTON.—The new shaft, which is a fine piece of work, has been sunk 105 ft to the old level. Another contract for sinking 50 ft was recently let, of which 15 ft is completed. The ledge and ledge matter shows in the shaft from two to three ft in width. The new shaft is 11 by 4½ ft in the clear, timbered throughout, and is in three compartments. A new water wheel, 40 ft in diameter, driven by water from the Idaho ditch, does the pumping and hoisting from the mine, and furnishes ample power.

CENTENNIAL.—No. 3 level south, which is the lowest level, has now a ledge of good ore, and the winze through to the second level shows a good ledge. A crushing of 120 loads is now going through the Orleans mill, which is considered good for $50 per load.

LONE TREE.—This is a location one-half mile east of the Forest Springs school house, made several months ago. Several prospect shafts have been put down, the deepest 26 ft, which disclosee two ledgee with a clay seam between, which gives the promise of the two making together. The rock prospects richly in heavy, coarse gold, and the dirt next the ledges pans out richly.

PLUMAS.

GRANITE BASIN.—*National*, Oct. 4: Mining is brisk. Sullivan, O'Brien & Co. have completed their arastra, but lack a little water to have enough to run it. They are taking out quartz at present, and making ready for the wet season. A new mill and engine are on the way here, and five log cabins are going up on Arastra creek. Louis Lose has an arastra in operation, and rock assays $26 per ton. See & Serrin's mill is working every day.

SPANISH PEAK GRAVEL.—An extensive gravel mining operation is about to be inaugurated in the immediate vicinity of Spanish Peak. A location of 320 acres has been made on the southwestern slope of the mountain, and tunneling operations will be commenced at once.

PLACER.

RICH GRAVEL.—*Herald*, Oct. 4: Breece & Wheeler, of Bath, who commenced running a drift tunnel in the claim some time ago, are now employing 10 or 12 men in taking out gravel which is said to be very rich.

SAN BERNARDINO.

MOHAVE RIVER.—A correspondent in the Santa Ana *Herald* says he is located five miles northeast of this river, 60 miles southwest of Death valley and 50 north of San Bernardino. The mountains are of limestone formation and rich in minerals. One silver and copper lode is 10 ft wide, cropping out for three-quarters of a mile. The top rock assayed $135 per ton silver and copper. Lower down on the ledge the rock is better looking. He says: "I put a piece in the fire and when it was at a red heat I poured water on it, and immediately the surface was covered with splotches of fine silver. I have no doubt it would assay $300 per ton. There are two companies located here, about 30 men in all—eleven are now in camp."

SANTA CLARA.

COAL TEST.—*Mercury*, Oct. 5: Specimens of coal from the San Jose coal mine in Vallicitos canyon were tested at the San Jose foundry Friday afternoon. For foundry purposes in this city the coal will not suit, but for the purpose of manufacturing chilled iron it is very desirable. Mr. Mitchell, the foundry man, considers that any kind of iron placed in this coal will come out thoroughly chilled, and that in the manufacture of rail wheels for railroads it is unsurpassed.

SIERRA.

MILTON.—Dr. Holsworth, an old prospector, has a mammoth gravel claim at Milton, on the Middle Yuba river, 18 miles east of Graniteville, Nevada county. Last week in running a single box, 16 ft long, he took out one $50 nugget and about $20 in smaller pieces. He has just recorded another claim, to be known as the Mastodon, which adjoins it. He has made arrangements with a Virginia City company to erect works on the latter and commence sinking a shaft. He is of the opinion that they will have to go down about 300 ft to reach the channel known to be there. Three other companies are now engaged in tunneling in the immediate vicinity to open up drift diggings, and all of them have a splendid outlook. The Doctor says there are a large number of rich quartz ledges of unusual dimensions that run through the section, but no work has been done on them. He had a 50-foot ledge of rock on his own land that mystified him for a long time. He tested it himself, and got numerous other parties to do so, but none of them could tell what the glistening particles with which it abounded were. Finally he took some of it to San Francisco to be tested by Brown's process. The assayer said that there was platinum in it. Knowing that Edison, the great inventor, was seeking all over the continent for deposits of this metal with which to tip his electric burners, the Doctor sent several average samples to him, at Menlo Park. Prof. Edison has sent back the result of the assays. He says he finds the quartz very rich in platinum and gold. He seems to feel some doubt as to the reality of the discovery, but says an agent of his will arrive on the ground shortly and make a thorough examination. Eight miles below Milton, on the Forest City ridge and along the river, considerable prospecting is going on. A German company have struck the channel in drifting, and found coarse gold. None of the nuggets are worth less than 50 cents.

QUAKER HILL.—The channel in Sargent & Jacob's cement claim has now been pushed through for a distance of 126 ft without the rim-rock opposite the shaft being reached. The bed of gravel is from 15 to 16 ft deep. The dirt is quite even all the way, paying from 25 cents to $1 per pan. The prospecting shaft is too far removed from the channel to admit of convenient working, and a new one is to be sunk immediately at a point 600 ft southeast of it.

TUOLUMNE.

ONOFRIO.—*Independent*, Oct. 4: New parties are erecting new hoisting works. The rock is good, assaying at $60 to $80 per ton.

LOUISIANA.—We were this week shown some rich rock from the 300-ft level of the Louisiana mine, located near Cherokee. A large and rich ore body has recently been struck in the same mine.

WATERS.—A fine 20-stamp mill is being erected at this mine, which is below Tuttletown. The ore is classed as low grade, but some of it will probably mill $10 per ton. The immense body of it and the low cost of getting it to the mill will secure large returns even at a small yield per ton.

ITEMS.—We are told that Aleck Laird, a former resident of Angels, has recently struck a rich lead of quartz near Tuttletown. Our informant tells us that he was shown a couple of pieces of ore from Laird's mine that were very rich, and as he expressed it, literally lined with gold. Strain, the pioneer pocket miner, who 20 years ago found a number of large nuggets of gold on San Diego hill, east of Columbia, the largest of which netted him $10,000, has commenced driving a tunnel into the hill, with a view of intersecting the vein or veins from which so much rich float rock has been scattered over the surface and found from time to time. The portal of the tunnel is but a few yards from where he found the $10,000 nugget.

NEVADA.

WASHOE DISTRICT.

SUTRO TUNNEL PROSPECTING.—Gold Hill *News*: Three new prospecting drifts have been started from the Sutro tunnel and are, with that between the Occidental ledge and Star lode, being driven ahead by regular shifts. The latter drift is now in 70 ft and in country rock. The first of these new drifts starts north near the east wall of the Star lode and is being run in the ledge. The vein of this lode, where cut by the Sutro tunnel, is 100 ft wide and contains low grade quartz. The drift just started was last evening in 20 ft and had already encountered ore assaying $34 per ton. The next drift is running south just inside the footwall of the Star lode, and was also last evening in 20 ft. Here, also, fine ledge matter is found to exist and the quartz yields low assays. The third prospecting drift is north along the west edge of the fissure of the Occidental ledge. Where that ledge is intersected by the tunnel there is nothing but a fissure from which, however, when cut, water gushed in sheets. The tunnel seems to have struck a pinch in it.

JULIA CON.—Gold Hill *News*, Oct. 9: The heat is excessive and the steam fairly parboils the workmen, making progress slow.

YELLOW JACKET.—One cylinder of the new hoisting engine is in position and the other will be in to-day.

LEVIATHAN.—North lateral drift on 750 level passed through a small feeder of quartz yesterday which assayed $10 per ton.

GOLDEN STANDARD.—The working tunnel is being constructed large enough for a double track.

OPHIR.—The crosscut east on the 2300 level, from the face of the main drift in that direction has encountered ore giving low assays. It has not penetrated the formation far enough to determine its value or extent, or whether it is the Hardy vein or a stringer from it, although it has been struck somewhere near where that vein might be looked for on this level. Its identity can be better determined when the crosscut has passed through it. An important connection will be made during the latter part of this week between the joint Mexican raise from the 2300 level and the joint winze from the 2100 level. When this connection is made and requisite ventilation secured, a joint crosscut will be started west on this level. Its importance will be at once manifest when it is remembered that streaks of ore pitching to the west have been encountered in the winze and also in the joint crosscut west on the 2000 level.

UNION CON.—The water has been drained from the 2300 level of the Sierra Nevada incline (Union 2400), and Thursday the contemplated drift south and west passing under the Union shaft and following the diamond drill-hole will be started. The drill found ore in that direction. The drift east, 1600 level, will, the last of this week, meet that running west from the Union shaft. The Union shaft is being sunk at the rate of 3½ ft per day, the bottom showing streaks of ore giving good assays; total depth below the 2300 level, 40 ft.

UNION SHAFT.—The shaft is now 40 ft below the 2300 station, the bottom showing ore giving good assays. Connection will be made the last of this week between the drift west, 1600 level, and that east from the Union's main north drift on that level.

[CONTINUED ON PAGE 236.]

El Dorado County Mines.

Mr. Bennett, in the El Dorado County *Republican*, writing of the mining interests of that county, says the Pacific has been worked more or less for nearly 30 years, and the aggregate yield $1,500,000. Owing to litigation and a variety of causes, the mine has lain idle, shafts fallen in and a general state of disuse prevailed, until an enterprising company of Londoners came into possession. Since when, the work has been silently, but steadily going on, in the most satisfactory manner. Two mills, now in process of erection, hoisting works, and restored condition of the shafts and drifts, give promise of speedy and gratifying results, whereby the interests of the entire county will be greatly enhanced and benefited. Its nearness to Placerville, which lies in the shadow of its mills, the abundance of wood, water and other facilities, make it one of the most desirable mining properties on the Pacific slope. The quartz, in color, is an opaque white, finely laminated, carrying free gold and permeated, more or less, with rich sulphuret. The gold is passed by insensible gradation into the rock, and all the indications prove it to be a true fissure vein, causing it to be held in high repute by experts. The dip is toward the east. This lode is in the same great belt as the Keystone mine, in Amador county, and is directly on the "Mother lode." Ore is now being taken out in considerable quantities. The walls are green-stone and black slate. A tunnel tapping the main working shaft at a depth of 160 feet, affords ample ventilation. The Little Elephant, a recent English invention, is being tested. There is claimed for it a capacity of one ton per hour.

The Rose mine is on a lode running parallel with the Pacific, but differing in the character of its quartz. It lacks the green-stone and is very heavily sulphureted. The ore is rich and yields good returns.

In Coon Hollow, above the gold-bearing gravel, is a stratum of volcanic formation, many feet in thickness. The gravel is 15, 20, and even 35 feet in thickness, in many places, and often carries gold throughout its depth. At Reservoir hill the same gravel bed appears. The outer crust is strongly marked, and beneath the volcanic, lies the gravel. Immense results have been realized from these washings at Coon Hollow especially.

Further south the principal mines are still active. Those near Logtown have commanded more or less attention for many years. Rich float has been found in the vicinity, and the red surface dirt, found on all sides, is a favorable indication, while from the earliest days, Mathews creek was known to be rich. It is a dead river, whose depressions are, to some extent, receiving fresh accumulations every winter by means of "winter streams" that cut through several lodes of auriferous quartz and gravel at its head. The coarseness of gold so deposited proves the nearness of these intersections.

The Springfield or Church Union is thought to be the most valuable lode in this neighborhood. It is handled by San Francisco capitalists. Drifts run north and south from the 500 and 700 levels. The richest ore ever discovered in the mine, has been found on the lowest level, and the sulphurets increase in value with the richness of the ores. The lode at the bottom of the shaft is from four to six feet in width, and is bounded by the country rock, which forms good substantial walls.

A number of lodes, including the El Dorado, Pocahontas, Empire and Excelsior, all in this vicinity, have been worked at intervals, and bear auriferous quartz.

The natural supplies are abundant, and roads not difficult of construction.

Petroleum in Peru.—It appears that F. Prentice, a well-known petroleum capitalist, of Titusville, Penn., is engaged in developing the oil deposits of Peru, having purchased an interest in some 4,000,000 of acres along the Pacific coast. He has contracted to sink 20 wells on the property within the next two years. His prospecting and experiments in that country have demonstrated that it contains the most remarkable oil territory yet discovered. Prentice is introducing crude petroleum for fuel, and people are beginning to use it largely. There are 50 English ocean steamers plying along the coast which contracted with Prentice to use crude petroleum instead of coal as fuel. They are erecting tanks for storing oil at different landings, and pay $3 a barrel. Sugar refineries are also preparing to use oil in place of coal. He pays a royalty, both to the Maucora estate and the Peruvian government, for the monopoly granted.

Prospecting.—The Placer *Herald* complains of those people who run off to Bodie, Arizona and everywhere under the sun but Placer county to hunt for gold, and says: "It is a cold, unvarnished fact, as the figures will demonstrate, this section of country, right here around Penryn, Newcastle, Ophir and Auburn, is the best district for prospectors in this or any adjoining State. The rock here hardly ever yields less than $10 or $12 per ton, often as high as $40 and $60, and not unfrequently a regular bonanza is struck. All prospectors, of course, don't strike it big, some hardly ever strike it at all, but the majority do well."

Vein Phenomena of the San Juan.

In a geological talk about the fissure veins of southwestern Colorado, in the San Juan country, H. F. Sickles says, in the Denver *Tribune*, that silver is the dominant precious metal abounding in the mountains, and is universally found in well-defined fissure veins in the crest of the rocks, where the crevice seems to be filled with an aggregation of mineral matter. In the various forms of metals found in the San Juan mines, may be found the native silver in wire form, in spangles and in grains. It also occurs penetrating crystals, or amorphous fragments of common quartz. The color is dull silver white, often tarnished brown by exterior accretions. It is not often found massive, but most frequently disseminated, and occurs ramose, reticulated and capillary. I have also seen many specimens of ore from our mines containing native silver in the form of crystallized tubes, octohedrons, rhomboidal and in tetrahedrons.

In some of the mineral districts of southwestern Colorado the ores fruit quite extensively in dicrasite or antimonial silver, which occurs in grains and in cylinders; also in curved laminæ, without cleavage, and fracture uneven.

THE COQUITA PALM TREE.

Another important constituent of our metalliferous deposits is the sulphuret of silver (silver glance). It occurs in octohedrons and in tube form; also reticulated, ramose lamelliform, amorphous and in splotches; cleavage quite imperfect; malleable and sectile, with fracture conchoidal. It is easily distinguished from native silver by its lack of specific gravity and its sulphurous odor under the blow-pipe.

The brittle sulphuret of silver (stephanite) most commonly occurs in hexahedral prisms, but it is sometimes massive and disseminated; structure foliated.

Muriate, or horn silver, is an important factor in formulating the ore in some of our mineral veins, and is a fruitful constituent in the extraction of precious metal.

Sulphureted antimonial silver (pyrargyrite) is found quite abundant in some localities. It is ordinarily membranous in structure and imperfectly foliated, but sometimes occurs in masses and grains; is capillary, and crystallized in hexahedral prisms.

Calcareous matrix is interspersed among nearly all of the ore of San Juan, in the various forms of spar, iron and copper pyrites, as well as the blue scale and fine buckly galena, are found in great abundance.

A rich strike of ore is said to have been made in the Bingham mine on the Poorman belt, Dakota, showing much free gold and in large pieces.

The Butte Basin.

This basin is now being worked, with a view to full development, by the Butte Basin Gravel mining company. It is situated in Amador county, and is regarded by the Amador *Ledger* to be of a peculiar formation. Mining experts freely express the opinion that there is nothing like it in the gold-bearing regions of this State, or in any other State, that they are aware of. The basin itself is probably a mile or more in circumference, and is generally conceded to be of volcanic origin. The surface diggings of early days in the basin and all around it, proved remarkably rich—in fact, it was one of the richest spots met with in the State. One of the peculiarities met with hereabouts was that no bedrock was encountered, and when the surface scratching was exhausted miners began to turn their attention to sinking, in the hope that further deposits of gold-bearing gravel would be met with. At various points around the rim of the basin proper rich gravel has been found, some of it yielding as high as $4 to the pan. One shaft was sunk near the margin to a considerable depth, and gravel, richly impregnated with the coveted metal, was obtained as far as the shaft penetrated into the bowels of the basin. The gravel was found to pitch at an angle of 35 or 40 degrees toward the center of the basin. No bedrock was touched, and nothing presented itself to show that the bedrock was near. The scarcity of water prevented a thorough research toward the heart of the formation. The completion of the Amador canal and branch ditch to the Butte has rendered mining operations at this point possible.

The company are exploring the basin by means of a shaft sunk near the center, which is now down 140 feet from the surface. The geological character of the rock through which they have passed is strange, and nonplusses all mining experts. It is of a whitish color, resembling mortar used by masons. There is no grit or sand in it, and it can be cut like chalk. The prevailing opinion is that it is of lava origin—nothing but fine ashes cemented together.

A new survey of the Catskills, by Prof. Guyot reveals mountains that were not known to exist. A large part of the region, especially the northwestern, is an untracked forest, and in several places the only chance for making triangulation was by climbing to the tops of high trees.

A 50-foot vein of cinnabar is reported discovered in Fremont county, showing good prospects at the surface. This is the first quicksilver discovered in Colorado.

The Industrial Outlook.

It is cheering to read the papers now-a-days. If one shuns the columns filled with loathsome sensations and horrors, with which nearly all the journals cater to the depraved tasts, from catch-penny motives, he is quite apt to feast upon a stirring industrial article, in which the many little indications of returning life to production and trade are gathered into a panoramic picture of approaching prosperity. This is all the more refreshing because we have been kept so long upon a diet of despondency and disaster. Since 1873 there has been a period of hushed machinery and buttoned pockets. At times signs have appeared of revival, but, though hopefully heralded, they have been followed by but little substance. The industrial disease was evidently one which had laid deep hold upon the material interests of the country, and had to be eradicated by a slow process. The patient had first to outlive the malady, and then recover from its effects. Convalescence has now apparently been reached, and the hearts of the people are cheered by the thought of active business, profitable production, and a quick turn of the dollar, which will give all a chance to dance to its ring.

Now, what are the indications, or, in other words, the real facts upon which a consciousness of revival is based? One of the leading financial writers of the East enumerates the following points: "The chief source of national prosperity, agriculture, has within recent years attained a very large expansion, and the crops of 1879 will largely exceed all precedent. Having already attained the position of the largest grain-exporting country, we are now beginning, also, to supply animal food in enormous quantities for the markets of Europe, and our dairy products are similarly forcing their way into countries from which they have hitherto been excluded. This development of our vast prairie regions lays the basis for a corresponding increase in the general commerce of the country, and provides employment for the new system of railroads constructed between 1866 and 1873, so largely in excess (as it was then supposed to be) of the prospective requirements of the country, but for which we are now beginning to find very useful employment. Our textile industries are turning out a larger quantity of goods to-day than at any previous period, and, perhaps, at more than an average rate of profit. The iron trade has suddenly recovered its wonted activity, and there is every probability that this year's product of iron and steel will exceed all precedent. The minor industries share equally with the larger ones in the general improvement; and with the exception of coal mining—which is still afflicted with over-production—there is hardly one branch of trade that is not now well and profitably employed. To these facts must be added the further one that, concurrently with very important deficiencies in the grain crops of Europe, we have this year by far the largest crops in the history of the country—a conjuncture which promises to augment our food exports beyond all former experience and to lay the basis for an increase of our inward as well as outward commerce, while it will give extraordinary activity to our transportation interests. These facts more than justify the recovery of confidence that has occurred within the circles of capital during the current year; and that restoration of confidence will give permanence to the renewal of activity that is so generally evident."

The Coquita Palm.

The Coquita palm (*Jubaea spectabilis*) is a Chilean species, but is also cultivated in New Granada and other parts of South America. It affords the *Miel-de-Palmo*, or palm honey, so much esteemed and used throughout that country. The beautiful trees are felled in great numbers yearly, and their graceful crowns of feathery leaves lopped away, to catch the sap running from the wound. By cutting a thin slice from the end every day the flow is kept up for several months. A good tree will yield 90 gallons. The sap is boiled down to the consistency of treacle, and used instead of sugar. The small nuts which the tree bears are also edible, and are exported in considerable quantities. The Chileans let their cows and oxen do the husking in a peculiar manner, as follows: The cattle are very fond of the green husks, and being allowed to feed upon them, swallow the nuts whole. Afterward, when chewing the cud, they eject the nuts, which are found in small heaps, entirely free from husks, in places where the animals have ruminated.

Extraordinary Coal-Mine Explosion.—It appears, from the report of Professor Burat, that, at the mine explosion at Frameries, more than 100,000 cubic meters of fire damp must have been evolved in a very short time. All the 200 safety-lamps (Mueseler's) were extinguished without causing ignition. The gas issuing from the shaft caught fire outside the mine (possibly from the engine-furnace), and burnt with an enormous flame. When the supply was becoming exhausted, the burning gas ran back into the interior of the mine, followed in its retreat by atmospheric air, and occasioned nine successive explosions. The whole occurrence is considered unexampled in the annals of coal-mining.—*La Correspondence Scientifique.*

The Engineer.

A Balloon Line.

Many plans have been suggested to utilize the lifting power of balloons as a means of carrying passengers over regions inaccessible by any other system of transportation. The latest plan is that proposed in a projected line of balloons run between Spanish Fort and New Lake End, in Louisiana, a railway being impracticable on account of the swampy nature of the ground.

The New Orleans *Picayune* says, that while the plan suggested is not original, so far as the principles involved are concerned, the application, however, is ingenious, being, in fact, a successful method of directing the course of the air-ship. Spiles or posts are set along the lake shore, making a complete circuit, resembling a telegraph line. Along on the top of these posts are placed guide rails of a peculiar form. Fitting these rails, and sliding freely on them, are riders or attachments, to which are made fast the guide ropes, holding and guiding the balloon, and so arranged as to brace it against the wind from any direction. Fitted in these posts are pulleys, over which is passed a wire, making a complete circuit like a belt, and gliding on the pulleys; and this rope is moved at any rate of speed by an engine stationed at a proper point in the circuit.

The balloon is made in an elliptical form, the length twice the hight, and pointed at the ends, thus giving the least surface for resistance to the atmosphere. From this, suspended by the netting which envelopes the balloon, is an iron frame, on which the car is hung by double pivots, similar to a ship's binnacle. The weight being in the car, it remains in its proper position, being braced by the guide ropes, while the float or balloon oscillates above it if moved by the wind.

The car is fitted with a grappling attachment which passes through tackle in the frame and to the car. The moving wire rope is seized by the grappling hook, and the car and float move forward, drawn by the endless rope and guided by the rudders, which slide along the rails, from which it is impossible for them to become detached. If it is necessary to stop, the grapple can be let go instantly and the car stopped. Any number of cars can be used, following each other at short intervals.

The guide ropes can be lengthened at will, and the car allowed to float at any desired hight, being under perfect control. The posts having only the weight of the guide rails, and no grading being required, it will be seen that the cost of construction is comparatively small.

This plan appears to be feasible. It remains to be seen how it will work when put in actual operation. If the attempt is successful, the aerial route will be extensively patronized. It is understood that a company is being formed to undertake the enterprise.

Tehuantepec Canal.—We are informed, by the *Iron Age*, that the work of opening the proposed inter-oceanic route across the Isthmus of Tehuantepec has actually begun. Word has just been received by the syndicate in New York who are engaged in this grand undertaking, that a corps of engineers have commenced dredging, building wharves, surveying, etc., at the mouth of the Goatzacoalcos river, which forms the harbor at the Gulf terminus of the proposed railroad. This enterprise, it will be remembered, is under the authority of a grant or concession recently obtained from the Mexican government by Mr. Edward Larned, of Pittsfield, Mass. No time has been lost in organizing for work and providing the requisite means. By the 15th of October, steel rails, a powerful steam dredge, and every necessary appliance, will be on the ground. About two months will be required to give an entrance for vessels through the bar of 24-feet draft. The grant referred to gives Mr. Larned three years in which to build, the company being bound to construct yearly a section of not less than 63 kilometers, or about 39 miles. The railroad is to start from the mouth of the Goatzacoalcos river and extend to the upper lagoon, near the Pacific ocean, whence a canal must be excavated to the western extremity of the route. The lagoon, or lake, will form a harbor, to be equipped with wharves, lighthouses, etc. The concession from the Mexican government comprises a land grant of alternate sections three miles square, and control of the harbor at the mouth of the Goatzacoalcos for 99 years; also of the lakes on the Pacific side. At the expiration of this period the road must be surrendered to the Government, the latter taking the rolling stock at one-half its appraised valuation and the track at $13,000 per mile.

Commander Cameron, of the British navy, says that the Morse system of telegraphy, as far as it depends on the length of sounds, has long been in use in Africa. He has found tribes that, by stationing drummers at intervals, carry intelligence for miles with great rapidity, the beats of the drum being made in accordance with a previous arrangement of signals.

The Italian government is about to construct a large observatory on Mt. Etna. A site has been selected at a hight of 9,652 feet above the level of the sea, near the Casa degl'Inglesi.

Useful Information.

Cheap and Seasonable Dyes.—Many barks and berries besides the following, enumerated by a German writer, will yield good and beautiful dyes. Many of the fancy inks are little else than fruits, barks or roots, treated similarly to these. The cheap and ready-made aniline dyes of the shops and stores, are, however, becoming a common and economical substitute for most of them. The German says: "A number of excellent dyes can be obtained from the berries of common plants, by boiling them in water so as to produce a strong decoction. The whortleberry and the blueberry, when boiled down, with an addition of a little alum and copperas, will make a fine shade of dark blue. The same treatment, with a solution of nutgalls added to it, will make a handsome brown; while, by adding alum, verdigris and sal ammoniac to the berries, several shades of bright purple and red can be obtained. The juice of elderberries boiled in water with a little alum will also produce a shade of blue. The berries of the privet, when over-ripe, will yield, by a mixture of a little salt, a scarlet red, and the seeds of the burning bush, when treated with sal ammoniac, make a beautiful reddish purple. The juice of the currant, with a little alum, will dye a bright shade of red; and the bark of the bush, treated in the same way, makes a good brown. Yellow can be obtained from the bark of the elm, the poplar, the ash and the apple tree, boiled down strong and mixed with alum water. The tassels of broom corn, treated in the same way, produce a good shade of green.

Snow Imitations for Parlor Ornaments. A neat parlor ornament, inexpensive and readily constructed, can easily be made by the exercise of a little taste and patience, in snow or frost imitations of fern or trees. Take the branch of a tree which is thickly studded with small leaves. They should be painted over with white glue, rather thick; then sprinkle on plaster paris, leaving it much thicker on top. The tree, or rather branch, should be upright while doing this. Put it on pretty thick. You will soon see the damp from the glue go all through the plaster paris. Let it remain until the next day when it will be sufficiently hard for the finish. Now for the secret. Get some clean alum, powder it as fine as possible in a mortar, or otherwise, and sift it through a very fine sieve or piece of coarse muslin cloth. Then get some very clear gum arabic; buy it dry, and sort out the whitest and dissolve it. It must be thick. Brush a good coat all over the plaster paris, after which sprinkle on the powdered alum as quickly as possible. When thoroughly whitened, stand it aside in a dust-proof place, and when dry blow off all the loose alum, and you will be proud of your work.

Cellular Formation of Iron.—A writer in the London (Eng.) *Journal* asserts that the "fiber" or "silky luster" exhibited in the fracture of good iron, is only the effect of the light reflected from the inner surface of myriads of minute cells exposed by the fracture, the form of which cells in the normal state is spherical, or nearly so, but becomes changed in the process of rolling. That the mechanical properties of tenacity, ductility, etc., must greatly depend on the perfection of this cell system, is argued from the fact that a crystalline, malleable iron does not show prisms in its fracture, but simply a number of faces or planes crossing the cells at right angles, cutting them off short. The process of rolling iron into plates or sheets does not obliterate these cells, but merely modifies them, as they widen out under pressure; the thin partitions become laminated, and on the regularity of this lamination the quality of the plate very much depends. The cell system of copper is more perfect than that of iron, a result of the pouring of the copper into molds; but the cells are afterward altered by the pressure in rolling, etc., but never destroyed.

Glass Shoe Patterns.—The question sometimes arises whether a patent can be obtained for the mere substitution of a special material for another in the manufacture of a well-known article. In reply, we may state that if the Patent Office is satisfied that in consequence of the substitution a new and important result is obtained, a patent will be allowed. A recent case in point is that of an applicant who asked for a patent for making shoe patterns of glass. It was alleged against the applicant that glass patterns had been previously used for cutting out photo print ovals; also that sheet metal shoe patterns were in common use; and that there could be no invention in merely substituting therefor such a well-known substance as sheet glass. But the Commissioner decided that the use of glass shoe patterns was a useful novelty, sufficient to support a patent, because such patterns enabled the cutter to see any defects in the leather and move the pattern to avoid them, which he could not do with the ordinary patterns. So the patent for glass shoe patterns was allowed.

Curved Arm Pulleys.—Formerly pulleys were cast with curved arms, with the idea that they would produce less shrinkage strain, as upon cooling they would yield or spring to the pressure, but the art of proportioning and casting pulleys has been so improved that the curved have little or no advantage over the straight arms.

Protection Against Revolving Shafts, etc.—Accidents arising from the entanglement of some portion of an operator's garments in a swiftly revolving shaft are of too frequent occurrence in large manufactories, and of a distressing or fatal nature. Many suggestions have been made from time to time to prevent, or, at least, lessen, the chances of such accidents. One of the simplest methods of rendering these casualties impossible, without introducing the necessity of constructing a railing or fender about the moving piece in dangerous places, is to cover the shaft with a loose sleeve along its entire length. This may be made of sheet tin or zinc, and to be movable if desired. It should be covered within and at the ends with leather, to prevent noise. Arranged in this manner the friction between it and the revolving shaft would be sufficient to cause the sleeve to revolve with the latter; but in the event of any decided resistance being brought to bear on it, as in case of the entanglement of a workman's garment, the sleeve would be brought to rest and permit of extraction without accident. The same idea of loose covers may be applied to cog-wheels or pulleys, and prove an invaluable protection against loss of life or injury to person.

Prickly-Pear Fibers for Matting, Etc.—During the recent scarcity, the people at Kunjpura, in the Punjaub, were driven to obtain a livelihood by the preparation of fiber from the prickly pear. The process adopted by them was to first cut off the blades at the stem, to separate each into thin strips with the hand, to tie these strips up into bundles and immerse them in water for ten days or so. This is said to be a most disagreeable task, as the effluvium given off is horrible, and the juice of the plants is so acrid that it is difficult to protect the hands and legs from it. The fibers are of a yellowish-white color, as coarse as horse hair; the material is very strong, and makes excellent ropes and matting; but, owing to its coarseness, it is with great difficulty that it can be converted into paper. White ants do not attack matting made of this fiber.

Giving a New Edge to Razors.—It is sometimes said that dipping a razor in hot water injures its edge, but the contrary is effected. A fine edge is given to steel blades by tempering, and experiment has shown that 212° of heat, or that of boiling water is the point at which razor edges are admirably tempered. Hence, by dipping a razor into boiling water it has the effect of re-tempering it, or giving it a new edge.

Good Health.

Poisoned Water.

Editors Press:—I am glad to see your correspondents waking up to the importance of seeing that their families are not poisoned in their daily drink. But we are beginning at the wrong end. Straining at the gnat and swallowing the camel. By all means see that your pipes and tanks are in good shape, and of right material; but see first that the water supply is uncontaminated. Hardly a town in California is furnished with efficient sewers, and the seepage from the disgraceful, unreformed, old-time cesspool contaminates the contents of probably half the wells in the villages. In Monterey you may find cesspool and well for drinking water in shameless juxtaposition. Still typhoid fever and diphtheria are regarded as mysterious dispositions of Providence, instead of being looked on as the natural result of damnably filthy ways of living, from which the domestic cat recoils. How many farmers have a pestiferous hog-wallow in proximity to their wells, full of stinking black mud, the seepage of which returns back to their tea-kettles? Use dry earth in your privies, and let your hogs wallow a hundred yards from your wells, and give your families a chance for health.—Ed. Berwick, Monterey, Cal.

Long Life, and how to Reach It.—This is the title of a new number of the American Health Primers, published by Lindsay & Blakiston, Philadelphia, and for sale in San Francisco by A. L. Bancroft & Co. The unusual excellence of this series deserves a large patronage. The laws of health and causes of disease are set forth in plain language, and in interesting, readable style. Speaking of the universal temptation to forget warnings against danger to health, Dr. Richardson, the author, remarks: "Experience proves that a large majority of mankind has, in every age of the world, preferred to try dangerous coasts and currents for themselves, instead of steering in the well-known track of comparative safety. We are prone to yield to the seductive temptation of finding out for ourselves how great the danger is. We are lured on to venture a trial of strength or endurance by the egotistic opinion that we, of all men, can see the evil consequences, in time to draw back and avoid them." The little book is written with a view of showing common sense facts to common sense people, and void danger to good health.

Color Blindness in Negroes.—Dr. Swan M. Burnett, of Washington, has recently made some examinations to ascertain whether the negro of the United States is affected with color blindness to the same degree as the white race. He concluded that they are less liable to the defect.

Renewing the Eye.—From recent experiments made by M. Philipeaux, a French oculist, it appears that the optic organ has the same capabilities of reconstruction as the bones. M. Philipeaux undertook to discover whether on completely emptying the eyes of young rabbits and guinea-pigs, the vitreous humor would be reorganized and whether even the crystalline would be reproduced. With this view he conducted his operations, always, of course, taking care not to touch the crystalline capsule, for experience has shown that in order for an organ to regenerate, a part of it must be left in its place. It seems that a month after the mutilation was made, M. Philipeaux was able to state that the eyes which had been emptied, were filled afresh, and that the crystalline was reconstituted. He operated on 24 animals, and in every case the mutilated eye revived. How far similar results would be obtainable with the human eye does not appear. If the same regenerating power is found to be general, a decided improvement may be possible in the treatment of certain injuries and diseases of the eye.

Raisins as a Recuperator.—It is an old story that of the Frenchman who declined to eat raisins or grapes, because he disliked taking his wine in the form of pills; but now comes Sir William Gull, Queen Victoria's physician, who declares it better, in case of fatigue from overwork, to eat raisins than resort to alcohol. In his testimony before the Lord's Commission in London, a few months ago, he affirmed "that instead of flying to alcohol, as many people do when exhausted, they might very well drink water, or they might very well take food; and they would be very much better without the alcohol." He added, as to the form of food he himself resorts to, "in case of fatigue from overwork, I would say that if I am thus fatigued, my food is very simple; *I eat the raisins instead of taking the wine.* For 30 years I have had large experience in this practice. I have recommended it to my personal friends. It is a limited experience, but I believe it is very good and true experience."

Antidote to Poison Ivy.—Dr. J. M. Ward, in the *Medical Record*, makes another addition to the already extensive list of remedies for poisoning by *Rhus radicans*, or "poison ivy." He recommends the profession to use, in all cases of poisoning by this plant, Labarraque's solution of chloride of soda. "The acid poison," he remarks, "requires an alkaline antidote, and this solution meets the indication fully. When the skin is unbroken, it may be used clear three or four times a day; or, in other cases, diluted with from three to six parts of water. After giving this remedy a trial, no one will be disposed to try anything else. It is one of the most valuable external agents known to the profession, and yet seldom appreciated and but rarely employed. It will sustain its reputation as a local application in erysipelas, burns and scalds."

Graham Bread in History.—The *Phrenological Journal* for October is authority for the historical feature of Graham bread. It says: During the administration of Wm. Pitt, in England, there was a great scarcity of wheat, and in order to make it go as far as possible, Parliament passed a law that all the bread for the army should be of unbolted wheat meal. History states that the result was such an improved condition of health among the soldiers as surprised them, and also their officers and the surgeons. The latter declared that never before were the soldiers so robust and healthy; and that disease had nearly disappeared from the army. For a long time this kind of bread was used almost exclusively, but when wheat became once more abundant, its use was discontinued.

A New Way to Treat Diphtheria.—Quite a discovery in the treatment of diphtheria has been made here. A young man, whose arm had been amputated, was attacked with diphtheria before healing took place, and instead of the matter incident to that disease being deposited in the throat, the greater portion appeared on the wounded arm, and the diphtheria was very light and easily managed. Dr. Davis, of Mankato, profited by this, and in his next case of diphtheria blistered his patient's chest, and on this blistered part the chief deposits appeared. This was also an easy case of the disease. The theory of Dr. Davis is that diphtheria usually appears in the throat because of the thinner lining of the throat. Hence, when the blister breaks the skin upon any other part of the body, the disease appears there.—*Minnesota Letter.*

Tape Worms in Eggs.—Various instances have been recorded of the discovery in hens' eggs of minute specimens of the *Distoma ovatum.* They appear like a small speck, the size of a millet seed or a pin's head. It is believed by helminthologists that these will develop into one of the varieties of tape worm, and it is wise, therefore, to take eggs hard boiled or otherwise well cooked. A writer in one of the late numbers of *Nature* cites several instances where these parasitic bodies have been found.

A Cause of Yellow Fever in Memphis.—It has been suggested that one of the causes of yellow fever in Memphis is its wood pavements. There are many miles of it in a state of decay—indeed, so rotten and honey-combed as to make them cesspools for the retention of street filth, and where noxious gases are generated that keep the air foul in hot weather by night and by day.

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The Week.

Increased activity in prospecting resulting in new developments has been the marked feature of the present week. Judging by reports from the Mohave river, the mountaine north of San Bernardino contain rich ledges of silver ore. In Mariposa county, mines that have remained idle for yeare are now in the bands of parties who propose to work them with a profit. New and promising ledges of free milling gold ore have been discovered in Lassen county. Rich gravel claims, combined with quartz ledges of unusual size and value, are now being worked in Sierra county. One 50-foot ledge of rock of an unknown quality assayed very rich in gold and platinum. In all the region about Milton the indications are extremely favorable for a rich harvest of yellow metal. Within the Glenbrook racecourse enclosure, near Grass Valley, in Nevada county, a quartz ledge has been struck which prospects fairly in gold. The mines of Amador county are now working to good advantage, come of them having been started up lately after a long period of idleness, and in others new machinery is being put up. All over California, even in unlooked-for localities, energetic and persistent prospecting has reaped just rewards.

Nevada, in relation to the quantity and quality of new discoveries, shows the same evidences of improved mining activity as California. In fact all of the Rocky mountain mining region is fast developing into an active mining business so fruitful as the foundation of solid wealth and prosperity, as speculation has heretofore been a mockery and a hollow delusion.

GOLD has been discovered near Kansas City which runs nine ounces to the ton. A company has taken hold of the discovery and is making arrangements for erecting machinery to work the ore.

Public Sentiment Against It.

While a few of our leading interests are tolerably prosperous and certain branches of business have of late improved somewhat, there is still a great complaint of hard times among the masses in California. Most of our manufacturing and mechanical industries are depressed, labor o nearly every kind is in excess of demand, even at reduced prices, real estate is low, and few improvements are in progress—not that the creation of material wealth has with us been arrested, or even at all restricted. On the contrary, we have made of all our leading staples —gold and silver, wheat, wool, wine, etc.—a large production. But, somehow or another, the proceeds of these commodities have not been generally diffused throughout the community. They seem, indeed, by some mysterious process to have been steadily wrested from the hands of the toiling many, and been aggregated in the hands of the non-producing few.

If now the reader will take it upon him to inquire of the next 10 or 20 intelligent men he may chance to meet what in their estimation are the causes of this untoward and anomalous state of things, we venture the assertion that every one of them, unless biased by interest, will include the practice of dealing in mining stocks among the causes, if, in fact, they do not assign this as the principal one. In other words, it is the sense of all intelligent men whose opinions are judicially entitled to any weight, that this business constitutes one of the most potent factors of the industrial stagnation and financial distress that to-day afflicts our people, beside being a source of much crime and an infinite amount of physical suffering and social mischief.

We even go further. We hazard the opinion that there is not a manipulator of the mining share market who will justify the business in which he is engaged on any other than that mankind, being natural gamblers, are bound to indulge this propensity, and may therefore as well stake their money on the turn of the stock market as on the turn of a roulette wheel or the turn of a playing card. It is difficult to find a man, however deeply immersed in the business, who will not readily admit its baneful tendencies, pleading only this universal infirmity of our kind in its defense.

Now the question arises, how long is a business likely to be sustained after it has come to be almost unanimously condemned as demoralizing and dangerous by the community upon which it is dependent for its support. Consulting our reason, we would say not very long; consulting experience, we are prepared to admit that it may, in the absence of restrictive measures, be continued for a great many years. Lotteries flourished for centuries after their pernicious effects were everywhere felt and admitted, it being less than 50 years since the schemes for fleecing the weak and credulous of all classes were suppressed by law, a policy that has met with adoption only in countries where the public judgment is enlightened and the public conscience is especially sensitive. In California, gambling, tolerated from the first, was openly carried on for a good while after it had become utterly obnoxious to the popular feeling, its suppression by statute having been effected less than 20 years ago.

As to the expediency of restraining or entirely prohibiting stock operations by legal enactments, our ablest jurists are not agreed, some arguing in favor of repressive measures, while others incline to the belief that the evil, if let alone, will naturally cure itself, holding, moreover, that nothing short of an unwarranted interference with individual rights would suffice to put a stop to this species of gambling. Evidently, public sentiment would not as yet sustain any very stringent legislation on this subject, and perhaps it is as well to let the thing run in the hope that it will ultimately wear itself out.

Of late the disposition to invest in this class of so-called securities has undergone considerable abatement; but whether this comes from any widespread conviction of the impolicy of the business, or from the little encouragement given dabblers in stocks, it is hard to say. Certain it is that the better class of operators are retiring from the field, which is in danger of being left to the occupancy of the very large and very small, or rather very desperate, class of dealers. Indeed, the calling seems for some time past to have resolved itself into a mere lying-in-wait for the simple and unwary. The utmost ingenuity of the craft has been required to keep their victims from letting go in despair. The most puerile excuses have been invented for explaining the continuance of low prices and postponement of the long-promised "boom" in the market. The last of these was the arrival of General Grant. When he came then prices were to jump up, sales were to take place, and everything be lovely. What is to be thought of a pursuit that has to resort to such means as these to prolong its hold on the popular confidence? Is it not time that all honorable, self-respecting men should withdraw from a business that is even susceptible of deriving aid from a pitiful dodge like this? How in the name of common sense was an event so wholly irrelevant as the advent of any man on this coast to affect the market for mining shares one way or the other?

Improved Patent Laws.

The prominent position assumed by American manufactures and arts, particularly in the domain of the mechanical, during the past decade, has excited much inquiry among foreigners into the workings of a system which has produced such fruitful results. That the success of American inventions is, and their admitted standard of excellence has been due to the stimulus produced by well regulated patent laws, cannot be doubted. There is nothing sluggish in the mind of the American inventor, and the restless activity of his genius aided by comparatively perfect and cheap protective laws, has brought about a condition of things the magnitude of which the European heretofore has not been able to fully comprehend. The English, German and French genius is not naturally sluggish, for we can point to those of that nationality living in the United States who have become so imbued with the spirit of our institutions as to become so to speak "thoroughly American." We cannot, in fact, make any distinction in this country between nationalities. It is the better understood capacities of human nature, and laws calculated to bring out and develop genius which has accomplished a unification of nations as it were, and established a common standard of intellectuality.

On their native soil, however, the condition of things has been and still is adverse to the development and protection of mechanical genius, and in exceptional cases has forced the utilitarian ideas of the people into the domain of the psychological, the mystical. In these departments the palm must be accorded them. A revolution in ideas is, however, occurring in the governing powers of these nations, and learned writers are beginning to see that the practical development of nationality is due more to the advantages accorded material progress, than those which have been heretofore awarded to literature and *belles lettres*.

In England the heory of the patent laws is, to a great extent, founded upon the benefits accruing to the crown upon the exercise of the royal prerogative which grants the monopoly. The expense is heavy, and calculated to destroy rather than nourish the fires of genius that cannot brook control. In France the system has been somewhat broader in extending its benefits to the inventor, still retaining, however, the idea that the Government has bestowed upon the inventor a privilege as distinguished from protection only. In the United States the main idea is that the inventor of any new and useful device is conferring a benefit upon the nation, and should, therefore, be protected in his invention.

This is the correct theory, because it has succeeded in producing such astonishing results that other nations are gradually adopting it. A strong effort is being made to abolish the doctrine that whatever franchises are granted by Government are granted purely voluntarily and by virtue of the exercise of a gracious prerogative. Public policy has been no element in the granting of a patent, and the only other element of any advantage to the inventor, encouragement, wholly disregarded. Royalty has been jealous of parting with its abstract rights as granted it by the *doctrinaires* of an impractical age.

England is seriously contemplating an entire change of front in regard to the policy of her patent laws, induced, no doubt, by the reaction that has set in against the policy she has always adhered to. Under the English system it is not necessary to be an *inventor* to obtain a patent—the *first introducer* receives the reward due the discoverer in some other nation. It is, substantially, a reward offered to theft. The idea was, doubtless, good in theory, but disastrous practically, as was discovered not long ago, in the case of the English patent rock-drill, which was introduced in Japan and there found a copyist in an ingenious native, and the English invention was abandoned for the use of the home-made machine. This practical result of their own policy has opened the eyes of English manufacturers to the glaring defects in their patent system, and we may look for a speedy change in the whole, for when once the wedge of improvement has been inserted, ancient customs and ideas must give way to modern utilitarian ideas.

Germany is stirring to improve her patent laws, but they still contain many defects apparent to an American, particularly in the hampering restriction of compulsory working of patents within three years or revocation. Many applications have been refused on the ground that the German law prohibits the grant of a patent a description of which has been published in the *Official Gazette* of the United States—a course which must enure to the hardship of American inventors, but there is no other way than for inventors to shape their course accordingly. The German patent office, not being alone self-sustaining, the fees are high; but it is said that the receipts are now exceeding the expenditures, and a reduction of fees to a reasonable limit will soon be made.

As to the compulsory working of patents, experience in Belgium, France and Austria has shown it to be unjust, and the enforcement of the law in that respect practically abandoned, except in Germany.

Dr. Malapert, Advocate of the French Court of Appeals, in a new commentary on the patent laws of France, substantially adopts the American idea of protection being due to the inventor, both as an encouragement and as a recompense for the benefit accruing to the public at large after the expiration of the patent; but seems unwilling to declare that the protection accorded the inventor possesses an absolute property in the practical results of his new ideas.

The subject of patents, on account of the great attention paid to it at the present time, will receive a close investigation, and the adoption of a nearly perfect system for the regulation of this peculiar species of property follow.

Scientific Researches.

As the world grows older, the scientific theories promulgated become more numerous. Sometimes a new doctrine is built upon the discovery of some ancient remain, ordinarily termed "pre-historic," because the finder cannot ascertain its origin, or built upon that most deceitful of scientific standpoints, analogy. Some years ago, the supposed remains of a Chinese junk were alleged to have been found near the summit of the Sierras. This furnished food for proof that the waters of the ocean once laved the mountains, for otherwise how could the junk have got there. It also proved that the Chinese had visited this slope long before the present race. There was nothing surprising about either of these deductions, since a critical examination has demonstrated that this coast was at one time submerged beneath the waters of the Pacific, and the annals of the Chinese empire, in the Tong-kien-kang-mon allege that the Chinese visited America in the 4th and 5th centuries. The remains of ancient unknown races and their shell implements are said to be scattered all along the Pacific coast from Alaska to and including Oregon, which latter State seems to have been, however, the favorite habitation for these "pre-historic" races. Only a few weeks ago, a miner discovered, in a hill, on the south fork of Sixes river in Oregon, and in a new and unworked mining region, an old, worn pick, of awkward pattern, and a small coin the size of a dime, composed of gold and copper and of unknown nationality.

The traditionary Atlantis is made the basis of the theory of a race of intellectual giants, prosperous and happy, dwelling upon a portion of the American continent, reaching out into the the Atlantic ocean, of which Madeira, the Azores and the West India Islands are the sole remnants, all swallowed up in some fearful catastrophe. Central and South America contain fruitful evidences of an unknown, extinct and highly intellectual race, as judged by the ruins remaining. In the canyons of the Colorado, beyond the reach of ordinary warlike tribes, are found the ruins of habitations built by cliff-dwellers, with here and there descendants of the same race, still dwelling in the primitive manner of their ancestors, but possessing few traditions. In the copper region of Lake Superior, buried beneath what are termed the *debris* of ages, are found evidences of ancient mining. The ancient mound builders, the lake dwellers of Switzerland, and numerous interesting and inexplicable evidences of ancient races are relegated to the dim, misty ages of the past, until our learning in this direction has apparently assumed the shape of legendary lore, and our antiquarians unwittingly fallen into the habits of reasoning peculiar to ancient races.

Whatever is ancient possesses peculiar charms to the mind engaged in antiquarian researches, and exaggerates the capacity that produced the relic into a monument of wisdom or of engineering skill. We can see that all the well concocted theories built upon a bone, a shell, or an old wall, lead to the utter destruction of the theory of evolution, as exemplified particularly in the doctrine of the survival of the fittest, since to discover in the ages of the past superior races, or even equal races, is to assert the deterioration of present races.

Vast changes are occurring upon the surface of the earth even in our day. Mines and mining appliances, well known to exist 30 years ago, are now buried 100 feet beneath the accumulated debris deposited by the hand of man. And shall not nature accomplish by her limitless power far more? What was swallowed up in the cataclysm of 1852 in Tuolumne county, where of what was once a well-peopled region is now a broad lake? What antiquarian of next year will find therein the pick of some modern miner, the shell coin of the Miwok Indians, or the remains of an arastra, and build up fanciful theories of some highly intelligent ancient race? It may be done, and done easily.

Landslides, sudden torrents, and volcanic action of comparatively recent occurrence, but ancient look, cover mountains deep, the remnants, relics and evidences of modern races, habitations and implements, in which the future scientist, now "cramming" in our infant schools, will find food for a splendidly written theme on "pre-historic" remains.

TELEPHONES FOR RAILROADS.—The telephone seems to have become an almost indispensable aid in the operation of railways. The Pittsburg Southern, a narrow-gauge line of 36 miles, is said to have discarded the telegraph and adopted the telephone as a means of communication both for general business and for running trains. The possibilities of this wonderful instrument have only begun to be realized.

The Colorado River Country.

At the meeting of the Academy of Sciences on Monday evening, Major J. W. Powell, of the U. S. Geological Survey, well known as a scientist and explorer, addressed the meeting on the subject of his explorations in the Colorado River country. His highly interesting report on this subject, published a few years since, brought into prominent notice the wonderful features of the region he describes—a region with such marked peculiarities and characteristics as to have attracted the attention of the whole world to its wonders. Although called upon without opportunity for preparation or being provided with notes, Major Powell entertained the Academy for over an hour, with an account of the Colorado region, its geological features, peculiarities, habits of the Pueblo Indians, etc. His manner of speaking is as eloquent as his style of writing is graceful, and the Academy have seldom been entertained as they were by this noted explorer.

The great Colorado river, for nearly 1,000 miles, is not approachable from above. No human industry could thrive; there are no farms, no habitations. The river has carried a vast amount of sediment. The valley of the Colorado is a region of naked rocks, where the strata can be measured with accuracy, where geological studies can be made with an approach to certainty of conclusions. It is an open book, a book of Revelations. We are able now to state with accuracy the amount of material carried off by the river. This amount would average over the whole area a *depth*, or thickness, of 5,000 feet. A rock as large as the combined States of California and Nevada, and 5,000 feet thick, has been washed away by the storms which have beat upon it, moved it into the river, and the river has carried it away.

Where there has been 1,000 feet of sedimentation, there has been 1,000 feet of degradation in some locality. In the valley of the Colorado, we are able to study the results of the erosion or degradation. These studies have resulted in bringing out interesting facts in dynamical geology. One of these facts is that in this valley the rivers are older than the mountains. The river winds its way over a region of country, carving its channel, cutting its channel deeper and deeper. As the mountains rise, the river cuts its channel through like a saw through a log which is fed to it. Hundreds of instances prove this.

The subject of transportation of material by rivers is a study which is an open book in the Valley of the Colorado. In 1869, I passed through the Grand canyon, and said that the courses of rivers were never determined by factors of strata; but all this is n faulted region. We find the folds in the valley of the Colorado broken by faults. The displacement in these faults is often very great—ten, twelve, fifteen or twenty thousand feet. In the Wasatch mountains, a fault running north and south has been traced 400 miles. In the plateau region, we find simple faults, great blocks, 20 or 30 inches wide, lifted up. There are 11 great faults across the valley of the Colorado. One block dips down, another is lifted up, or *vice versa*. The structure of the country is displacement by faults. The strata are horizontal. Besides this general structure we find another interesting feature. We find a zone, or belt, of rocks broken into irregular fragments, some blocks tipped one way and some another, on their edges or on their ends, like blocks of ice in a river. We find these zones of broken or irregular rocks, 10, 12, 20, and 30 or 40 miles long. No dynamical theory of a contracting earth explains this structure.

The ride through the Colorado was interesting to us studying geology. When we reached the head of the Grand canyon, our boats were injured. The Grand canyon has its base in granite, and there is generally 1,000 feet of granite rocks, and then carboniferous rocks. We found that the rapids were caused by the granite; that wherever we came to granite the passage was bad. When we came to a fault of sandstone the river would be half a mile or more wide, or at least 200 or 300 yards; but when granite or basalt was reached, it would narrow down to 60 or 70 feet. In this narrow, confined space, as much water as the Ohio river carries will rush and roar down in a mad, wild stream. In the sandstone or shale it opens out broadly. At high water the river fills its channel from wall to wall, and there are no landing places. The difference between high and low water is very great. The river drains an immense region. There are thousands of springs and streams, the waters from which tumble down over the rocks in every direction. In a single great storm, the river will rise twenty, thirty, or even a hundred feet.

At high water the river runs with such irresistible force that oars were of no use, and the boat would sweep along at an alarming and dangerous speed. We found it advisable to travel on the low water, making portages where necessary.

All the falls or rapids are caused by one of two reasons; either the walls have tumbled down and the broken rocks caused them, or else a side channel coming in had washed material into the river bed.

I went down the length of the river in a boat, and there is not a single vertical fall in the whole distance. And here I may mention certain facts, which I have not before made public, concerning the formation of falls, and which my observation proves to me conclusively. A fall on the river is an exception. A vertical fall needs always an *excavation*. The Colorado river cuts its own channel, and carves it out so that there can be no fall unless there is some extraordinary circumstance to produce it. It takes two things to produce a fall. One may be a "fault," but here it will not last long—geologically speaking—for the stream will soon wear it away. Or, when a river is somewhat rapid and some strata are hard and some soft. In either case the lower one will be undermined farther than the upper.

Now we know before we started that the Colorado river had to descend 5,000 feet in its course. Geologists said we would assuredly find an immense fall somewhere; or else a series of falls. After exploring the Green and White rivers I concluded that since the Colorado must carry an immense amount of sediment, it would be impossible for it to have many vertical falls. I had faith that there were none. In all the tributaries carrying sediment, there was a very rapid current but no fall. The sediment will wear away the upper strata before the under are undermined, even if the upper are harder.

The Valley of the Colorado has been the home of a Pueblo building people. In the Uintah mountains are thousands of ruins, some of them very ancient and deeply buried. The whole of

CLIFF DWELLINGS OF THE COLORADO.

the region has been inhabited by people who built houses of two, four, five, six and seven stories in hight, and who cultivated the soil to some extent. The Pueblo Indians of to-day are a portion of the same people, allied by their arts only, but with a wide separation in respect to language. There are four distinct stocks of Pueblo language in the United States now.

These people have covered a wide area with their ruins. North, and away west toward the Uintah mountains; east toward the Park mountains of Colorado; about the heads of all the streams piercing the Colorado we find very ancient ruins buried under the drifting sands. As we go down towards the Colorado river, the ruins become more recent. When we come to the deep canyons and high cliffs we find houses three, four and five stories high yet remaining. In the earlier parts of their history they built at the outer part of the valley and heads of the rivers. Here they were probably molested by nomadic tribes, and finally sought safety in the walls of the canyons themselves. The cliff houses do not constitute a distinct style of architecture for the Pueblos, but are much the same style as those built earlier, with a construction and site, however, more specially for defence. The nomadic tribes drove them from the perimeter of the great basin to the river. The Pueblos of to-day are fragments of this ancient people.

The form of axe or hatchet shown here this evening from Tulare lake is one we frequently find. What are here found and called arrowheads, I have often seen among the Pueblos, in use as knives, having wooden handles. The Utes of Utah, the Shoshonee and Sioux all have these stone knives, which we commonly call their spear-heads. As far as my 20 years' experience among Indians goes, I never saw a stone arrow-head. I have always seen them of bone. What we call spear-heads are really their knives. At Santa Barbara they have opened lots of graves and mounds, and have found numbers of these implements such as we call spear-heads, but many of them have wooden handles yet preserved, these handles being five or six inches long, so that what I have observed has been proved true by these graves. The Indians of Southern California and Utah use a peculiar gum for securing the handles and knives. I found it in graves as far north as Oregon.

The pottery of the Colorado country is very interesting. The most peculiar feature, however, is the picture writing. This art was very highly developed among the Pueblos. The cliffs and rocks are covered in every direction with painted figures, etc. In one wild canyon in northern Arizona, the face of the sandstone cliffs for 14 miles is almost an uninterrupted series of pictures. Several of the incidents indicated in this picture-writing I find confirmed in the Buckingham Smith manuscript in the Smithsonian Institution, which is some 300 years old.

When man lives in a primitive condition his wants are few. The families live on small pieces of ground and raise corn. There is very little game and no fish, the river being too low down between the cliffs. In this country, where there is only an annual snowfall of four or five inches, they still raise their corn in the drifting sands. They dig a hole twenty inches or two feet deep, and plant the corn in them, the hills being ten or twelve feet apart. They succeed very well. The corn scarcely reaches ten inches above the ground, while it is two or three feet to the bottom of the root. They bake their cornbread very nicely. In a corner of the house is a little oven, with a pottery pipe to lead off the smoke, and a flat hearth on which to bake. The oven is about eighteen inches square. The corn is ground and made into a sort of dough or batter. The woman takes a handful of this, and spreads it deftly over a stone in a thin film or sheet, like a sheet of paper. This is instantly lifted off and another substituted, until there are seven cooked and laid one upon the other. These seven sheets are then folded into a loaf. They are very particular as to the colors of the corn; that is, in separating the red, blue or white ears; and the head made of these ears is separated also. The chief source of subsistence of these Indians is agriculture, as will be seen from what has been stated.

THE Western Union Telegraph Company has made another reduction in its tariff, to take effect Nov. 1st, rates from San Francisco to Eastern cities will be $2,

The Jeannette in Polar Waters.

It may be safely presumed that by this time the *Jeannette* is fully on her way to her destination, the North Pole. As early as August 27th last, her course was shaped for Cape Serdez Kamen, 67° north, 172° west, to learn particulars concerning Nordenskjold, who was supposed to be frozen in at Kolintchin bay, news of the coming out of Nordenskjold not having been received at that date; thence her course was to be directed to Wrangel Land direct. Everything so far has been favorable to the success of the expedition. The *Jeannette* has proved a better sea boat than was anticipated, and the Kuro Siwa flowing in through Behring's straits has assisted her speed. The officers and crew at the date named were in excellent health and spirits. Indeed, the weather has been exceptionally fine and warm, and no ice except the old land ice of last winter clinging to the shore line and every prospect of open water in the Arctic. Up to the 27th August there was no necessity for fur clothing, the temperature even at night not exceeding 35°. The scientific work has not been neglected, and everything that could aid in the gathering of information has been done.

The *Jeannette* has progressed thus far without molestation on the part of Arctic difficulties, and has advanced much further than she could possibly have done at this season of the year had she gone by the eastern route.

This coast has a particular interest in this expedition, inasmuch as San Francisco may be regarded as its home port, and is the first to undertake the attack upon the North Pole through Behring's straits upon the theory of the inflowing Japanese current. It would certainly seem as if success must crown the effort made, because it is so much in accordance with the natural theory that a warm inflowing current like the Kuro Siwa must create an impression upon the ice floes and packs, which on the east are so compact from the never-ending ice-cold polar current flowing out in that direction.

It is hardly to be expected, however, that we shall receive any further communication from the steamer except through entirely accidental sources. From Wrangel Land, which is the last point of civilization in the Arctic, we may receive accounts of her arrival and departure, but that will probably be all. Imagination alone can trace her course towards the settlement of the many questions, shrouded in mystery by the inaccessible region to which all the energies of officers and crew are devoted. Is the north pole the birthplace of storms, or the home of a tremendous volcano? Will Symmes' theory of an opening into the earth be confirmed, or will it all end in the knowledge only of an impenetrable ice barrier? We can do nothing but wait.

Cave Dwellers of America.

The remarkable discoveries that have been made within the past few years connected with the age and origin of the cave or cliff dwellers of America, have been the continual source of much speculation. Southwestern Colorado has seemed to be the location of the most complete discoveries, particularly along the Rio Las Animas and San Juan. The Valley of the Mancos is filled with mounds which appear to demonstrate the existence of numerous villages, from the San Luis valley in Colorado in a continual chain to Mexico. The ruins of these ancient people are found in such various stages of perfection, from the small rock-cut chamber to the massive and imposing structures, indicating the work of different ages, as to afford Senor Altamirano proofs that the Aztecs originated in unsubmerged parts of America, and were as old as the Asiatics themselves, and that Asia may even have been peopled from this country.

Major Powell, however, in another column, sees in these various forms of structure only evidences of the same race building under the different conditions of peace or war. E. T. Elliott discovered and examined in December, 1877, about 12 or 15 of the houses or caves near Del Norte, many of them, especially those along the face of the cliffs, have nearly disappeared from the effects of the disintegration of the rocks. Mr. Elliott says that as no human remains have been found, nor any semblance of graves, it is probable that cremation was practiced.

It is evident from appearances and surroundings that these caves were inhabited during the period when the San Luis valley was an immense lake or sea. The valley is 7,000 feet above the ocean, and the natural inference is that most of the continent at that time was under water, which hypothesis would preclude the idea of their reaching Colorado from Asia.

THE Philadelphia papers say there seems no limit to the rise in the iron market there. Manufacturers have a call for all the structural iron they can furnish, and orders cannot be placed except in advance. Plate and tank iron is so largely sold ahead that contracts cannot be made for fear of an advance in the price of material, rates having gone up half a cent per pound during the week.

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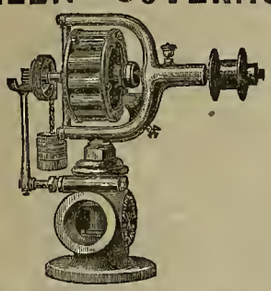

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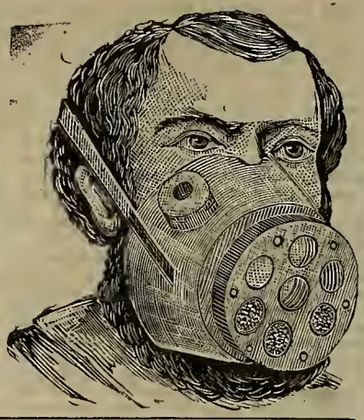

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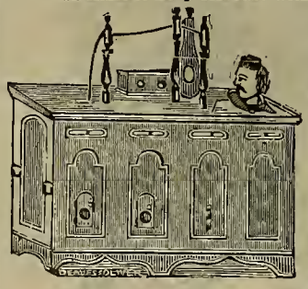
Treatment by a Purely Scientific and Rational Method Without Drugs of any Kind.

THE TREATMENT DEPARTMENT EMBRACES ALL APPROVED REMEDIAL AGENTS, AS OXYGEN INHALATIONS, VACUUM TREATMENT, THERMO-ELECTRIC, TURCO-AMERICAN, ELECTRO-MAGNETIC, GALVANO-CHEMICAL, STEAM, VAPOR, WARM AIR, AND ALL FORMS OF WATER BATHS;

Swedish Movements, The Health Lift, Spirometer or Lung Strengthener, Steam Atomizers, all Electric, Galvanic and Surgical Appliances, Sun Baths, and Solar Ray Surgery, new and perfect Truss for the Radical Cure of Hernia, lately discovered Chemical Compound for the speedy, safe, painless and permanent removal of Cancers, Scientific and successful method for the Cure of Piles, etc., etc.

☞Aims to keep Abreast with, if not in Advance of the Progressive Age.☜



It has been the mission of this System to mold public sentiment and this Institution will hope to be no disgrace to the immortal name it has assumed. The time has come when Physicians of this School can afford financially to keep a conscience; in fact it is disastrous financially as well as morally to compromise the truth one iota; hence patients can rest assured that they will be treated by the Physicians after the most approved and scientific methods, out of pure and enlightened selfishness, recognizing the truth and beauty of this great principle:

"*The Universe is so ordered and arranged that the real and permanent good of every creature is best subserved in promoting the real and permanent good of every other being.*"

THE BOARDING DEPARTMENT.

The table will be supplied with the best the excelsior market of the world affords, embracing fruits, grains, vegetables, meats, fish, fowl, eggs, cream, etc. Regular and transient boarders will be accommodated as well as patients. Business and professional men and women who are tired of restaurant fare, may appreciate eating to live a more healthful and enjoyable life. Pure food means pure blood. Pure blood means good health.

"The vegetarian school has demonstrated beyond the possibility of a doubt that farinaceous dishes, sweet milk and fruit, are sufficient to maintain a *hard working* man in perfect health. Such a diet might certainly be substituted by sedentary people for their greasy steaks and ragouts.—*Popular Science Monthly, December, 1878.*

The Rooms are pleasant, warm, well ventilated and sunny; convenient to treatment rooms, so as to afford the best advantage of nursing and professional attendance.

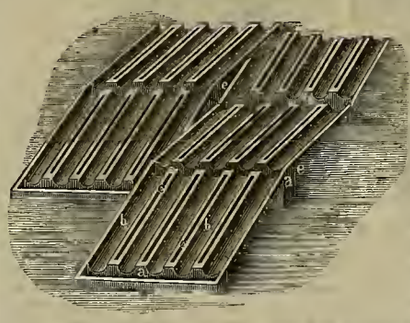
GENERAL PRACTICE.

Fevers, and in fact all cases may be treated at home successfully. Paturition confinement cases are taken in the Institution or attended at home in any part of the city or country. Preparatory treatment in these cases is most important.

Testimonials of extraordinary cases and cures can be seen on application. The most desperate cases, and especially those that have been given up as incurable by the old methods, are invited. Puerperal and typhoid fever and diphtheria cases, after all other methods have failed, may be said to be a specialty. ☞Send for the TRALL HEALTH JOURNAL.

DRS. D. C. & MRS. E. D. MOORE,
Trall Hygienic Sanitarium, 8 Ellis St. S. F.

Howland's Under-current, Mill and Sluice Riffle.



This invention meets a want which has long been felt by Gravel Miners and Millmen, viz.: that of a simple, cheap Riffle which will save the largest possible amount of gold or sulphurets, with the least possible waste of quicksilver. That this Riffle answers all these conditions will be apparent to any practical man who takes the trouble to examine it. The arrangement of this Riffle is such that there is a strong, unobstructed upper-current to carry off and break up the gravel or cement, and a slow under-current, checked by numerous riffles, which give gold or sulphurets a better opportunity of settling than if they were exposed to the force of the main current.

In this Riffle there are cast troughs for the quicksilver, which extend entirely across the sluice, and while they are so placed that the current will naturally pitch towards them, and give every opportunity for amalgamation, the quicksilver is fully protected from flouring or leakage. There is no mechanical skill required in taking out or replacing the sections.

Full particulars in regard to this invention can be obtained by applying to

STEIGER & KERR, of the Occidental Foundry, 137 First St., S. F.,

Who have the sole right of manufacturing this Riffle, and who will receive and attend to all orders.

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FRANCIS SMITH & CO.,

Manufacturers of

THE PATENT CHANNEL IRON WHEELBARROWS.

THE STRONGEST BARROW MADE. These Barrows are made by Superior Workmen, and of the best material. All sizes kept constantly on hand.

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Lap-Welded Pipe, all Sizes, from Three to Six Inches. Artesian Well Pipe. Also, Galvanized Iron Boilers, from 25 to 100 Gallons.

Iron Cut, Punched, and Formed for making Pipe on ground, where required. All kinds of Tools supplied for making Pipes. Estimates given when required. Are prepared for coating all size of Pipes with a composition of Coal Tar and Asphaltum.

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Patented March 18th, 1879. Will precipitate with steam in three hours, requiring no machinery to run it. Cost of constructing apparatus, $75. The old cylinder process takes four hours to precipitate and costs from $1,200 to $1,500 to construct, besides the machinery to run it. For right to use my Precipitator address O. O. BITNER, Spenceville, Nevada County, California.

SPECIMENS.

CHOICE SPECIMENS of Quartz showing native Gold, Copper, Galena or Iron Sulphates, Pyrites or Clusters of Crystals, or Petrified Wood sent, postage paid, on receipt of $1. Address E. O. CRANE,
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THE BEST soap for toilet use ever manufactured. BEST because it contains all the excellencies of the most expensive foreign or American soaps without their defects. BEST because it combines strength with delicacy in such a way that its strong detersive qualities do not injure the skin. BEST because it is the result of years of study and experiment in the soap manufacturing business, assisted by modern chemical discoveries. BEST because it contains ingredients beneficial to the skin, which unite chemically with the soap in such a manner as to increase its saponaceous qualities. Every chemist familiar with soap manufacture knows that some ingredients which are in themselves beneficial to the skin cannot be saponified; some are partially neutralized, while others injure the quality of the soap. There are soaps in the market which are to some extent beneficial to the skin, but they are inferior articles for toilet use. PHOSPHATE SOAP is the ONLY article offered to the public which combines all the best elements of toilet soap with medical ingredients beneficial to the skin.

If your wife is in the habit of using cosmetics of any kind, advise her to give up the pernicious practice, as the most harmless face powders obstruct the pores of the skin and sooner or later injure the complexion, while PHOSPHATE SOAP removes all impurities and assists nature in developing a natural, healthy and beautiful skin.

It is an old proverb that an ounce of preventive is better than a pound of cure. Twenty-five cents invested in a cake of PHOSPHATE SOAP will save hundreds of dollars in doctors' bills. It acts as a constant disinfectant, preventing Salt Rheum and other skin diseases.

If your wife will persist in the use of cosmetics, buy her a cake of PHOSPHATE SOAP and tell her to use it every night before retiring. In that way much of the harm will be avoided, as the skin will thereby be able to retain much of its natural vigor and beauty.

No salve or ointment can heal a wound or sore of any kind. Every educated physician will tell you that nature alone can do this. PHOSPHATE SOAP, by its cleansing, soothing and purifying qualities, gives nature a chance to act freely.

Natural beauty surpasses anything which can be imparted by artificial means. PHOSPHATE SOAP gives health to the skin simply by removing impurities and eradicating the poisons which give rise to skin diseases.

Not only for daily use on the face and hands, but for bathing the entire body, there is nothing equal to PHOSPHATE SOAP. It is a thorough disinfectant and removes offensive odors of every kind.

Ladies who have injured the skin by the constant use of cosmetics may do much to restore their faces to that beauty which nature alone can give by constantly using PHOSPHATE SOAP.

For all diseases of the skin use PHOSPHATE SOAP. There is nothing like it for removing impurities and giving the skin a healthy and natural vigor.

Cheap toilet soaps manufactured from rancid and refuse grease injure the skin and are really more expensive than PHOSPHATE SOAP, which retails for 25 cents per cake.

Thousands of articles are palmed off on the public which have no genuine merit, but PHOSPHATE SOAP is the result of modern discoveries of celebrated chemists.

PHOSPHATE SOAP costs no more than other good toilet soaps, while its medicinal qualities make it worth ten times its price to every man, woman and child.

If you want a nice article of Toilet Soap and something that is beneficial to the skin, buy PHOSPHATE SOAP.

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Nevada Metallurgical Works,

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Ores worked by any process.
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Plans furnished for the most suitable process for working Ores.
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Also, to our large and well adapted stock of

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Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast.
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Mining Engineers and Metallurgists

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SAN FRANCISCO, CAL.

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G. F. DEETKEN - - - Manager.
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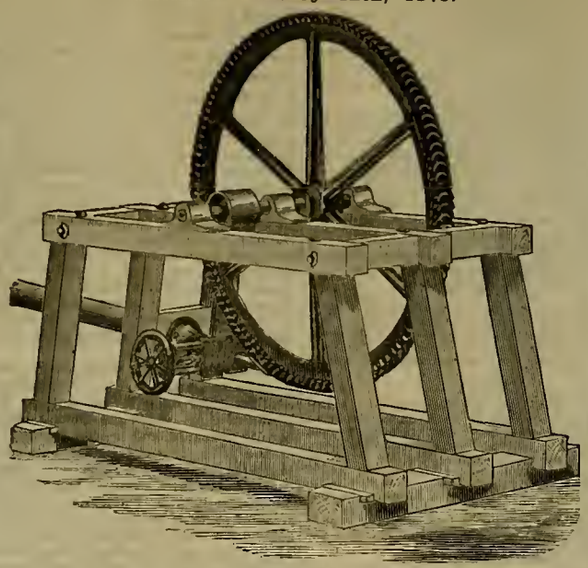
THURLOW BLOCK,
Room 38, 126 Kearny St., Cor. Sutter, San Francisco.

Coats of Arms, Crests, Monograms and Masonic Inscriptions Carefully Engraved.

Knight's Water Wheel,

Patented January 12th, 1875.

This Wheel possesses more power for given percentage of Water than any yet offered to the public. They are in practical use in many Mills and Hoisting Works, and never fail to give entire satisfaction, which facts speak fully for their efficiency, and render further comment unnecessary.



This Wheel possesses more power for a given percentage of Water than any yet offered to the public. They are in practical use in many Mills and Hoisting Works, and never fail to give entire satisfaction, which facts speak fully for their efficiency, and render further comment unnecessary.

The KNIGHT WHEEL is used in the following named Mills and Hoisting Works, to which the Public are referred:

1-Eight-foot wheel, running Oneida Co.'s Mill, Amador county, Cal.; 60 stamps. Rob't Robinson, Supt.
1-Eight-foot wheel, running Con. Amador Mining Co.'s Mill, Amador county, Cal.; 40 stamps and two Hepburn pans. David Davis, Supt.
1-Eight-foot wheel, running Lincoln Gold Mining Co.'s Mill, Amador County, Cal.; 40 stamps.
1-Eight-foot wheel running pump at same company's mine. S. D. R. Stewart, Supt.
1-Eight-foot wheel, running Keystone Con. Mining Co.'s Mill, Amador county, Cal.; 40 stamps.
2-Four and one-half foot wheels, used in hoisting by reversible water power at same company's mine. O. C. Hewitt, Supt.
1-Four and one-half foot wheel, running Original Co.'s Mill, Amador County, Cal.; 40 stamps, one pan, one rock-breaker. J. R. Johns, Supt.
1-Four-foot wheel, running Gover Mining Co.'s new mill, Amador county, Cal.; 20 stamps.
1-Eight-foot wheel, running same company's old mill; 10 stamps. John Palmer, Supt.
1-Six-foot wheel, running Talisman Mining Co.'s Mill, Amador county, Cal.; 10 stamps.
1-Eight-foot wheel, hoisting and driving pump at same company's mine. John Tregloan, Supt.
1-Four and one-half foot wheel, running Bunker Hill Mining Co.'s Mill, Amador county, Cal.; 10 stamps. John Palmer, Supt.
1-Six-foot wheel, running St. Patrick's Mill, Newcastle, Placer county, Cal.; 15 stamps. Jno. Townsend, Supt.
1-Eight foot wheel, hoisting and running pump, compressor and hoisting at Sheba Silver Mining Co.'s mine, State of Nevada.
1-Four and one-half foot wheel, running Luck Q. M. Co.'s Mill; 10 stamps; Oregon.
1-Four and one-half foot wheel, running Republic Mill, Nevada county, Cal.; 20 stamps. E. H. Dyer, Supt.
1-Six-foot water wheel running at the Plumas Eureka Mill, Cal., 48 stamps, 2 pans, 9 ore-breakers and 22 concentrators.
1-Eight-foot water wheel running 40 stamps for the same Company. Wm. Johns, Sup't.
4-Six-foot water wheels running the Sierra Buttes Mills, Sierra Co., Cal. Wm. Johns, Sup't.
2-Six-foot and 2 four and one-half-foot wheels running Soulsby G. M. Co.'s Mills, hoisting and pumping works, Sonora, Tuolumne County, Cal. J. Leechman, Sup't.
1-Six-foot water wheel running Providence 20-stamp mill, Nevada City, Cal.
1-Four and one-half-foot wheel running DeFrees Mill, Tuscarora District Nevada.
1-Six-foot water wheel running 20 stamps at Julian mine, Newcastle, Placer Co., Cal. A. H. Schnabel, Prop'r.
1-Six-foot water wheel running Mammoth Mill, 30 stamps and 14 pans and ore-breakers, Mammoth Lake District, Mono Co., Cal. Clark, Sup't.

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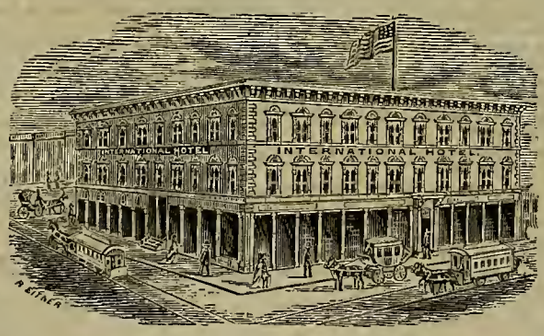

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Natural Dark West Virginia Lubricating Oils,

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High Fire Test Water White Illuminating Oils,

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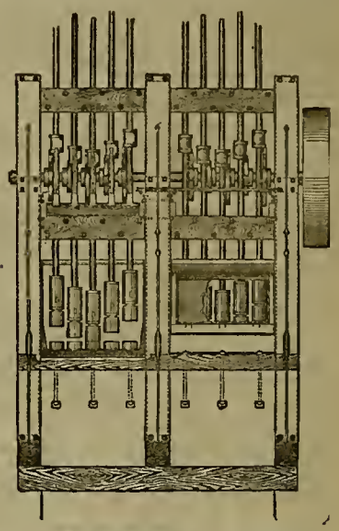
Grinding and Amalgamating MACHINERY.

Stamp Mills, Rock Breakers, Crushing Rolls, Amalgamating Pans and Separators for Gold and Silver Ores, Chlorodizing Furnaces, Retorts, Rock Drills, Air Compressors, Steel Shoes and Dies for Stamps, and every description of Mine and Mill Supplies.



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Wrought-Iron Frame

FOR STAMP MILLS.

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We are furnishing all the Machinery for a 10-Stamp Gold Mill, including Crucible, Steel Shoes and Dies, Boiler and Engine, Counter Shafting, Pulleys, etc., Stamps weighing 750 lbs. each, with Copper Plate inside of the Mortars, and for tables outside, making all the Machinery complete for a 10-Stamp Mill for the sum of

$2,250.

We construct Mills with Stamps weighing from 350 to 900 lbs. for gold or Silver Ores. Wet or dry Crushing Mortars. Will contract to erect complete Gold and Silver Mills on the most improved plans. We have 30 years' experience in mining and milling Gold and Silver Ores, and can compete with the world. Send for a circular. Address

MOREY & SPERRY,

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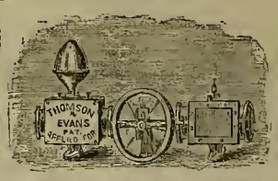
THOMSON & EVANS,

(Successors to THOMSON & PARKER.)

Engineers and Machinists.

Rubber Suction HOSE Made to Order.



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Plans and Specifications for Machinery furnished. Repairing promptly attended to.

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The Prospector's "Wee Pet" Assayer, (Patented)	100 00
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CHARGES.—ASSAYING, $3; TESTING, $2 per metal.

Assaying and Testing Taught.

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MODEL MAKERS.

INVENTORS

Will find it to their advantage to call on us at 328 BUSH STREET, bet. Montgomery and Kearny, (up-stairs,) S. F.

[CONTINUED FROM PAGE 229.]

CON. VIRGINIA.—The raise from the 1050 level is passing through porphyry carrying stringers of quartz, and is up 65 feet. The drift, 2150 level, running south to connect with the joint Best & Belcher winze from the 1900 level of that mine, is passing through favorable looking rock; total length, 360 ft.

CALIFORNIA.—The raise in the ore vein on the 2150 level is being carried up by 3 sets of timbers in width, the ore being stoped as it proceeds. It is being made to ascertain the extent of the ore of the vein upwards.

IMPERIAL CON.—The crosscut recently started east on the 2600 level and from a point 125 ft north of the south winze is penetrating quartz giving low assays; total length, 38 ft.

SILVER HILL.—Crosscut on 1300 level is passing through porphyry and low grade quartz, its face 490 ft from its initial point.

EXCHEQUER.—The crosscut running west on the 2400 level and 100 ft from the south line is in porphyry carrying some streaks of fine-looking quartz of low grade.

BROPHY.—The south drift in the ledge and from the tunnel level has encountered some ore assaying as high as $21.30, and is prospecting for more.

EUREKA DISTRICT.

LEACHING PROCESS.—*Sentinel:* Donald Fraser has been experimenting on a large pile of tailings at Mineral Hill, and says the leaching process proves successful. He brought in 20 pieces "buttons" of silver, extracted from different samples of ore, and varying from one to six ounces in weight and about 800 fine. There are about 50,000 tons of tailings at Mineral Hill that will work $11 per ton.

ARASTRAE.—The Lyon County *Times* says: "An arastra is being put up in American ravine. This will make the fifth erected in this district during the past 12 months. These small concerns are inexpensive, and invariably yield a good income. A few sites are yet unoccupied, but if they continue to be taken up at the present rate there will soon be none left."

GOOD HOPE DISTRICT.

ELKO COUNTY.—Reno *Gazette:* The district was located about three years ago, but has been neglected until recently. It lies about 70 miles north of Battle Mountain, and three miles west of the Owyhee river. The prospects for development are now pretty bright. Among the most prominent claims there are the Amazon, now bonded to Tuscarora parties for $20,000; the Page & Kelly, and the Golden Era, bonded for $10,000 each. The camp needs capital. There is no mill there, and wood is very scarce. F. W. Wetherill has just returned from a six weeks' prospecting trip and says there is a great variety of ore in the district, of which he has brought back numerous samples. There is a very singular formation in the Amazon mine. Against the footwall of porphyry a two-ft vein of a soft talcose substance has been encountered. Before exposure to the air, it is soft, sticky and tenacious like adobe soil; but after drying in the air it solidifies and has the appearance of soapstone, feeling somewhat like talcose slate. Mr. Wetherill proposes to have a specimen of it analyzed.

WILLOW CREEK DISTRICT.

MOONLIGHT MINE.—From the *Silver State* we learn that work is being vigorously pushed forward in the mine. The drift on the ledge at the bottom of the incline is in 90 ft.

OHIO MINE.—This shows a well-defined ledge, measuring 6½ ft from wall to wall and very rich at the footwall. Ore is being shipped to Salt Lake.

ROCK CREEK.—Rich mines are being worked here. An assay from one owned by Mr. Leonard showed $170 per ton in silver.

BLUE ATLANTIC, at the head of Rebel creek, is very rich, even the croppings assaying $140 in silver per ton.

FALL CREEK.—Reno *Gazette:* Some dams on Fall creek were maliciously destroyed with powder not long ago. The dams formed reservoirs for the water supply of the Blue Tent Gravel mining company. Mr. Cortney of London, the President, and Prof. Thomas Price, the Secretary, came to Emigrant Gap on the train last night to make arrangements for rebuilding the dams destroyed.

ARIZONA.

SANTA CATALINA.—The Tucson *Star* asserts that D. B. Rea is just in from the Santa Catalina mountains, and brings in some fine specimens of rich gold and silver rock from a number of locations in which he is interested. The ores and chlorides and black sulphurets run up as high as $350 per ton He reports the facilities for mining and milling of the best, plenty of wood, water and grass, and a climate unexcelled in salubrity and mildness. This is a new district and promises to vie with the other rich mining districts of the county. Mr. Rea sends out supplies to commence developing his claims. We also learn that there are other claims just recently discovered that give high results on assay, going up as high as $1,300 per ton. It lies about 40 miles from Tucson, and easy of access by the old Fort Grant road.

COLORADO.

BASSICK MINE.—Salt Lake *Tribune:* This mine is located at Rosita, about 6 miles from Silver Cliff. Since it was discovered two years ago it has yielded half a million of dollars, with $140,000 worth of ore now on the dump. The vein is said to be the richest of all the telluride gold finds. It is now down 240 ft. On every side all the way down is rich ore. A crosscut of 55 ft shows ore all the way, with no indication of walls. The average value of the ore heretofore shipped to the smelters previous to June last was $220.55 per ton. Selected ores run from $4,000 to $7,000 per ton. Telluride boulders worn by water apparently, are found in rich earth or clay all through the vein, and grow richer as depth is reached. Pieces of the country rock are found in the vein which look as if they had been boiled in a mineral solution and assay high in gold. The water-worn look of the rich boulders before mentioned, with other indications, are relied upon and seem to sustain the theory that a boiling spring holding minerals in solution was once active in and through the fissure and deposited the rich ores now found therein. The ore is there in sight in large quantities, and experienced mining experts pronounce the ore body enclosed in a fissure vein of great depth and permanency. The mine has been thoroughly timbered, hoisting and pumping works have been added, and the monthly output at from 20 to 25 tons raised per day, is estimated at $150,000.

WELCH COAL MINE.—The supply of coal from this mine is now producing 240 tons per day, but when cold weather sets in it will be in shape to produce from 300 to 500 tons per day. The mine is situated at Louisville, on the Colorado Central railroad. The vein is from 6 to 8 ft in thickness of solid coal. Workings are 175 ft from the surface, with about 700 ft of drift west, with 13 entries and 21 rooms now being worked. Four miles of track are laid to accommodate the workings which extend north, south and east from the shaft, the immense mass of coal on the east not being broken into yet.

IDAHO.

YANKEE FORK.—An old resident of Nevada just returned says of this new Dorado through the *Silver State:* The mines are rich and extensive, but they have not yet been developed to any great extent. There are no mills in the district, but there was one at Challis awaiting the completion of the road which is now being built from that place to Bonanza City. There are three arastras in the camp, two of which are used to work ores from the Norton mine. There is one gold claim being worked near Bonanza City; but nothing can be done in the silver mines until mills are built, as the ore does not pay to ship. It is now a poor camp for poor men, and perhaps always will be, as the country will be overrun with Mormons, with whom Nevadans or Californians cannot compete in the labor market. The Custer, one of the prominent mines, has been purchased by a California company with the intention of building a mill and working the mine extensively.

ITEMS.—*Herald:* There are more men at work on Custer mountain at present than at any time since the discovery of the mines. The placer mine of J. G. Morrison, above the mouth of Jordan, is being worked yet, and yields largely of the yellow dust. A large piece of rock from the Custer, brought down by pack mule last week as a specimen of second-class ore, sampled $583. The miners and claim owners in Bay Horse, Kinnikinick, Ramshorn and Poverty Flat are getting out much high grade ore, and shipments to Salt Lake are going on. J. J. Lamb and James Cassy have discovered a rich vein, 5 ft wide, on the west side of Yankee Fork, and one mile above the saw mill. The ore, as assayed by Shannon & Parks, returned $40 in gold and $4 in silver. Some new and rich strikes are reported on the east fork of Salmon. The veins are from 4 to 6 ft in width, and the ore assays $400 in silver per ton. It is in the base range.

STANLEY BASIN.—A very wide and fine ledge of gold and silver ore was found last week in Stanley basin by Mr. Elliott. The ore assayed here showed $124 silver and $52 gold per ton. The ledge is an immense one, being from 20 to 30 ft in width. The ore assayed was from the surface. It has long been believed by miners that Stanley basin possesses some rich quartz mines, as gold is found all over that section, and this discovery verifies their belief. Mr. Elliott was searching for cinnabar at the time of the discovery, and is still firm in the belief that he can find the place or ledge from which the rich cinnabar float found in the basin comes. Parties have already outfitted and gone to Stanley to prospect for quartz.

OREGON.

STERLING MINE.—Jacksonville *Sentinel:* Work to establish the new base in the Sterling mine is progressing rapidly. A deep cut is being opened just below the point where piping will be commenced. Everything will be in readiness to open on ground of known richness in a short time.

UTAH.

BONHAM GOLD MINE.—The New York *Mail* says: A company is now being organized in this city among prominent capitalists to purchase the well-known Bonham gold mine, situated in Bingham canyon. Prof. Blake, of Yale college, has been sent to examine the mine. The vein is said to be one of the largest yet discovered. It is reported as 100 ft wide, all of which will pay to mill. Enough developments have been made in the Bonham to prove the same a continuous and true ore channel. The claim is now in a condition to produce over 100 tons of ore daily, which, deducting all expenses for mining and milling will net a profit of $10 per ton.

Recent Decisions Relating to Patents, Trademarks, Etc.

Commissioner's Decisions.

Fastening colors—*Ex parte* Smith. Decided August 26th, 1879.

1. The question whether a complete process, chemical or mechanical, can be sub divided—a claim for one of the subdivisions can be joined with a claim for the complete process—turns on the question whether such sub-divisions constitute sub-processes, affecting themselves distinct results subsidiary to the general result of the entire process.

2. An applicant may join in one application a broad or generic claim for a method or process and a specific claim for one of its forms or modifications; but he cannot unite such broad claim with specific claims for two or more of its modifications, nor can he unite in one application two such specific claims without the generic claim.

3. An applicant may join in one application a broad claim for a process of fixing colors, as elements, (1) painting the substance, (2) heating it, (3) subjecting it to the action of vapor, and (4) raising the temperature of the vapor during its application; and a claim for one specific form or modification of the process covered by the broad claim, including, for example, (1) painting the substance with corrosive colors, (2) heating it, (3) subjecting it to the action of vapor, and (4) raising the temperature of the vapor during its application.

4. Two claims, of which one does and the other does not show a gradual increase in the temperature of the vapor as an element of the process of fixing colors, cannot sustain to each other the relation of process and sub-process, nor that of genus and species, and cannot coexist in one application.

Glass Furnaces—Nicholson vs Bennett *et al.* Decided August 26th, 1879.

1. Interferences between patents cannot be adjudicated in the Patent Office; but interferences between one or more applications and two or more patents can be adjudicated in the Patent Office, and priority awarded to one of the patents or to an application according to the facts, and such adjudication is binding upon all parties so far as the interference in the Office is concerned, although not conclusive as to the relative rights of the parties outside of the office, nor even in *ex parte* proceedings in the Office.

2. It is the fact, and not the possibility of the claim of an invention by an applicant, which legalizes the declaration of an interference between his application and other applications or patents showing but not claiming the device.

3. Subjects of interference are things, not words; and the same words must mean the same things in their application to several devices in interference.

4. The word "deflecting" is accurately applied to the two inclined planes which constitute the upper walls of the combustion chamber in Arbogast's patent, No. 180,517, dated August 1st, 1876; but it has not the same meaning when so applied which it has when applied to the upper walls of the combustion chamber in Nicholson's application, filed May 28th, 1877, and in Arbogast's patent, No. 188,328, dated March 13th, 1877. On this point, the application and the patent of 1877 are not anticipated by the patent of 1876.

ANOTHER disaster to the Government troops is reported from Colorado—Major Thornburgh's command having been ambuscaded on Milk river by Ute Indians and suffering heavy loss, the commander of the expedition being among the slain. Active preparations are being made to capture the Indians.

Points Under the Mining Laws, Etc.

There are certain points of orders and decisions by the Interior Department in regard to mineral lands which it would be unnecessary to allude to, because of their being clearly laid down in the law, were it not for the fact that the cases which frequently come before the Interior Department demonstrate that the plainest intendment of the law is the most frequently violated or overlooked. All sorts of points have been decided lately, from those which are fatal to the applicant's claim, down to those which involve the routine of the office.

One of the most important points to be regarded is that in the General Land Office all claims are acted upon in the order of presentation, and there is not the slightest use for any person, no matter how influential he may be, to ask for special privileges. This rule is under a new order of things, and is promulgated by the Commissioner in reply to the daily demand made to have cases taken up out of their proper order.

During the past five months over 500 patents for mineral lands have been issued—a larger number than ever before during the same period of time. This presumes a larger number of applicants, and in the necessary routine of the office, if a claim does not conform in every particular to the rules of the office and of course to the laws, even in the use of ordinary paper fasteners in connecting documents, instead of paste or mucilage, it is not ready to be acted upon, and losing its place goes back to begin over again, perhaps being returned for correction, thus losing considerable time.

Claims are suspended daily in the General Land Office solely because applicants or their agents neglect to conform to the plainest rules of the office. As for instance, they fail to file regulations, to have abstracts of letters certified by the proper officers filed; affidavits as to posting on claim omitted, etc.

Many applications have been "suspended" for want of proof of facts. Lack of proof of citizenship is one of the most common omissions.

Hereafter Registers and Receivers are required to obtain satisfactory non-mineral proof only to date of final proof in all classes of entries, except minerals, upon lands withdrawn or designated as mineral lands. Heretofore the practice has been variable, some officers requiring this non-mineral proof in advance of allowing an entry (other than under the mining laws) of lands withdrawn or designated as mineral.

Discrepancy in description is another and very common reason assigned for suspending a claim after it reaches the General Land Office. In a case lately considered, an adverse claim was rejected because it had been sworn to in San Francisco, when it should have been sworn to in the district where located, the defect being considered fatal.

Another error, also common, is the neglect of the Recorder to attach his certificate and seal to a copy of location notice and affidavit of publication. The sworn facts in any case cannot be made by an attorney, except in the case of a corporation, or one co-owner for another. In all other cases the proof must be made by the claimant. No person who is not in actual possession of land can apply for a patent, and one in possession cannot maintain it except by a hearing to determine the facts, as provided in Sec. 2325 Revised Statutes. An occasion for making this statement arose in the case of the American Flag G. M. Co. vs. The Bennett Lode, Nevada mining district, Gillespie county, Colorado.

Occasionally cases arise in which parties claim repayment from the Land Office, and in a recent case passed upon by the Acting Commissioner of the General Land Office, where money paid in to the local office was misapplied, it was held that the claimant has no claim upon the Government, and that the only remedy was to institute a civil suit for recovery against the Receiver: "Registers of the U. S. Land Offices are not the authorized agents of the Government for the purpose of receiving money from claimants and receipting therefor, and the Government cannot be held responsible for their actions in this regard, nor has the Office any authority to allow a claimant credit for money paid to and misappropriated by Registers." A bad state of affairs for the compelled claimant.

Repayments are not made when obstacles to the confirmation of title did not exist through the fault of the Government at the date of sale in cash, or any other disposal of public lands. Appeals from rejection of claims decided by the Commissioner must be made within 30 days.

It is evident that nothing but a little care in complying with all the requirements of the law and rules of the Land Office will enable any claim to avoid a postponement, involving trouble, expense and time. The law evidently takes no note of time, regarding delays, expense, etc., in the light of a well-merited punishment for the non-observance of its tenets.

THE Indian Salvador, who murdered Paul Rieger in Marin county, was hanged on the 2d inst. at San Rafael.

JOHN E. GREEN has been awarded $15,833 for the loss of a leg in the Old Colony railroad disaster in Massachusetts.

PROF. WISE, the aeronaut, ascended in a balloon from St. Louis Sept. 28th, and has not since been heard of.

News in Brief.

A DAMAGING brush fire near Santa Cruz.

GRANT will be in Chicago November 13th.

A FISH-CULTURE ASSOCIATION has been formed in Chicago.

AT Pittsburg 150 tanners struck for an increase of wages.

COOPER the American forger has been captured in London.

YELLOW FEVER has taken a fresh start at Concordia, Miss.

THE situation in Eastern Roumelia is considered very critical.

GORTSCHAKOFF will visit Berlin for a conference with Bismarck.

THE disturbance in Eastern Roumelia is becoming a guerrilla war.

THE Hyde Park Bank, at Scranton, Pa., has made an assignment.

MOBILE has removed her quarantine restrictions against New Orleans.

A REUNION of survivors of Southern prisons took place at Toledo, O.

THE weather last week was as warm in New York as in midsummer.

A STEAMER from Europe brought to New York, Oct. 1st, $440,000 in gold.

PRESIDENT HAYES and party were warmly received at Springfield, Ill.

THE report of the Russian victory over the Tekke Turcomans is confirmed.

ST. GOTHARD PASS, in Switzerland, is blocked with snow, suspending traffic.

DURING September the coinage of the U. S. Mints amounted to $9,279,906.

THE Philadelphia Mint, during August, coined 1,808,050 silver dollars.

AN advance in freight rates from Chicago to New York will take effect Oct. 13th.

GEN. GRANT and party, en route to Yosemite, were warmly welcomed at Stockton.

THE Spanish government has sent 4,000 men to Cuba, and will soon send 4,500 more.

THE returns of the recent German elections indicate the success of the Conservatives.

IT is denied from Pittsburg that a general strike of Trades Unions is contemplated.

BARON CHALICE will succeed Count Zichy as Austrian Ambassador at Constantinople.

TWENTY-FIVE important political trials will be held in St. Petersburg during October.

UP to Oct. 1st arrears of pension claims had been settled to the amount of $20,734,507.

AN earthquake was felt at Oakland and other places around the bay on the morning of the 2d.

THE United States Assay Office at New York, Oct. 1st, paid out $639,127 in specie.

THE capital stock of the Bank of California is to be reduced from $5,000,000 to $3,000,000.

HON. FRANCIS GILLETTE, ex-United States Senator, died at Hartford, Conn., Sept. 30th.

THE United States steamer *Tuscarora* has been ordered to leave San Francisco for Mazatlan.

THE Treasury purchased 239,000 ounces of silver bullion for the Philadelphia Mint, Oct. 1st.

ACCORDING to dispatches, the insurgents in Cuba are being worsted by the Government troops.

IN a fight between soldiers and desperadoes in Indian Territory, nine of the latter were killed.

BONDS amounting to $28,000, stolen from the National bank of Baltimore in 1878, have been recovered.

SMITH, who stole bullion from the S. F. Mint, has been sentenced to four years in the State Prison.

THE industrial parade at Indianapolis was a great success, every branch of trade being represented.

A DETERMINED attempt is being made in Washington Territory to recapture the escaped Perkins murderers—one of them having already been killed by officers.

WATER GAUGE FOR VESSELS.—Jacob Eckhoff, of San Rafael, Marin county, has patented through the MINING AND SCIENTIFIC PRESS Patent Agency an improved water gauge for vessels, by means of which the quantity of water in a ship's hold is indicated at all times. It consists in placing a float valve inside a tube or pipe connecting with the lowest part of the hold; said float being so connected by a cord and gearing as to actuate a pointer on an indicator card or check, as to indicate in feet and inches on the card, the amount of water in the vessel at any time. A check pointer is also connected with the card so that it may be set and the difference in the water level between any one time and another be ascertained, so as to know of any increase or diminution of leakage exactly in inches. The box with the gearing and indicating card may be placed in the cabin of the vessel or elsewhere, and need not necessarily be immediately over the pipe or tube carrying the float, since the cord may be led from the float over suitable pulleys or in supplemental tubes. In this way a very convenient means of measuring the water in a ship's hold is obtained. Ordinarily it is necessary to sound the well by means of a string and weight on a rod; but this is a very unsatisfactory method, and takes some time. With the indicator card always in view the state of the water in the vessel is always known and any increase shown. A bell may be connected with the pointer or gearing so that when over a certain amount of water is in the vessel it will sound the alarm and call the attention of the proper officer to the fact.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING SEPT. 30TH, 1879.

220,076.—WRENCH—Andrew Jackson, S. F.
220,180.—DREDGING MACHINE—S. W. Shaw, S. F.
220,102.—HAND WEIGING TOOL—H. White, Quincy, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

SOLES FOR RUBBER BOOTS.—Charles H. Beach Althouse, Josephine Co., Oregon. No. 219,672. Dated Sept. 16th, 1879. The object of this invention is to provide a leather sole for rubber boots. The method usually adopted is to fasten the leather sole either with screws or tacks directly to the bottom of the boot, which is not always reliable. In this invention the soles are attached in the following manner: The leather main sole is large enough to lap or turn up around the edge of the rubber sole of the boot. To this main sole is fastened a tap-sole either with rivets or screws, the tap-sole only covering the bottom of the boot, the same as in ordinary tap. The main sole is then fastened to the edge of the rubber sole with small screws or tacks, which are put in horizontally to the rubber sole, thus attaching both soles to the boot. By this method there is no strain or wear on the leather of the main sole or the screws with which said main sole is fastened, so that the bottom of the rubber boot can never leak.

THILL COUPLINGS.—William Quinlan, Mayfield, Santa Clara county, Cal. No. 219,175. Dated Sept. 2d, 1879. The object of the inventor is to produce a means by which the shafts of a vehicle may be readily connected and disconnected without the use of a wrench or other tool, and at the same time have the parts so made that when in position they will not become accidentally displaced. The rear end of the shaft has a bolt passing through it, the outer ends of which are set in hook arms on the clips that secure the axle of a carriage to the bolster. A bail is placed under the shaft-iron and secured by means of the bolt in the shaft; this bail is connected to the clip by a short strap, thus holding the shaft in its place and preventing displacement. The invention is simple and very convenient, and will no doubt meet with ready sale wherever introduced.

WAGON BRAKES.—Harris G. Cox, Alvarado, Alameda Co., Cal. No. 219,692. Dated Sept. 16th, 1879. This invention consists in so constructing the brake that it may be operated by the back-pulling action of the horses, or may be operated by an ordinary hand lever, as desired, and may be applied to any ordinary vehicle or street cars. It differs from ordinary horse brakes in that the wagon may be backed at any time without locking the wheels, while at the same time the wheels may be locked if it is desired to do so.

SODA WATER BOTTLES.—B. Hegele, San Jose, Cal. No. 219,723. Dated Sept. 16th, 1879. This device relates to improvements in soda water bottles and stoppers; and the improvements consist in certain details of construction whereby the stopper is made to act in a double capacity, closing the bottle both when it is filled and when it is empty, so that in the latter case all dust and dirt are excluded, and the bottle can only be used for effervescent liquor, which is filled with it when said bottle is in a reversed position.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

HOW TO STOP THIS PAPER.—It is not a herculean task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

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EXPERIMENTAL MACHINERY, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. See ad. F. W. FULLER, 415 Market St., second floor, S. F.

Chew JACKSON'S BEST Sweet Navy Tobacco

METALS.

[WHOLESALE.]
WEDNESDAY M., October 8, 1879.

IRON.—	
American Pig, soft, ton	28 00 @35 00
Scotch Pig, ton	26 00 @30 00
American White Pig, ton	25 00 @— —
Oregon Pig, ton	28 00 @35 00
Refined Bar	4 @ 3
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 8
Norway, according to thickness	7 @ 8
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	18 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @ —
TIN PLATES.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb. less than cask	9½@— 10
NAILS.—	
Assorted sizes	3 50@4 00

LEATHER.

[WHOLESALE.]
WEDNESDAY, M., October 8, 1879.

Sole Leather, heavy, lb	22 @ 29
Light	20 @ 24
Jodot, 8 Kil., doz	48 00 @50 34
11 to 13 Kil	45 00 @57 00
14 to 19 Kil	61 00 @78 00
Second Choice, 11 to 19 Kil	55 00 @70 00
Cornelian, 12 to 16 Kil	57 00 @67 00
Females, 12 to 13 Kil	63 00 @67 00
14 to 16 Kil	71 00 @76 00
Simon Ultimo, Females, 12 to 13 Kil	58 00 @62 50
14 to 16 Kil	66 00 @70 00
16 to 17 Kil	72 00 @74 00
Simon, 18 Kil	61 00 @63 00
20 Kil	65 00 @67 00
24 Kil	72 00 @74 00
Robert Calf, 7 and 9 Kil	35 00 @40 00
Kips, French, lb	1 00 @ 1 35
Cal. doz	40 00 @60 00
French Sheep, all colors	8 00 @15 00
Eastern Calf for Backs, lb	1 00 @ 1 25
Sheep Roans for Topping, all colors, doz	9 00 @13 00
For Linings	5 50 @10 50
al. Russet Sheep Linings	1 75 @ 4 50
oot L egs, French Calf, pair	4 00 @— —
BGood French Calf	4 00 @ 4 75
Best Jodot Calf	5 00 @ 5 25
Leather, Harness, lb	35 @ 37½
Fair Bridle, doz	48 10 @72 00
Skirting, lb	33 @ 37
Welt, doz	30 00 @50 00
Buff, ft	15 @ 17
Wax Side	15 @ 17

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending October 7, 1879.

HIGHEST AND LOWEST BAROMETER.

Oct. 1	Oct. 2	Oct. 3	Oct. 4	Oct. 5	Oct. 6	Oct. 7
30.107	30.047	30.032	29.804	20.859	29.872	29.937
29.992	29.992	20.900	20.838	29.832	29.753	29.850

MAXIMUM AND MINIMUM THERMOMETER.

72	76	65	65	63	65	60
57	57	55	56	56	52	52

MEAN DAILY HUMIDITY.

68.3	60	79.3	80.7	73.7	84	71.7

PREVAILING WIND.

W	W	SW	W	SW	SW	W

WIND—MILES TRAVELED.

207	126	224	185	342	353	202

STATE OF WEATHER.

Fair.	Clear.	Clear.	Clear.	Fair.	Fair.	Clear.

RAINFALL IN TWENTY-FOUR HOURS.

				.43	.13	

Total rain during the season, from July 1, 1879, 0.59 in.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Alpha Hydraulic Gravel Mining Company.

Principal place of business, San Francisco, California. Location of works, Alpha Hill, Nevada Co., California.

Notice is hereby given that at a meeting of the Board of Directors held on the 2nd day of October, 1879, an assessment (No 1) of Twenty Cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold and silver coin, to the Secretary, at the office of said Company.

Any stock upon which this assessment shall remain unpaid on the Tenth day of November, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the Thirteenth day of December, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. JAMES IRELAND, Sec'y.

Office, No. 216 Sansome street, San Francisco, California

Butte Hydraulic Mining Company.—

Location of Principal Place of Business, San Francisco, California. Location of Works, Butte County, Cal.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 1) levied on the 20th day of August, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
E. Poirson	13	2½	$25 00
A. G. Hawes	17	10	100 00
I. M. Scott	18	10	100 00
Wm. Labadie	10	5	50 00
J. G Stout	21	2½	25 00
Louis Laplerro	22	2½	25 00
H. Marcoux	24	2½	25 00
John Britt	20	2½	25 00
J. H. Mooney	27	2½	25 00
Zotigue Gervais	29	8	80 00
Zotigue Gervais	30	1	10 00
Zotigue Gervais	31	1	10 00
Geo. W. Deitzler	37	5	50 00
E. Chaquette	38	5	50 00
Americat M and Dredging Co	40	5	50 00
N. Desautelle	41	2½	25 00
J. Lacier	42	2½	25 00
N. Goldtree	43	7½	75 00

And in accordance with law and an order of the Board of Directors made on the 26th day of August, 1879, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, room 20, No. 328 Montgomery street, San Francisco, California, on Tuesday, the 21st day of October, 1879, at the hour of 10 o'clock A. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

L. L. DENNERY, Secretary.

Office, room 20, No. 328 Montgomery street, San Francisco, California.

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OUR U. S. AND FOREIGN PATENT AGENCY presents many and important advantages as a Home Agency over all others, by reason of long established, great experience, thorough system, intimate acquaintance with the subjects of inventions in our own community, and our most extensive law and reference library containing official American and foreign reports, files of scientific and mechanical publications, etc. All worthy inventions patented through our Agency will have the benefit of an illustration or a description in the MINING AND SCIENTIFIC PRESS. We transact every branch of Patent business, and obtain Patents in all countries which grant protection to inventors. The large majority of U. S. and Foreign Patents issued to inventors on the Pacific Coast have been obtained through our Agency. We can give the best and most *reliable* advice as to the patentability of new inventions. Our prices are as low as any first-class agencies in the Eastern States, while our advantages for Pacific Coast inventors are far superior. Advice and Circulars free. DEWEY & CO., PATENT AGENTS.

A. T. DEWEY. W. B. EWER. GEO. H. STRONG.

In consequence of spurious imitations of

LEA AND PERRINS' SAUCE,

which are calculated to deceive the Public, Lea and Perrins have adopted A NEW LABEL, bearing their Signature thus,

Lea & Perrins

which is placed on every bottle of WORCESTERSHIRE SAUCE, and without which none is genuine.

Ask for LEA & PERRINS' Sauce, and see Name on Wrapper, Label, Bottle and Stopper. Wholesale and for Export by the Proprietors, Worcester; Crosse and Blackwell, London, &c., &c.; and by Grocers and Oilmen throughout the World.

To be obtained of CROSS & CO., San Francisco.

Annual Meeting.—Syndicate Mining Co.,

of Bodie, Mono County, California.

The annual meeting of the above named Company will be held at the office, Room 26, Hayward's Building, 419 California street, San Francisco, Cal., on Thursday, October 16th, 1879, at 1 o'clock P. M., for the purpose of electing a Board of Directors to serve for the ensuing year, and for the transaction of such other business as may properly come before the meeting. Also in accordance with a resolution adopted at a meeting of the Board of Directors, held September 15th, 1879, to take into consideration and decide upon the proposition to increase the capital stock of said Company, from Five Million Dollars divided into fifty thousand shares at the par value of one hundred dollars per share, the present capital of the Company, to Ten Million Dollars, to be divided into one hundred thousand shares of the par value of one hundred dollars each.

THOS. G. TAYLOR,
ROBT. N. GRAVES,
GEO. W. HOPKINS,
CHAS. H. FISH, } Directors.

The transfer books will be closed October 6th, 1879, at 3 P. M. JACOB STADTFELD, JR., Secretary.

The Pacific Land and Trust Company.—

Location of principal place of business and works, San Francisco and State of California.

Notice is hereby given that at a meeting of the Board of Directors held on the eighteenth day of September, 1879, an assessment (No. 1) of One Dollar and Twenty-five cents per share was levied upon the capital stock of said corporation, payable immediately to the Secretary at the office of the company, 513 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on Saturday, October twenty-eighth (28th), 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before will be sold on Saturday, November eighteenth (18th), 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale. WM. ANDREWS, JR., Secretary.

Office, 513 California street, San Francisco, Cal.

Dividend Notice.—Office of the Pioneer

Mining Company, room 15, No. 310 Pine street, San Francisco, California, September 29th, 1879.

At a meeting of the Board of Directors held this day, a dividend (No. 1) of eight (8) cents per share was declared on the capital stock of the company, payable Monday, October 6th, 1879. Transfer books closed.

J. W. PEW, Secretary,

MECHANICS' MILLS.

OUR WELL KNOWN

WATER TANKS,

Made by machinery, constantly on hand and made to order. PAN STAVES and OAK GUIDES a specialty.

WELLS, RUSSELL & CO.,
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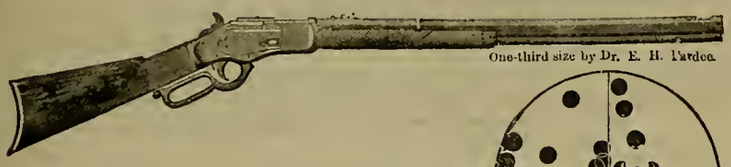

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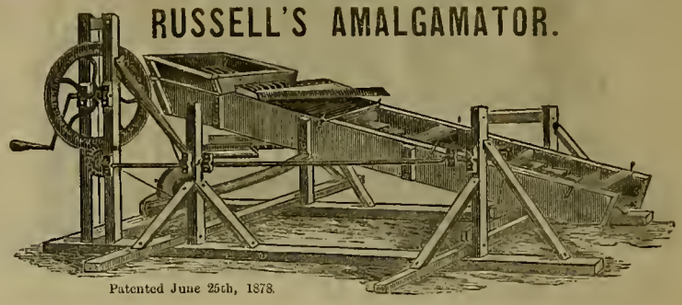

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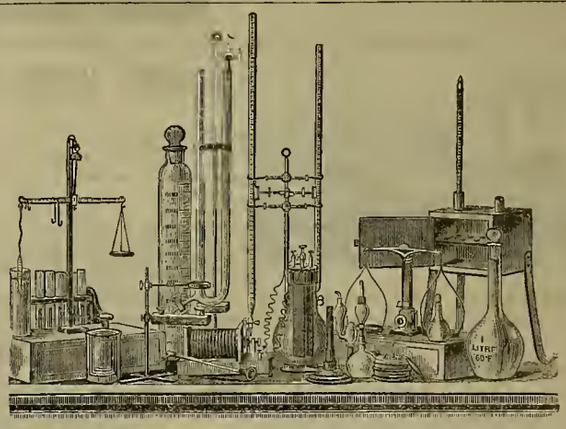

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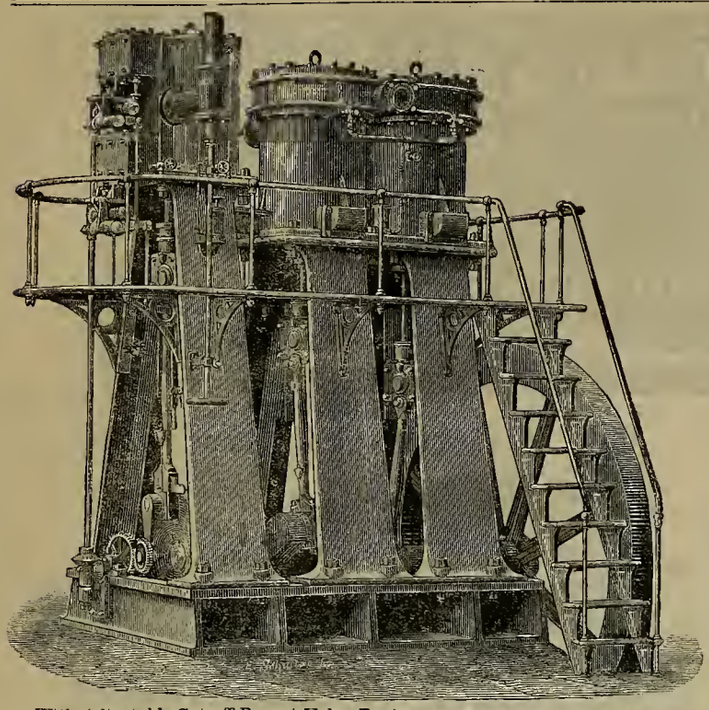

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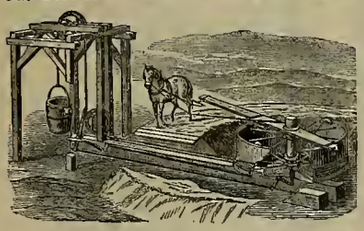

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The Field of Chemistry.

Although vast strides have been made in the number of chemical combinations, some of them so remarkable as to border upon the creative act, the field is still limitless. Every new combination, or readjustment of atoms, so to speak, furnishes a foundation for others of still greater perfection. The number of compounds of acids, gases and alcohols reaches into the thousands of millions, so that the student need never fear that there will be nothing left worth investigating. Not every experiment in chemistry is attended with success. Nor does every successful experiment lead to any practical value. It is impossible, however, for any experiment to be fruitless, even if confined to the laboratory, for it adds to the knowledge of properties and to at least a technical value. It is now well known that the majority of fruit essences and flavors are simple chemical combinations, without any element of the natural fruit in them. When petroleum was first discovered in America, or rather when it first came into use, it excited very little attention, except as a liniment for physical ailments, until by a little chemical manipulation it was adopted as an illuminator. The failure of the turpentine product during the war brought into use the lighter product of petroleum, or benzine, in its stead. Further experiments developed lubricating oil, then paraffine, tar, and most wonderful of all, the brilliant aniline colors. In regard to paraffine from petroleum, it may be said that experiments have been in progress to extract the hydrogen atom in its composition and obtain carbon or graphite.

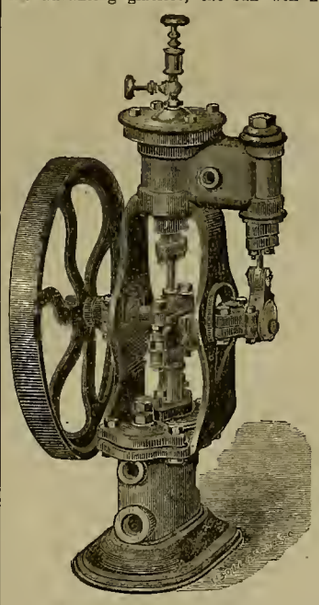
The components of many substances are so well known that they may be compounded as easily as they can be converted into their constituents. Cane sugar may be easily converted into grape sugar (glucose) by the abstraction of the element of water, and why should not grape sugar or glucose be converted into cane sugar? It has probably never yet been accomplished, although synthetical chemistry has many devotees. Kolbe, aware that salicylic acid could be readily converted into carbolic acid, by liberating carbonic acid, reasoned that if he could make carbonic acid act upon and combine with carbolic acid, salicylic acid would be the result. He found a cheap means of accomplishing the synthesis in caustic soda, raising the temperature to give it sufficient energy. Carbon is an element too little understood. It enters into combination with many useful and valuable substances, yet it refuses to be segregated. A diamond can be converted into charcoal, but charcoal has never been converted into a diamond. The paraffine of petroleum consists largely of carbon and an atom of hydrogen, yet nobody has succeeded in liberating that atom of hydrogen. Oxygen, hydrogen, etc., are supposed to be elementary bodies, yet a French chemist demonstrated hydrogen to be a compound, and one of its components so light and of such force as to carry up into the air metallic balls filled with it.

Phenylacetic acid is made from coal tar. This acid furnishes isatins, and isatine may be converted into indigo blue. Bayer reasoned this out from the fact that when indigo is oxidized with nitric acid isatine is formed, and by means of phosphorus and chloride of phosphorus he succeeded in obtaining indigo. Now this conversion of coal tar, etc., into true imitations of nature's own products is a wide and open field, and we may say that we are scarcely beyond the first step towards crossing it.

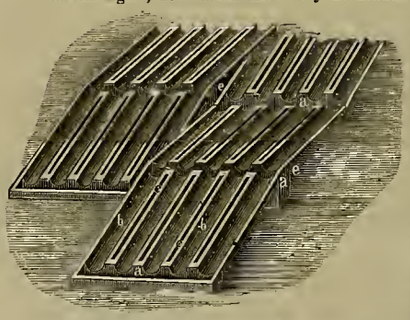
But it is not the only field unexplored. The changing or converting of one natural product into another is an equally mysterious region scarcely penetrated. The juice of the common carrot may be converted into pectin, the base of all fruit jellies, and flavored with any vegetable jelly prepared by the combination of acids and alcohols, and put upon the market as true fruit jelly of every kind, although perfectly innocent of being evolved from any fruit. Yet it is just the same. Chemical analysis could not demonstrate it to be anything else, so well known already are the elements of natural things. Starch is converted into sugar, and the sugar into alcohol by nature herself. Sawdust is converted into oxalic acid, and old rags into sweet syrups. Oil of turpentine is isomeric with oil of bergamot, lemon and lavender, but they have never been transposed. There is no reason, however, to suppose that they cannot be. We may say in fact that those things which now seem to be impossible of solution will, by the aid of continual experiment, not only be solved, but will give place to other chemical problems of equal value, which are not now even dreamed of.

THE END OF THE WORLD.—A lecture was lately delivered at the Berlin University, bearing the above ominous title. The learned professor argued that every movement upon our planet, with the exception of ebb and flood tide, which are caused by the attraction of the moon, is occasioned by solar heat. As, however, the sun loses a portion of his caloric every year, science has lately come to the conclusion that as an emitter of warmth, the sun will only last 17,000 years longer. During that space of time our earth will get colder and colder, in proportion as the solar heat shall diminish. The ice will advance from the poles to the equator; the earth's population will gradually recede before the advancing glaciers; the sun will become less and less luminous, until he will present the appearance of a dark red ball; and finally ice will annihilate all vitality on our planet. It is very easy to establish an admitted hypothesis. If solar heat is the source of motion, of course its withdrawal will produce lamentable consequences. Anybody can understand that. But science has not established any such fact. Another scientific writer whose name has escaped our memory, demonstrated with mathematical precision, that the earth's orbit is gradually contracting and the earth approaching nearer the sun in consequence, until finally our planet will become good for solar heat, so far as it goes. Perhaps both theories are partially true. If the sun is losing annually a portion of its heat, so also is the earth annually approaching the sun and in about the same ratio, so that terrestrial conditions must remain unchanged. Climate may have something to do with these theories. A native of the tropics would probably be convinced that we are approaching nearer the sun, while the Laplander might argue that it was losing its heat. The natives of the temperate zones would be divided in opinion, depending upon an unusually cold winter or hot summer, or *vice versa*.

THE coal burners in Belleville (Ills.) district are preparing for a general strike, to commence on the 15th of this month, unless they are paid three cents per bushel for mining.



New Fly-Wheel Pump.



Howland's Undercurrent and Sluice Riffle.

Sierra Mojadas Mines.

These mines of Mexico, about the immense riches of which so many glowing accounts have been lately written, are reported as being situated near the Dewey mountains, at a point where Chihuahua, Coahuila and Durango meet, about 200 miles beyond the Rio Grande. Three States have each a military force in the neighborhood, and suppress all attempts to carry on mining operations. Until within recently, it was supposed that the Mojadas were a part of the public domain, but interested parties made the discovery that the identical tract upon which the richest discoveries have been made was long ago granted away in the usual Mexican style of liberality, to the extent of six Spanish leagues square. It is stated by the writer to the *Tribune* that not only are the mines private property, but the property of an American. Indeed, the records found in San Luis Potosi, dated November 8th, 1864, declare that Don Manuel Sandoval, of Villanegras, had bargained and sold to Don Jose Adison Da Cue, of Memphis, all his right, title and interest in a certain grant of land from the supreme government. This grant referred to the land upon which the Mojadas mines are located. With the enthusiastic imagination of a correspondent who admits having seen the mines of California, Australia and Ural mountains, the *Tribune* correspondent says: "Nowhere on this planet have I ever seen the same richness in mines—the same uncounted tons of gold. The very mountains, lofty and rugged as they are, seemed to be built of gold. Untold millions of the yellow ores and dust are in sight; how much there may be hidden in the heart of the mountains only He who created all wealth can tell.

"If I had not been there, and one had attempted to tell only one-half of the truth in regard to these golden mountains, though he had been my dearest kinsman or most trusted friend, I would not have accepted his story as truth. I shall not ask you to believe me when I say that there are, in those wild, almost inaccessible mountains, great hills of gold, miles in length, hundreds of feet in hight, and hundreds of yards in width. And yet it is the literal truth. And not far away from the golden hills there is a mountain of silver ore richer than any ores of Leadville, Virginia, or any bonanza mines yet discovered. This silver mountain throws into the shade the far-famed hill of Santa Eulalia, in Chihuahua, from which $200,000,000 in silver has been taken. I know you will think I tell incredible stories. I have not told half the truth."

NEW FLY WHEEL PUMP.—We illustrate herewith one of the new pattern fly wheel pumps, made by the Valley Machine Company, of Easthampton, Mass., for which Parke & Lacy, of this city are agents. It is a light bucket plunger pump. Two sizes of this pump are made for a cheap boiler feed or light power, the smallest selling for $55. The engraving shows its general construction without the necessity of a detailed description.

Inside vs. Outside Amalgamation.

In the ordinary amalgamation of gold on plates, much discussion has arisen as to the advisability of having plates inside the mortars. Where this plan has been adopted there has been saved, at a rough average, about two-thirds the gold on them, the rest of that saved being caught on the apron and other outside plates. As the surface presented for amalgamation outside is usually many times the area of that inside the batteries, those who have practiced inside amalgamation generally believe it to be by far the best. But there are two reasons why inside plates catch so large a proportion, the first of which is simply that they have the first chance at the pulp, which does not reach the other plates until deprived of a large portion of its gold. The other and more important one lies in the motion of the pulp in the battery, which projects it against the plates with some degree of force. Every amalgamator has noticed at some time a color of gold or a small detached fragment of amalgam sliding down a run of plates without being caught until it reached a drop, or by some other means was brought into more forcible contact with the plate than its own weight would insure. This is one of the main points in gold amalgamation too commonly overlooked by our mill men. There are several objections to inside amalgamation. It is customary to have two plates in each battery—one under the feed, the other under the discharge. Both are liable to be marred by hard pieces of ore flying against them, thus rendering them rough and difficult to clean. They cannot be examined at the desire of the operator, and his manipulations must therefore be subject to signs and guesswork, instead of direct observation. The introduction of a plate below the screen necessitates raising the discharge so high as to very seriously diminish the capacity of the mill. Of course this loss depends on the width of the plate; but in some cases it has amounted to as much as one-half the crushing power. Finally, the only advantage gained by inside amalgamation, which, as above stated, is projectile force against the plates, can be readily and much more satisfactorily secured outside, if the situation admits of a little fall.

Taking everything into consideration, it would seem more advisable to confine amalgamation exclusively to outside plates, taking care always to see that they are so arranged as to give several good clear drops in the course of the run. The most satisfactory drop or fall is obtained by running the pulp through a horizontal screen of somewhat larger mesh than that used on the mortar. This separates the stream into a number of smaller ones, and insures contact of every particle in the pulp with the plate beneath, and avoids the loss of drop incurred by a portion of the pulp running back under the projecting lip of the upper plate, and thence merely running down to the next plate, as often occurs in using the ordinary drop.

Howland's Undercurrent Sluice-Riffle.

Among the variety of mechanical appliances utilized in the manipulation of the precious minerals, the mill and sluice-riffle are important. The one in our engraving is deserving of much commendation. It meets a want which has long been felt by gravel miners and millmen, viz: that of a simple, cheap riffle, which will save the largest possible amount of gold or sulphurets, with the least possible waste of quicksilver. The arrangement of this riffle is such that there is a strong, unobstructed undercurrent to carry off and break up the gravel or cement, and a slow undercurrent, checked by numerous riffles, which give gold or sulphurets a better opportunity of settling than if they were exposed to the force of the main current.

In this riffle there are cast troughs for the quicksilver, which extend entirely across the sluice, and while they are so placed that the current will naturally pitch towards them, and give every opportunity for amalgamation, the quicksilver is fully protected from flouring or leakage. There is no mechanical skill required in taking out or replacing the sections.

Messrs. Steiger & Kerr of the Occidental foundry, 137 First street, S. F., have the sole right of manufacturing this riffle.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

Arizona Mining Districts.

EDITORS PRESS:—The distance from the present terminus of the S. P. R. R., at Casa Grande, to Tucson is 75 miles by the stage road, and the time consumed is from 16 to 20 hours. The road is an excellent natural one, but made rough and dusty by the great number of heavy teams passing over it constantly. The first water after leaving Casa Grande is found at Picacho station, 20 miles distant. Water is obtained here from a well 300 feet deep, and is of good quality and abundant. The next is at Desert station, 20 miles from Picacho. Here the well is 200 feet deep, with plenty of good water. From Desert station to Tucson is 27 miles, and water can be obtained at two points on the road. From Tucson to Tombstone district is about 80 miles in a southeast direction, and to Patagonia district about the same distance southwest. The two districts are about 50 miles apart, and show an amazing contrast both in the appearance of the country and the character of the ores. The Tombstone district, now well known as the location of the Tough Nut, Lucky Cuss, Contention and other prominent mines, is being rapidly developed, and as soon as sufficient milling facilities are obtained will assume a prominent place among the bullion-producing districts. The large amount of capital invested within the last three months has given a great impetus to mining and prospecting, and the population is now estimated at 1,500, where four months ago scarcely 100 people were to be found. The veins, as a general rule, are small—one to three feet wide on the surface, and increasing in width as depth is attained. Several large ore bodies have been developed, and the indications are that many of the narrow veins lead into large ore deposits at a depth of 200 or 300 feet. The ores are free milling and generally high grade, $100 per ton being a moderate estimate for the average. The ore from the Tough Nut and the Lucky Cuss, now being worked at the Tombstone mill, is said to average $200 per ton, and the yield is $25,000 per week from a 10-stamp mill. The Contention mine has about $3,000,000 of ore in sight, and is now building a 20-stamp mill. The owners are said to have refused $2,500,000 for the mine. A number of the most promising mines have been purchased by Eastern capitalists, and as soon as the railroad is completed to Tucson supplies and machinery will be sent in and the work of development be pushed on rapidly. The great want of the district at present is a custom mill where miners could take their ores to be worked. In sinking shafts on the veins much high-grade ore is extracted, but there being no means of reducing it, it is left on the dumps, where it is soon scattered and carried off. Of 30 tons of high-grade ore taken from the Uncle Sam shaft some months ago, scarcely five tons remain, though no one can see any possible object in carrying it off. This ore was estimated to be worth $350 per ton; and had the owners any means of working it, they would have realized sufficient to pay for all the labor and expense incurred, and have had a handsome balance left to pay for further developments.

The road from Tucson approaches Patagonia district from the north over a succession of rolling hills and level plains covered with bunch grass and affording excellent grazing for large herds of cattle. As we near the Patagonia mountains the hills become shorter and steeper and are covered with oak timber, scrubby and sparse at first but becoming heavier as we progress until the country assumes the appearance of a vast park, the whole surface being covered with a luxuriant growth of bunch grass. There are no running streams of water, but springs are found in many places and water may be obtained in the gulches almost anywhere by sinking a few feet, the water being of excellent quality. "Harshaw's Camp" is, as it were, the gate of this mining region, being situated just where the mines begin. It has now two stores, two saloons, a large boarding-house, a livery stable and about thirty houses and tents. Here are the ruins of the old French furnaces, where the ores from the French mines Nos. 1 and 2 were worked years ago, before the country was abandoned to the Apaches, and here the Hermosa company is erecting their furnace. They have some 1,200 tons of ore on the dump, and expect to get their furnace running in about four months. The ores are carbonate and galena, carrying from 20% to 40% lead and from 30 to 120 ounces silver to the ton. They smelt readily without flux and are worked with little expense.

The ore bodies in this district are immense. They seem to have no well defined limits, nor do they run in regular parallel veins, but cross and intersect each other at various angles and in every direction.

The Belmont mine, owned by Page & Bacon, of San Francisco, is located nearly east and west, while the Holland mine and the Wasp run north and south, and the Wasp runs right through the center of the Belmont.

The old Mowry mine is situated about four milee south of Harshaw's camp; the walls and chimney of the old furnace are still standing. The mine is now the property of E. N. Fish, of Tucson, and has not been worked since Mowry was compelled to leave the country. The ores must have paid enormously to enable Mowry to work them under such tremendous difficulties as he encountered. In the midst of hostile Indians he was compelled to maintain a large force for defense. His nearest base of supplies was 800 or 1,000 miles distant, and much of the distance a desert, destitute of water or feed for stock. It seems almost incredible that he should have obtained machinery and supplies necessary for such an enterprise. It is only within the last six months that Patagonia has become known and attracted any attention. Previous to that time the existence of mines there seems to have been forgotten except by a few persons. Harshaw and his associates were, for a long time, the only persons in the district, and they still retain an interest in their group of mines lately sold to Col. Gillette and others. Eastern capitalists have also purchased some valuable mines and reduction works will soon be erected on an extensive scale.

A number of mines have been bonded for the Eastern market, and in a short time all the promising mines will be in the hands of capitalists who will lose no time in developing them. There is no mining region in the world that presents so many inducements for the investment of capital as this. The ores are rich and work freely, requiring no flux. The ore bodies are large and solid all; the workings may be made in solid ore and no waste rock to handle or dispose of. Fuel is abundant and cheap, labor is cheap, bricks for building may be had for $13 per 1,000 or less.

The railroad will soon pass within 40 miles of the mines, and a good wagon road can be made to the railroad for a few hundred dollars, or freight can be hauled from Tucson for one cent per pound.

Large quantities of ore are exposed on the surface, and wherever shafts have been sunk the ore improves as it goes down.

The Glacier claim has a shaft 50 feet deep, from which the ore was formerly taken by Mexicans, and packed on donkeys five milee to the Santa Cruz river, where it was worked in arastras. The bottom of the shaft still shows rich ore over the whole surface eight feet square.

The Holland mine has a shaft 100 feet deep, and in solid ore all the way. In fact there seems to be no limit to the quantity of ore obtainable, and the time is not far distant when the bullion product of Patagonia district will astonish the world. J. W. W.

Mechanism Shown at Stockton Fair.

EDITORS PRESS:—In proportion to the population there is probably no place on the Pacific coast that has contributed so many useful inventions as Stockton, the city of windmills, the seat of numerous prosperous manufacturing industries. Windmills, plows, harrows, derricks and electric elevators, fanning mills, threshers and harvesters, feeders, self-oiling boxes, composition metals, adjustable car traction, pumps, patent medicines, etc., etc., have been produced here and find favor in a wide market.

While busy with invention, Stockton people are quick to discern and adopt valuable inventions originating elsewhere, and not slow to improve upon them when adopted. Marster's threshing machine feeder is an example. Patent feeders work machines at the very top of their capacity, and the present separator is hardly up to the mark. Mr. Lissendsn, proprietor of the Pacific Agricultural Works, tells us of two important inventions tested the past season, one of which is an agitator that catches the straw as it comes from the cylinder and prevents bunching; the other is a cleaner at the tail of the separator that saves almost the last kernel of grain. They will be placed on the market another season, and will be comparatively inexpensive.

The Follansbee double propeller pump was shown in Stockton for the first time in 1878, and its power in discharging water found it favor with all who saw it. Its triumph was short, however, for two lean thinkers of the Cassius order conspired and invented the Norton single propeller pump, which overthrew the sovereignty of the Follanshee pump before fairly established. This single propeller pump was shown at the last Mechanics' fair in San Francisco, and won from Superintendent Gilmore the praise of being the most useful and important invention exhibited. It was one of the most meritorious inventions shown at the San Joaquin fair, and elicited many inquiries and frequent tests of its capacity.

Its pumping capacity has been hastily estimated as follows:

4 inch pump.....	500	gallons per minute.
6 " "	1,000	" " "
8 " "	2,500	" " "
10 " "	3,500	" " "
12 " "	4,500	" " "

In actual use it has been found to do much better than this. An eight-inch single propeller pump is in use at the Alameda bath-house to pump water from the bay into two bath-rooms. These rooms together have an area of 143,000 square feet, nearly one acre. In four and a half hours time the pump will fill these rooms one foot in depth, which shows a pumping capacity of over 3,900 gallons per minute. There is a large 12-inch pump, owned by T. B. Bigelow, on Rough and Ready island. It was tested there (an 8-inch) in competition with the Centennial and the Follanshee pumps, and showed such marked superiority that it was retained in preference to the other two. A four-inch pump can be purchased for about $150, and he operated by two horses. These pumps will be found of great value in irrigation, pumping from streams over high banks, from mines and from the holds of leaking vessels. A company, with Mr. John Jackson at the head, has been formed in Stockton to manufacture these pumps, and when it commences operations we shall give further notice.

Sub-Irrigation.

One of the most important links in the problem of irrigation is the Abestine sub-irrigation system, invented in 1876 and patented in 1879, by E. M. Hamilton, of Los Angeles. The system consists of pipe laid in trenches, about a foot beneath the surface of the ground, out of the way of the plow. The pipe is laid at various distances apart, according to the crop to be irrigated, and is made of sand, lime, cement and water, and hardens in 24 hours so as to carry water.

The machine for making the pipe, while simple in construction and operation, is difficult to describe. It consists of sheet-iron pipe, of from 3 to 6 inches in diameter, according to the diameter of the cement pipe desired, and 3 feet in length; this is placed horizontally in the trench. Another piece of pipe, 2 feet in hight, and standing upright, with a funnel-shaped mouth for receiving the sand and cement mixture, is fitted on the horizontal pipe near the back end, and serves as a feeder. The horizontal pipe is open on the lower side, and on the inside are grooves, one on either side, coming together in a V-shape, with the apex near the mouth. On the back end of the horizontal pipe is an upright lever, three feet in length, fastened on a pivot above, and the lower end attached to a rack-plate moving through the slotted grooves opening and closing the pipe as the lever is moved back and forth. Also attached to the lever is a rod, that moves back and forth with the lever and makes the bore in the sand and cement pipe. With each stroke of the lever the machine is propelled backward from 2 to 5 inches, shaping so much pipe. Three men are employed—one to mix the material, one to feed the machine, and one to operate the machine. As soon as the cement pipe is made, and before hardening, holes are made in the top with a conical piece of wood or iron, and in these holes are inserted cork-shaped pieces of wood with holes burned through lengthwise, through which the water rises to saturate the ground. A 5-inch pipe, about a foot in length, is usually set upright over each hole, to prevent earth and roots from clogging it.

We timed a test of the machine in operation on the grounds, and recorded 11 feet of pipe made in 1½ minutes, or at the rate of 440 feet per hour. In field work, including angles and elbows, and working in a trench, 1,600 feet to 2,000 feet is a day's work. The cost is estimated at about one-half cent per foot, including labor. Mr. Hamilton tells us the usual cost per acre for an orchard is $15 to $25, and when once laid down will last indefinitely. The advantages of this system are in the ease and certainty with which the water can be regulated; the saving of from three-quarters to nine-tenths of the water, as used in surface irrigation; the prevention of the baking of the surface, and a chilly, disagreeable night air; and the advantage of a loose, mellow, dry surface, with few weeds. The water supply coming from beneath, induces a downward growth of the roots, out of the way of the plow. Fertilizers may be dissolved in the tank or pond, and carried direct to the roots of the trees. In vineyards, perhaps, poisons may be introduced in the water, and thus reach the phylloxera.

Well Boring.

Messrs. Haas & Manning are boring a deep well in Stockton, on Hunter street, near Main. Mr. Haas is using the steam well-borer, which is working admirably, and has penetrated to a depth of 690 feet, striking a small flow of water at 650 feet. It is calculated that at 750 feet a strong flow will be struck. A reamer is used ahead of the pipe, and steam jacks are used to sink the casing. Two wells 200 feet deep and one 550 feet deep were bored by this well-borer at the Stockton paper mills, getting a good stream. One of these steam well-borers was sent into Santa Clara county, but we never heard that it accomplished anything; and another to Los Angeles county, where it was hindered, and it is claimed to have been finally broken up through jealousy of rival well-borers. Mr. Haas is an excellent professional engineer, cool and prudent, and the machine has never failed to work satisfactorily under his management. We venture to assert that he will strike water with the steam well-borer anywhere between the San Joaquin river and a line drawn from Merced City through Modesto to Linden in San Joaquin county.

H. E. HALLETT.

COPPER IN MAINE.—The *Northwestern Miller* says: A copper belt, some two miles long and from 200 to 400 feet wide, has been discovered about the middle of the southern part of Maine, directly on the coast. Some 20 miles to the northward of the copper belt, silver has been found in flakes, masses and filaments. A shaft has been sunk some hundred feet deep, and it is reported that the ore increases in richness with the depth.

Utilizing Blast-Furnace Slag.

The London *Times* says that slag accumulates in the iron-making districts of Great Britain at the rate of nearly eight millions of tons per annum. Various schemes have been undertaken to utilize this vast quantity of apparently useless material without success, until recently Mr. Charles Wood, of Middlesbrough-on-Tees, after five years of careful study and experiment, has succeeded in effecting the conversion of blast-furnace slag into various forms, and in applying it to several industrial purposes upon a practical and commercial scale. At the time when he started upon his investigations there was no instance of slag being manufactured into a commercial commodity in this country, its only known application being that of road making. Mr. Wood, however, has succeeded in utilizing it for the manufacture of building bricks, concrete, cement, mortar and slag wool.

To prepare it for the various forms it is to assume, the slag is converted into sand and to accomplish which it is run from the blast furnace into a hollow wheel revolving upon a horizontal axis and fitted with iron buckets in side. A bath of water is maintained inside the wheel at the bottom, and is kept in a state of violent agitation by the revolving action. As the molten slag enters the body of water it is immediately disintegrated and assumes the form of sand, the water taking up the heat from the molten slag and giving it off in the shape of steam. A constant flow of water is maintained into the machine, and the sand is separated from it and elevated to the top of the machine by the bucket plates, which are perforated. Arrived at the upper part of the machine, the slag sand is dropped into a spout, and thence finds its way into wooden wagons, by which it is conveyed to the slag works for manufacture.

At the works the slag sand is mixed with selenitic lime and the mixture thoroughly incorporated in the pug-mill of a brick-making machine. After which it is pressed into bricks at the rate of about 12,000 per day. After about six weeks hardening in the open air the bricks are ready for market. They are very tough and do not split when a nail is driven into them, some of them having withstood a pressure of 20 tons.

In another department the manufacture of artificial stone is carried on, the stone molded into chimney-pieces, window-heads, balustrading, and outside ornamental builders work generally. The stone is composed of two and a half parts of finely pulverized slag, and two and a half parts of ground brick to one part of Portland cement. The mixture is run into molds and set quickly, the articles being ready for the market in four or five days. Besides bricks and stone articles, the slag is used for making mortar, cement and concrete. The mortar is a mixture of slag and common lime, the cement being composed of the same materials with the addition of iron oxides. Slag cement also forms the subject of a recent invention by Mr. Frederick Ransome, which is referred to in another column.

Perhaps the most beautiful, and certainly not the least remarkable, outcome of blast furnace slag is slag-wool, or silicate cotton as it is also called, owing to its resemblance to cotton-wool. The process originated, we believe, with Messrs. Siemens Brothers, on the Continent, and the manufacture has been before attempted in England, but as far as we are aware, has not succeeded. As carried out by Mr. Wood at the Tees Ironworks, a jet of steam is made to strike against the stream of viscous molten slag as it is run off from the blast furnace. This jet scatters the molten slag into a stream of shot, which is projected forwards near the mouth of a large tube, in which a couple of steam jets cause an induced current of air. This tube opens into a receiving chamber, composed chiefly of wire gauze, and measuring about 33 feet long by 15 feet wide, and 12 feet high. As each shot leaves the stream of slag it carries a fine thread or tail with it. The shot, being heavy, falls to the ground, while the fine wholly fiber is sucked through the tube and deposited in the chamber. The appearance of this chamber after a charge has been blown into it is singularly beautiful. Not an inch of floor, sides, or roof but is covered with a thick layer of the downy silicate cotton. This cotton is made into mattresses and also used for covering steam boilers, as well as for other purposes where it is desired to prevent the radiation of heat. For this purpose slag-wool is eminently adapted, as it is a very bad conductor of heat, and is moreover perfectly incombustible.

Another useful purpose for which blast-furnace slag has been successfully utilized is that of glass manufacture. The vitreous character of slag indicates a resemblance to glass in its composition. It does, in fact, contain the principal components of glass, but not in proper proportions, and those in which it is deficient have therefore to be added with others which are not present, for example, sand and alkalies. The glass produced is said to be stronger than ordinary glass, and the color can be varied as required, the natural tint being green. A new method of toughening glass has recently been discovered by Mr. Frederick Siemens, of Dresden, and it is proposed to apply this process to slag glass for the purpose of manufacturing railway sleepers and other articles. Details of Mr. Siemens's process are not at present at hand, but, judged by results, it would appear to differ from that of M. de la Bastie, inasmuch as when the toughened glass is broken it does not fly into minute atoms as does De la Bastie's, but simply fractures, somewhat similar to cast-iron.

MECHANICAL PROGRESS.

Hydrometer Vessel.

A new apparatus for propelling vessels has been recently patented in Germany by Dr. Fleischer, and a vessel called the *Pellworm* has been constructed for the purpose of testing the apparatus. The craft is propelled without engine, paddle wheels or propeller, and it is steered without a rudder. The invention is based on the principle of hydraulic reaction, and it embodies several novel and valuable features, which, according to the reports that have reached us, have rendered the hydrometer a success.

The use of a reactive jet of water as a means of urging a vessel forward is not of itself new, but the means employed by the inventor of the hydrometer to draw the water in and eject it are quite novel.

Two cylinders are connected with the steam boiler by suitable pipes, and the steam supply is controlled by the valve. Each steam cylinder has two suction pipes, and two discharge nozzles connected with cylinders by pressure pipes. The suction pipe is provided with a valve, and the discharge pipe has also a valve. Below the cylinders and between the discharge pipes there is a condenser, having connected with it the air and feed pump. The steam used in the cylinders passes through superheaters which surround the chimneys, and its admission to the cylinders, through the valves, is controlled by a float in each cylinder.

The discharge nozzles are swiveled so that they may turn in any direction, and thus control the course of the vessel by changing the direction of the propelling force.

The great difference between this apparatus and its predecessors is that the steam pressure acts directly upon the surface of the water without the intervention of pistons or intermediate machinery. Friction, complications, expense of repairs, liability to breaking, are in a great measure, if not entirely, avoided, and it is said that the method of applying the power has proved highly economical and satisfactory. The boilers of the *Pellworm* and their appurtenances are precisely like other boilers. The steam is admitted to the upper part of the cylinders through the valves, which are controlled by floats, as before observed. The steam forces the water out through the discharge nozzles with considerable velocity, and the reactive force carries the boat forward. The steam is cut off at the early part of the stroke, and the expansive force completes the work. It may be imagined that considerable loss of power might arise from condensation in the cylinders, but as the water is covered with a film of oil, and a certain amount of oil and hot water clings to the surface of the cylinders and covers the inflowing water, the loss is slight. When the water in the cylinders reaches the prescribed level the exhaust valve communicating with the condenser is opened, and as the vacuum is formed water enters the cylinders through the supply valves, and the operation is repeated.

The *Pellworm* is 75 feet long, 12 feet beam, draws 3½ feet of water, is flat bottomed, and is capable of steaming 6 knots per hour. The apparatus develops 25-horse power, and 40% of power of the steam is realized in the propulsion of the boat.

Electric Drawing Apparatus.

An apparatus has been devised by M. M. Bellet and Hallez d'Arros, of Paris, for obtaining by means of electricity autographic stencils of writings and designs capable of being reproduced by lithography or upon metals by the acid-graving processes. A small Ruhmkorff coil, arranged in the following manner, is employed: A metal plate is united to one of the poles by means of a wire, and the other pole is connected to the core of an ordinary blacklead pencil or suitable point by means of a very fine wire. On the metal plate is fastened by means of gum a thin sheet of paper previously dipped in water containing sea salt. The induction coil is then set in action, and the design it is required to reproduce is drawn on the paper attached to the metal plate with the pencil (or point), by which means the two poles are brought together, and the electric sparks dart continuously from the point of the pencil or point, and produce on the thin paper small holes corresponding with the lines of the design. The metal plate should be placed on some insulating substance. The design or writing thus finished, the metal plate is dipped in water and the paper carefully removed. The stenciling thus obtained, it is easy to transfer it to stone by inking a sheet of paper with transfer ink, and then placing the stencil thereon, and covering it with a sheet of white paper, and pressing it sufficiently for the ink to pass through the holes in the stencil. A proof is thus obtained which can be transferred in the ordinary way. The transfer can also be made on zinc, by which a typographical stereotype may be obtained. In order to obtain an engraving or etching on metal it is necessary to proceed as follows:

A well polished copper plate is covered with a thin layer of varnish. On this varnish a sheet of thin paper or suitable material is pressed, and upon executing the writing or design thereon with the electric pencil or point the electric spark will penetrate the paper and varnish at the same time, and leave the metal bare at all parts touched by the pencil or point. The plate is then dipped in a nitric acid bath of 20°; the acid will attack the metal where not covered with varnish, and after two or three minutes' immersion an engraved plate is obtained from which a great number of copies can be produced, "exactly similar to etchings obtained by engraving on metal."

LARGE CRANK SHAFTS.—At the late meeting of the Institution of Mechanical Engineers, at Glasgow, a paper was read "On the Forging of Crank Shafts," by Mr. W. L. E. McLean, of the Lancefield Forge. The author gave an interesting account, well illustrated by diagrams, of the methods of forging large crank shafts generally in use, and especially of the building-up system, which had for many years been adopted at the Lancefield Forge, an establishment which, as is well known, has a high reputation for this class of work. In the discussion that followed, Mr. Jamieson believed that at no very distant day the Atlantic steamship service would be such that it would be possible to leave Great Britain early in the week and arrive in New York at the end of the week; but this of course would necessitate the employment of larger vessels and more powerful engines. He had had considerable experience in the building up of large shafts in several pieces, and the firm with which he had lately been connected (Messrs. J. Elder & Co.) had constructed in this way a shaft weighing 56 tons, this being a three-throw shaft and built up of 15 pieces. Within the next 10 years, shafts weighing 100 tons would, he considered, probably be required, and he believed that the proper way to construct such shafts was to build them up, a shaft so built up involving much less loss of time for repairs or renewal, in the event of failure, than would be the case with the old shafts.

ELECTRICITY IN THE APIARY.—A correspondent of the *Deutsche Presse* has adopted electricity as a successful means of overcoming the difficulties in handling bees. Trials on large and small clusters, and even on single insects, answered perfectly; the bees coming in contact with the conducting wires fell stunned and motionless to the ground. They were then sorted and marked, according to the strength of the current applied. The time required for their recovery varying from ten minutes to eight hours, was proportionate to the strength of the shock, but all came out of their trance safe and sound. Encouraged by the result of this experiment, Herr Freiwith resolved to try it on a larger scale, namely, on bees in the hive. To this end he introduced the ends of two conducting wires into a fully occupied honeycomb, and turned on the current for a moment; the bees soon lay on the ground, and it was half an hour before they resumed activity. Herr Freiwith then constructed an apparatus in a small box, six inches each way, which, similar to a cartridge pouch, he wore with a strap round his body. The two wires of the apparatus were, when required to be used, fastened to rods of a suitable length, the wires, of course, always projecting over the ends of the rods. These ends were then applied to the swarm, a knob similar to that employed for a room-telegraph being attached to the apparatus, that the current might be turned on at the proper moment.

NEW CRUSHER.—The Blake Crusher Company, of New Haven, have recently perfected a new machine, called the Challenge Rock Breaker, or Sectional Cushioned Crusher, and in examining its construction we can only wonder how the old machine could have given such universal satisfaction for so many years when there was so much room for improvement. In the new Blake all tensile strains are upon wrought iron or steel, instead of cast iron, as in the old machine. It is sectional, and the weight of the heaviest piece of the largest crusher is only 2,400 pounds. It has double the strength of the old form and at the same time its construction is such that it possesses a high degree of elasticity. The first large machine made by the Crusher Company, was tested by throwing between the jaws a steel sledge, while the machine was running 200 revolutions per minute. This test, which would have broken any form of crusher hitherto made, simply stopped this machine without damaging it. The stroke of the jaws may be maintained at any desired length, whatever wear on the toggles, etc., may have been. It is only two-thirds the weight of the old crusher, thus reducing the cost of freight, and is in addition cheaper in price than its predecessor.—*American Machinist.*

NEW METHOD OF SUPPLYING WATER.—The *American Manufacturer* says an important patent has recently been issued, which promises, it is said, to do for cities and towns what the driven well has done for houses and factories, in revolutionizing their water-supply systems. The patent consists in one or more series of driven-well combinations, a common section pipe, connecting the well tops and ending in a suction pump which, it is claimed, will furnish a liberal supply of water for public use. The working of the pump brings into the wells subterranean water deposits, thus making them a substitute for a reservoir and eradicating local impurities. The invention is founded on several discoveries, resulting from recent experiments at Holyoke, and the advantages claimed are the best possible for fire service, and a continuous and abundant supply of absolutely pure water at a small cost. The discoveries suggesting the patent were, that continuous pumping purifies objectionable water, and that a simple gang of the driven wells can be made a substitute, and more than an equivalent for a reservoir, avoiding expensive embankments, conduits and land damages, and all risks incidental to inclosed surface waters.

SCIENTIFIC PROGRESS.

New Pencil as a Substitute for Ink.

We do not refer here to the aniline pencils which have been in use for some time, but to a quite different pencil which gives a very black writing, capable of being reproduced by the copying machine, and which does not fade on exposure to light. The mass for these pencils is prepared as follows: 10 pounds of the best logwood are repeatedly boiled in 10 gallons of water, straining each time. The liquid is then evaporated down till it weighs 100 pounds, and is then allowed to boil in a pan of stoneware or enamel. To the boiling liquid nitrate of oxide of chrome is added in small quantities, until the bronze colored precipitate formed at first is redissolved with a deep blue coloration. This solution is then evaporated in the water bath down to a syrup, with which is mixed well kneaded clay in the proportion of one part of clay to three and one-half of extract. A little gum tragacanth is also added to obtain a proper consistence.

It is absolutely necessary to use the salt of chrome in the right proportion. An excess of this salt gives a disagreeable appearance to the writing, while if too little is used the black matter is not sufficiently soluble.

The other salts of chrome cannot be used in this preparation, as they would crystallize, and the writing would scale off as it dried.

The nitrate of oxide of chrome is prepared by precipitating a hot solution of chrome alum with a suitable quantity of carbonate of soda. The precipitate is washed till the filtrate is free from sulphuric acid. The precipitate thus obtained is dissolved in pure nitric acid, so as to leave a little still undissolved. Hence the solution contains no free acid, which would give the ink a dirty red color. Oxalic acid and caustic alkalies do not attack the writing. Dilute nitric acid reddens, but does not obliterate the characters.—*Moniteur Scientifique.*

BOOKS OF OLDEN TIME.—From the opening of the ninth century, parchment took the place of papyrus. Ancient books were rolled instead of being in square form, as we have them. About this time paper made from cotton and linen rags began to be made, but its manufacture was so limited that the facility for copying was not much increased. All writing material was exceedingly scarce in that age, and had the invention of printing dated earlier, it could not have made any substantial progress on this account. In many instances the only way to issue a new work was to erase the original writing from a manuscript, and then to trace another book upon the same parchment. Thus the writings on many valuable manuscripts were destroyed, and some even more valuable than those which took their place. Written language had almost perished for the want of material upon which to record the burning thoughts which were struggling for expression. The books of those days were written out by hand, and the work of the copyists was both honorable and lucrative. They were generally employed by booksellers on a salary. The rich employed favorite slaves to copy works of antiquity and of their own times, for their own libraries. Orators secured the copying of their own discussions; and the government, of its edicts.

DISCOVERY IN PHOTOGRAPHY.—The Cincinnati *Commercial* says that Judge Longworth, after months of experiment, has discovered the process used by a few old-world photographers in the preparation of sensitized or dry glass plates. The value of this happy result cannot be overestimated. By the method referred to the amateur or landscape photographer can now prepare the plates at home in any number desired, stow them away in a valise, and taking with him a portable camera and folding tripod, start out on his labors unencumbered with chemical bottles and other endless supplies. Another and very important advantage arising from the discovery is the fact that the negative can be taken almost instantaneously, the Judge having secured faultless pictures of sailing boats in motion. Landscape views by this means do not possess the blurred look occasioned by the restless foliage. The artist now on his country rambles when meeting with a bit of scenery especially pleasing to his eye, can set the tripod, place it on the camera, draw the slide, raise the curtain, let it fall and the work is done. The plate is then placed away in darkness for treatment on reaching home, and the artist, with a loss of but three minutes' time, moves on to other scenes.

IMPROVED TELEGRAPH.—Prof. Klinkerfues, the director of the observatory at Gottingen, has patented a new telegraphic invention by which it is said to be possible to send as many as eight messages simultaneously along the same wire. A portion of the invention is an apparatus which simultaneously writes down all the messages as they arrive at the station to which they are addressed.

A DISCOVERY IN GUNNERY.—The Pall Mall *Gazette* states in brief manner these recent developments in gunnery: It has been very clearly shown that by chambering a gun, or, in other words, by enlarging the portion of bore containing the charge, and by increasing the charge of powder, a much higher velocity can be imparted to the projectile, and consequently the power of the gun greatly augmented, without increasing the strain on the piece. A six-inch gun, for instance, has been recently constructed, weighing only four tons, but firing a charge of 36 pounds of powder, with a projectile of 80 pounds, which has proved itself to be nearly as powerful a weapon as the nine-inch service gun, weighing 12 tons and firing 70 pounds of powder. In a paper published in the "Proceedings of the Royal Engineer Institute," it is stated that other guns designed on the same principle will shortly be constructed; and it is anticipated that one of the new pieces, with a bore of 10-inch diameter and about 15 tons weight, will be able to take the place of the 12½-inch or 38-ton gun as an armor piercing weapon in the forts. In order, however, that all the increase of power derivable from the adoption of this principle of chambering may be obtained, it is also necessary to materially increase the length of the bore to allow of the whole of the increased charge of powder being consumed in it; and this, the writer of the paper referred to suggests, furnishes another argument in favor of the substitution of breech for muzzle-loading ordnance. A 10-inch gun on the new system, for instance, will be three feet six inches longer than the service 12½-inch or 38-ton gun; and the extreme difficulty, if not impossibility, of loading so long a piece at the muzzle would preclude it being used in our casemates without crippling its efficiency by shortening the bore.

SLAG CEMENT.—Mr. Frederick Ransome, of England, has discovered that blast-furnace slag furnishes a cement which is free from the objections made to the Portland cement, when used for decorative purposes. From blast-furnace slag he produces a cement which is perfectly white, and in addition, possesses a strength greater than that of Portland cement. Although the new cement is colorless in itself, it is capable of receiving and retaining any tint that may be imparted to it, which is a valuable feature. The slag is reduced to sand or granulated and then mixed with from one to two parts by weight of chalk or limestone, and burned at a moderate temperature. The result is an excellent hydraulic cement, possessing great strength, and having a pure white appearance. Owing to the circumstance that the slag-sand has already undergone a process of burning in the blast furnace, the cement does not require so high a temperature to be used in its manufacture as it otherwise might. From a series of comparative experiments recently carried out with slag and Portland cements, it was found that samples of Portland cement two days old gave way at 510 pounds, whilst samples of Mr. Ransome's cement of the same age did not give way until 740 pounds had been reached. In another instance, a sample of the Ransome cement 21 days old gave a breaking strain of 1,440 pounds, whilst a sample of Portland cement seven years old only stood up to 1,327 pounds, and then broke. The samples were all one and a half inches square at the breaking point, thus giving a sectional area of two and one-quarter square inches.

EFFECTS OF PRESSURE ON VARIOUS SUBSTANCES.—It is stated that a member of the Belgian Academy of Science, Mr. Spring, has made some experiments on the effect of pressure on powdered substances. He is said to have subjected, amongst other things, a quantity of powdered poplar wood to a pressure of 20,000 atmospheres (about 280 tons per square inch). The result was a block having greater hardness than the natural poplar wood, and having a specific gravity of 1.328, while the natural wood has a specific gravity of only 0 389. There must be an error here in the statement of the pressure. Twenty thousand atmospheres would be 300,000 pounds, or only 150 tons per square inch. We understand that Mr. Edison has lately made some interesting experiments with high pressures. Among other things we are told that he has subjected alumina (clay) to a pressure of 80,000 pounds per square inch (40 tons), the result being the production of a substance so hard and sharp that it cuts glass.—*Scientific American.*

SILVERING MIRRORS.—An improvement in silvering mirrors, by which excellent results are obtained, and which at the same time spares the workmen the danger of exposure to the effect of mercurial vapors, has just been accorded a prize of 2,500 francs by the French Academy. The inventor is M. Lenoir, and his procedure is substantially as follows: The glass is first silvered by means of tartaric acid and ammoniacal nitrate of silver, and then exposed to the action of a weak solution of double cyanide of mercury and potassium. When the mercurial solution has spread uniformly over the surface, fine zinc dust is powdered over it, which promptly reduces the quicksilver, and permits it to form a white and brilliant silver amalgam, adhering strongly to the glass, and which is affirmed to be free from the yellowish tint of ordinary silvered glass, and not easily affected by sulphurous emanations.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Sept. 25		Week Ending Oct. 2.		Week Ending Oct. 9.		Week Ending Oct. 15.	
Alpha	20¼	17½	17¾	14¼	17⅞	16	16¾	16½
Alta	6⅝	6	6	5¼	5½	5	6	5
Andes	1.60	1.05	1.20	95c	1.20	1.05	1.30	1
Alps	....	....	....	....	....	....	....	....
Argenta	1.10	75c	1.60	90c	85c	75c	1.05	75c
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	20c	....	....	....	....	....	10c	....
Baltimore Con	....	....	....	....	....	....	....	....
Belcher	4.60	4¼	4⅜	3.60	3.85	3.65	4.60	3.65
Belmont	60c	....	65c	60c	65c	50c	1.10	50c
Best & Belcher	19⅝	17¾	18⅜	17¾	17½	16⅝	19¾	17½
Bullion	8	7¼	8¼	7⅛	10	8	8⅝	7⅛
Bechtel	1½	1.40	1¼	1	1.15	1	1½	1⅛
Belle Isle	5½	4¾	5⅜	4.85	4.95	4.05	4.65	4.10
Bodie	14½	13¾	14	13¼	13¼	10¼	13	12¾
Benton	3¾	3¼	3.40	2⅝	3	2.85	3½	2¾
Bulwer	12¾	11¼	12	11¼	11¼	11	12	11½
Boyle	....	....	....	....	....	....	....	....
Black Hawk	1	80c	1	75c	1.10	75c	95c	75c
Belvidere	90c	80c	85c	80c	1⅜	80c	85c	50c
Booker	1¼	1.05	1	95c	80c	55c	90c	60c
Caledonia	2½	1¾	2⅝	2	2.40	2.15	2¼	2.20
California	6½	5¼	5½	5¼	5⅝	5¼	6¼	5
Challenge	2.30	....	2.30	2.10	2¼	2.10	2.40	2
Chollar	7¼	6¾	7¼	6⅝	7	6⅝	7¾	6¾
Confidence	10¾	10½	10¾	9	10	9	10¾	9¼
Con Imperial	1¼	1.45	1.35	1.20	1.30	1.20	1¼	1.05
Con Virginia	6¼	5¼	5½	5¼	5⅝	5¼	6¼	5
Crown Point	3.70	3¼	4.30	3⅜	4.20	4	4.45	4.10
Con Washoe	....	....	....	....	....	....	....	....
Champion	30c	20c	40c	30c	30c	25c	25c	20c
Concordia	5c	....	20c	....	....	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	60c	45c	1½	55c	1.30	1.10	1.15	70c
Eureka Con	25¼	21	26	22¾	25¼	24¼	28	20
Exchequer	6⅝	5¾	6¼	5	6¼	5¼	6	5¼
Endowment	50c	40c	55c	35c	50c	....	55c	50c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	2½	2	2.55	2	2.10	2	2.20	2
Gila	35c	30c	25c	15c	25c	20c	30c	25c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	....	....	13	12	13	....	12½	12
Goodshaw	35c	25c	40c	25c	30c	20c	35c	30c
Gould & Curry	12	11¼	11¾	9⅝	10¼	9¼	12	10
Hale & Norcross	14½	13¼	13½	11⅞	12¾	11¾	15⅞	13¼
Hillside	2	1.85	1.85	1¾	2	1¾	1.90	1¾
Highbridge	....	....	....	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	5c	....	15c	....	15c	10c	15c	....
Independence	2.10	1.80	2	1¾	1¾	1.55	1⅞	1½
Julia	4.55	4.10	4¼	3¾	4.05	3.80	4.10	3¾
Justice	4	3.55	3¾	3.20	3.30	3.05	3¼	3.10
Jackson	4½	4	3.90	....	4½	4	4	....
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	1	....	....	....
Kentuck	4½	4¼	4.30	4.20	4.15	4	4.40	4
Kossuth	....	....	....	....	....	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	1.10	45c	1	70c	1	75c	90c	75c
Lady Wash	1.20	1	1.05	99c	1	85c	1.10	20c
Leopard	60c	10c	60c	55c	60c	....	55c	50c
Leviathan	60c	50c	60c	45c	60c	50c	60c	55c
Leeds	75c	....	65c	....	60c	....	....	....
Lee	....	....	....	....	....	....	....	....
May Belle	25c	....	....	....	....	....	....	....
Modoc	1¼	1	1¼	1.20	1	....	1	90c
Manhattan	3¼	....	3	....	2¾	2¼	2¾	....
Martin White	3¼	2	2	1.90	2	1½	1¾	1⅝
McClinton	80c	50c	65c	60c	65c	60c	65c	30c
Meadow Valley	50c	....	5c	....	5c	....	5c	....
Mexican	38¾	37	37	31	32¾	31¼	43¾	32½
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	3	....	....	....
North Con Virginia	8⅞	8½	9	3	9½	8	9½	....
New York	65c	60c	60c	45c	55c	40c	60c	40c
Northern Belle	4	3⅞	3.95	3⅞	3⅞	3½	4	3.60
New Coso	....	....	....	....	....	....	....	....
Navajo	40c	30c	40c	30c	50c	35c	65c	40c
Occidental	5¼	2.60	3½	2.10	2⅜	2.30	2½	2¼
Ophir	44	42	43½	36	36½	33	38½	34½
Oriental	20c	15c	15c	....	15c	10c	40c	10c
Overman	9½	9	9¾	8⅞	9½	9	9⅞	9
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	....	....	....	....
Phil Sheridan	40c	....	40c	....	25c	20c	60c	20c
Potosi	6	6⅞	6	5½	6¼	5⅝	6½	5⅝
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	1¼	95c	1¼	1.10	1¼	1.10	1¼	1.15
Richer	....	....	....	....	....	....	25c	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	14⅞	13¾	14½	12	12⅞	11¾	14¾	12½
Seg Belcher	24	22	22	....	....	....	....	....
Sierra Nevada	48¾	46¾	49	42¾	49¼	47	86½	50
Silver Hill	1.65	1.40	1½	1¼	1½	1¼	2	1.30
Silver King	4¾	4¼	6	5¾	6	5	6	....
Silver Prize	....	....	....	....	....	....	....	....
Succor	5c	....	....	....	....	....	....	....
Summit	2	1½	1¾	1½	1½	1½	1.80	1¼
Scorpion	4	2.95	3.80	3.10	3.60	3.30	6⅞	3.40
Solid Silver	65c	25c	50c	30c	30c	....	30c	15c
South Bodie	30c	25c	25c	20c	25c	20c	20c	....
South Standard	5c	....	10c	5c	....	....	20c	....
Star	80c	70c	75c	50c	70c	60c	65c	50c
St. Louis	40c	....	....	....	30c	....	....	....
Syndicate	5⅞	5¼	5½	5	5	....	6¼	4.90
Tioga Con	3.70	3	3.05	2¾	2⅞	2.60	3½	2.60
Tiptop	1.05	1	1¼	1.10	1.20	1.10	1¼	1.10
Trojan	25c	20c	30c	20c	20c	15c	20c	15c
Union Con	74	70½	72½	61	67¾	64	94	70
Utah	20¾	19½	20¼	17½	20¾	19½	27½	20¼
Vermont Con	....	....	....	....	....	....	....	....
Ward	3.10	30c	3¼	2.90	3	2.70	2.85	2.65
Wells-Fargo	10c	....	5c	....	....	....	20c	10c
Woodville	40c	35c	....	....	40c	....	40c	30c
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	16⅞	16¼	16½	15	16	15	17	15½

Sales at S. F. Stock Exchange.

Friday A. M., Oct. 10.
45 Alta......5¼
630 Andes......1@1.05
160 Alpha......15½@16
350 Belcher......3¾@3.65
320 Benton......2.80
45 Best & Belcher......17¼
1645 Bullion......8@7⅞
250 Caledonia......2.40@2¼
140 California......5@5⅛
45 Confidence......9¼
95 Con Virginia......5@5⅛
200 Chollar......6⅞
1120 Con Imperial......1.20
40 Crown Point......4.20
180 C Dorado......2
220 Exchequer......5¼@5⅜
300 Fairfax......75c
955 Flowery......60c
860 Golden Gate......3⅛@3
175 Gould & Curry......10
95 Hale & Nor......13⅞@13¾
170 Julia......3¾
100 Kentuck......4
450 Lady Bryan......80c
260 Lady Wash......85@90c
250 Leviathan......60@55c
55 Mackey......90c
550 Mexican......33½@33
170 N Bonanza......1.40@1⅜
15 North Con Vir......9¼
340 New York......40c
310 Occidental......2.40@2¼
230 Ophir......35@34½
10 Overman......9
335 Potosi......5⅞@5⅞
100 Phil Sheridan......20c
410 Plutus......2.30@2.40
665 Sierra Nevada......50½@50
430 Scorpion......3.40@3.45
200 Silver Hill......1½
85 Savage......12⅞@12⅝
100 Trojan......20c
130 Utah......20¼@20½
535 Union Con......70@71
40 Ward......2.65
100 Woodville......40c
600 Wells Fargo......10c
80 Yellow Jacket......15½

AFTERNOON SESSION.
550 Adenda......40@45c
250 Albion......15c
200 Belmont......50c
305 Belle Isle......4.60@4.65
50 Black Hawk......95c
150 Booker......30@85c
50 Bulwer......11¼
50 Belvidere......80c
10 Bodie......12¾
600 Bechtel......1.15@1⅛
100 Big Prize......30c
400 Chammon......25@20c
170 C Pacific......7½@7⅞
50 Caledonia (B H)......2½
1020 Day......1.15@1.10
150 Dudley......1
290 Eureka Con......28@27½
140 Grand Prize......2@2.05
900 Goodshaw......35c
100 Hussey......15c
30 Independence......1⅜
240 Jupiter......90c@1
150 Leopard......50@55c
150 Manhattan......2⅝
290 Mammoth......7⅞@8¼
350 Meadow Valley......5c
80 Mono......6½
300 McClinton......65c
50 Modoc......1
60 Mt Diablo......6
300 Martin White......1⅞
1500 N Belle Is......35c
325 Navajo......55@65c
300 Noonday......3
240 N Noonday......2½
500 Oriental......15c
300 Orient......35@30c
30 Paradise......1.65
100 Queen Bee......20c
1090 Ray'd & Ely......1¼
15 Syndicate......4.90
100 Silver King......6
400 Summit......1.40@1.30
320 S Bulwer......40c
100 Star......50c
1300 Tuscarora......40@35c
640 Tioga Con......2.60
50 University......25c

Saturday A. M., Oct. 11.
70 Alpha......16@15½
25 Alta......5¼@5
365 Andes......1.10@1¼
175 Aurora T......10c
20 Best & Belcher......17¼
320 Bullion......8⅞@8¼
270 Belcher......3.70@3.80
800 Belmont......75c
190 Benton......2.85@2¾
220 Belle Isle......4.65
70 Booker......60c
5 Belvidere......86c
475 Bodie......13
50 Bechtel......1.15
300 Boston......1.45@1½
200 Bulwer......11½@12
180 Crown Point......4.10
1075 Con Imperial......1¼@1.20
500 California......5@5½
40 Con Virginia......5
90 Chollar......6⅞@7
330 Caledonia......2¼@2.20
40 Challenge......2.10
80 Champion......20c
50 C Pacific......7½
180 Crœsus......20c
1150 Day......1.05@1
165 Exchequer......5⅞@6⅞
330 Eureka Con......20
125 Endowment......50@55c
335 Flowery......55@60c
180 Fairfax......75c
125 Gould & Curry......10¼@10
1175 Golden Gate......2¾@2½
440 Grand Prize......2
220 Golden Terra......12½
800 Goodshaw......35c
110 H & Norcross......13⅞@13¾
70 Independence......1.70
120 Julia......3.60@3.85
235 Justice......3¼@3.10
70 Kentuck......4.05
170 Lady Bryan......80c
610 Lady Wash......90@85c
200 Leopard......50c
100 Meadow Valley......5c
790 Mexican......34½@34¾
110 Mackey......90c@1
140 Mount View......2.60@2¾
60 Metallic......80c
20 McClinton......60c
200 Mammoth......8½
100 M White......1¾
190 Mono......6½
305 New York......50@45c
630 N Bonanza......1.20@1
120 N Con Vir......9¼
555 Northern Belle......3.60@3.65
250 N Belle Is......35c
400 N Noonday......2½
330 Noonday......3
750 Navajo......55@65c
445 Ophir......36@35½
100 Occidental......2½
100 Overman......9
95 Oriental......10c
200 Orient......25c
250 Potosi......6⅞@5⅞
60 Phil Sheridan......25c
250 Paradise......1½
700 Queen Bee......20@15c
100 Raymond & Ely......1.20
710 Sierra Nevada......56@55
110 Savage......12⅞@12⅞
240 Silver Hill......1½@1.30
600 Scorpion......3.40@3½
50 Solid Silver......15c
300 Star......55@60c
200 Summit......1.40@1½
180 Syndicate......5
100 Silver King......6
200 S Bulwer......40c
1140 Tuscarora......35@40c
50 Tioga......2.95
145 Tiptop......1.10
250 Utah......21⅞@22
520 Union Con......78½@80½
150 Woodville......40c
420 Ward......2⅞
300 Wells-Fargo......10c
40 Wales......16½
55 Yellow Jacket......15⅞

Monday A. M., Oct. 13.
220 Alta......5⅞@5¼
380 Andes......1¼@1.30
100 Alpha......16¼@16
200 Belcher......4@4.20
155 Best & Belcher......18½@19
220 Benton......3
1050 Bullion......8⅞@8½
20 Confidence......9¾
190 California......5¼
1635 Con Imperial......1.20@1¼
285 Con Virginia......5¼@5½
200 Chollar......7¼
525 Crown Point......4.15@4.30
320 Caledonia......2.20@2½
250 Challenge......2.10@2.15
400 Exchequer......5⅞@6
150 Fairfax......80c
610 Flowery......50@55c
1625 Golden Gate......2½
410 Gould & Curry......11@10⅞
210 Hale & Nor......14⅞@14½
110 Julia......3.90
205 Justice......3¼@3.15
40 Kentuck......4¼
150 Lady Wash......95c
230 Lady Bryan......75@90c
200 Mt View......2.60@2⅞
900 Mexican......39@38½
120 N Bonanza......1.35
25 North Con Vir......9½
35 New York......60c
385 Ophir......37½@36½
250 Occidental......2¼@2½
100 Overman......9
300 Phil Sheridan......35c
380 Potosi......6½@6
100 Savage......14
350 Solid Silver......20@15c
2185 Scorpion......4½@5
1195 Sierra Nevada......67½@70½
300 Trojan......15c
1000 Union Con......94@89½
645 Utah......26@24
200 Wells-Fargo......10c
50 Woodville......30c
330 Yellow Jacket......16⅞@17

AFTERNOON SESSION.
50 Addenda......50c
1975 Argenta......1@1.05
1350 Albion......15@20c
310 Belmont......65@75c
580 Belle Isle......4.60@4.55
160 Bodie......13
460 Bechtel......1.20@1½
50 Booker......90c
100 Black Hawk......90c
1000 Boston......1.45@1⅜
70 C Pacific......7⅞@7¾
800 Champion......20c
975 Day......95c@1
120 Dudley......95c@1
175 Eureka Con......26¼@26½
120 Grand Prize......2
100 Goodshaw......30c
50 Hussey......15c
290 Hillside......1.90@1⅞
180 Independence......1.65
150 Jupiter......90c
460 Leopard......50c
50 Mt Diablo......7
150 Mammoth......8
790 M White......1¾
130 Mono......6¼@6½
500 Metallic......80@75c
350 Northern Belle......3⅞
500 Noonday......3
950 N Belle Is......35c
500 Navajo......55@60c
2420 N Noonday......2½@2.60
1650 Oriental......20@10c
650 Paradise......1½
300 Queen Bee......15c
700 Raymond & E......1¼@1.20
200 Summit......1¼
250 Syndicate......5⅞@5⅞
150 Star......65c
100 S Bulwer......35c
350 Tiptop......1.10@1.15
690 Tioga Con......3.05@3.10
40 Tuscarora......40c
1300 University......25c
600 Wales......12

Tuesday A. M., Oct. 14.
195 Alta......6
340 Alpha......15⅞@16
400 Andes......1¼@@1.30
1780 Bullion......8@7⅞
300 Best & Belcher......19@19¼
385 Belcher......4.40@4.60
1135 Benton......3@2.85
30 Confidence......10⅞@10½
1575 Con Imperial......1.20
195 Crown Point......4.40@4.35
430 Chollar......7⅞@7½
970 Con Virginia......5⅞@5⅞
970 Con Dorado......2¼
870 California......5½@5⅞
210 Challenge......2.40@2.20
225 Caledonia......2.45@2½
840 Exchequer......5⅞@5⅞
400 Flowery......55c
690 Gould & Curry......11½@12
1750 Golden Gate......2½
580 H & Norcross......15½@15⅞
655 Julia......3.95@4
365 Justice......3¼@3.20
50 Kentuck......4.40
600 Leviathan......60c
95 L Bryan......75c
1146 Lady Wash......1.05@1
120 Mt View......2.60@2⅞
50 Mackey......1
1175 Mexican......43¾@42¾
335 New York......60@50c
15 North Con Vir......9½
1290 N Bonanza......1½@1.40
1145 Ophir......38@38½
210 Overman......9¼@9⅞
150 Occidental......2½
1580 Phil Sheridan......50@40c
1090 Potosi......6⅞@6
530 Silver Hill......2@1.90
485 Savage......14½@14⅞
1750 Sierra Nevada......84@86½
2950 Scorpion......5½@6⅞
170 Solid Silver......20@25c
200 Trojan......15c
630 Union Con......67@89½
550 Utah......26@27½
715 Ward......2⅞
50 Woodville......30c
200 Yellow Jacket......16⅞@17

AFTERNOON SESSION.
500 Addenda......40c
2800 Argenta......75c@1
1350 Albion......15@20c
2290 Belle Isle......4.45@4.35
170 Belmont......85@80c
1000 B Chief......65c
300 Boston......1.40
50 Booker......70c
260 Black Hawk......75c
200 Belvidere......75c
65 Bulwer......11⅞
1250 Bodie......13@12⅞
555 Bechtel......1.30@1¼
1100 Champion......20c
3100 Crœsus......20@5c
200 Caledonia (B H)......2½@2.30
370 C Pacific......7½@7¼
450 Dudley......95c@1
2890 Day......75@90c
200 Endowment......50c
565 Eureka Con......28@27½
180 Grand Prize......2@2.05
500 Golden Terra......12
100 Hillside......1⅞
450 Independence......1.60@1½
600 Leopard......50@55c
950 Metallic......80@75c
800 Martin White......1⅞@1.70
235 Mammoth......8@7⅞
115 Mono......6
400 McClinton......30c
260 Mt Diablo......7
30 Noonday......3@3.20
1245 N Noonday......3½@3.80
1200 N Belle Is......35c
800 Navajo......50c
165 Northern Belle......3⅞@3.65
700 Oriental......40c
425 Paradise......1.40
100 Queen Bee......15c
130 Richer......25c
250 Raymond & Ely......1.15
50 Real del Monte......2
50 S Bodie......20c
160 Syndicate......6
100 S Bulwer......35c
315 Summit......1.60@1.40
460 Star......50c
750 Tuscarora......40@45c
550 Tiptop......1.20
1100 Tioga......3¼@3.20
1250 University......25@30c
100 Wales......11½

Wed'sday A. M., Oct. 15.
1010 Andes......1½@1.30
50 Alta......5⅞
445 Alpha......16⅞@16½
505 Bullion......7⅞@7⅞
460 Belcher......4¼@4.35
100 Best & Belcher......19⅞
1130 Benton......3.10@3½
3750 Con Imperial......1.20@1.10
2200 Con Virginia......6⅞@6
100 C P Ravine......20c
100 Challenge......2¼
345 Caledonia......2½
740 California......6¼@5½
220 Chollar......7⅞
385 Crown Point......4.30@4.45
135 Confidence......10⅞@10½
395 Exchequer......5¼@6
350 Fairfax......80c
960 Flowery......65c
2960 Golden Gate......2½@3
640 Gould & Curry......11⅞@11⅞
300 Hale & Nor......15@15½
110 Justice......3¼
300 Julia......4.05@4
140 Kentuck......4¼
700 Lady Bryan......75@85c
300 Leviathan......60c
350 Lady Wash......1.10
245 Mexican......43@43½
205 Mackey......1
250 Mountain View......3@2.80
1710 N Bonanza......1½@1.60
695 New York......60@50c
135 Overman......10¼@10
980 Ophir......38@38½
310 Occidental......2.40@2½
100 Plutus......2½
1580 Phil Sheridan......55@60c
510 Potosi......6½@6
350 Silver Hill......1⅞@1.80
375 Savage......14¼@14
570 Solid Silver......30@25c
1495 Sierra Nevada......81@78½
1740 Scorpion......6@6⅞
1850 Trojan......15@20c
435 Utah......26@27
1590 Union Con......88@85
100 Wells-Fargo......10c
180 Ward......2.80@2.85
100 Woodville......40c
325 Yellow Jacket......16⅞@16½

AFTERNOON SESSION.
795 Argenta......90@80c
450 Albion......15@20c
75 Aurora......10c
50 Booker......75c
350 Boston......1.40@1.30
685 Bechtel......1.40@1½
1130 Belmont......60c@1.10
1070 Belle Isle......4.10@4.05
80 Belvidere......50c
620 Bodie......12⅞
25 Bulwer......11½
50 Black Hawk......80c
1700 Champion......20c
400 Crœsus......20@15c
175 C Pacific......7⅞@7¼
2026 Day......90@70c
125 Dudley......1@1.05
10 Eureka Con......28⅞
50 Endowment......50c
570 Gila......25@30c
150 Grand Prize......2.20
50 Goodshaw......30c
50 Hussey......15c
450 Hillside......1⅞@1.90
40 Independence......1.55@1½
300 Jupiter......75c
220 Jackson......4
150 Manhattan......2⅞
400 Metallic......75c
50 Mt Diablo......7
200 Modoc......90c
300 Mono......6½@6
455 Martin White......1⅞@1.70
260 Mammoth......8@7⅞
610 Northern Belle......3.90@4
625 Navajo......40@50c
350 N Belle Is......35@30c
1670 N Noonday......4@3.90
800 Noonday......3⅞@3.90
1100 Oriental......35@40c
150 Orient......15c
650 Paradise......1½@1
830 Raymond & E......1.20
100 Real del Monte......2
650 Star......60@50c
20 Summit......1.30
100 S Bodie......20c
100 South Standard......20c
250 S Bulwer......25c
1130 Syndicate......6@6½
1000 Tuscarora......35c
340 Tioga Con......3½@3.05
595 Tiptop......1¼
1000 University......25@30c
80 Wales......10½

SALES OF LAST WEEK AND THIS COMPARED

Thursd'y A. M., Oct. 9.
100 Alpha......17
190 Alta......5
440 Andes......1.10@1.05
300 B & Belcher......17½@17⅞
2060 Bullion......9¼@9½
255 Belcher......3.70@3.80
245 Benton......2.85@2.90
365 California......5¼
500 Con Virginia......5⅞@5¼
280 Crown Point......4.10
15 Chollar......7
400 Con Imperial......1.20
130 Caledonia......2.30
20 Challenge......2.10
250 Dardanelles......40c
325 Exchequer......5⅞@5⅝
50 Flowery......65c
200 Gould & Curry......10
410 Golden Gate......4½@2½
365 Hale & Nor......12½@12⅞
60 Justice......3.20
140 Julia......3.90@3.80
100 Kentuck......4.05@4
85 Lady Bryan......85@80c
1000 Lady Wash......90@85c
100 Leviathan......50c
135 Mexican......31½@31⅞
30 Mackey......1
150 Mt View......2½@2.60
450 N Bonanza......1.45@1.35
50 New York......45c
335 Ophir......33⅞@34
20 Overman......9
115 Occidental......2.30
375 Potosi......5⅞@6
180 Plutus......2.30@2¼
100 St Louis......30c
190 Savage......12⅞
325 Sierra Nevada......48⅞
365 Silver Hill......1¼
340 Scorpion......3.40
675 Trojan......20c
370 Union......67½@67⅞
335 Ward......2.65@2.80
220 Yellow Jacket......15⅞@15⅞

AFTERNOON SESSION.
100 Albion......15c
290 Addenda......40c
150 Argenta......75c
240 Belmont......75c
100 Booker......80c
70 Bulwer......11¼
325 Belle Isle......4½
150 Black Hawk......75c
600 Big Prize......35c
110 Bodie......12½@12⅞
40 Boston......1.35
200 Bechtel......1.10@1.15
500 Champion......25c
120 C Pacific......7⅞
300 Crœsus......20c
3350 Day......1.15@1.20
65 Eureka Con......26
230 Grand Prize......2@2.05
350 Goodshaw......30c
100 Hillside......1.80
100 Indepeudence......1⅞
290 Jupiter......1@95c
100 Leeds......50c
150 Mammoth......6¼
100 Manhattan......2⅞
150 Meadow Valley......5c
100 Metallic......80c
50 Mono......6½
100 Mt Diablo......6
100 N Belle Is......35c
1150 Navajo......65@55c
15 Northern Belle......3⅞
45 Noonday......2⅞
750 N Noonday......2½@2.60
500 Oriental......10c
200 Orient......35@30c
350 Queen Bee......20c
100 Richer......25c
230 Raymond & E......1.20@1¼
250 S Bodie......20c
20 S Bulwer......50c
150 Syndicate......4.30@4.90
300 Star......65c
10 Silver King......6
140 Summit......1.40
215 Tioga Con......2.70@2.60
425 Tiptop......1@1.15
300 University......25c

Thursday A. M., Oct. 16.
145 Alpha......17@16⅞
805 Alta......5⅞@6
425 Andes......1.20@1.30
770 Benton......3½@3¼
225 Best & Belcher......18
270 Belcher......4.20@4
455 Bullion......7⅞@7½
325 California......5⅞
288 Con Virginia......6½@6
450 Chollar......7@7¼
35 Crown Point......4.35@4.30
1695 Con Imperial......1.10@1.05
40 Confidence......10
560 Caledonia......2½
25 Challenge......2
1150 C Dorado......2.80@3¼
330 Exchequer......5½@5⅜
200 Fairfax......75c
290 Flowery......55@50c
345 Gould & Curry......10¼@10½
1430 Golden Gate......2⅞@2.65
185 Hale & Nor......14
450 Justice......3¼@3.20
80 Julia......4@4.10
70 Kentuck......4
360 Lady Wash......20c
310 L Bryan......80c
915 Mexican......38@38¼
100 Mackey......76c@1
230 Mt View......2⅞@2.90
895 New York......50@45c
495 N Bonanza......1½@1.55
325 Ophir......36¼@36½
220 Overman......9½@9
135 Occidental......2½
1255 Phil Sheridan......60@50c
310 Potosi......5⅞@6
200 Plutus......2.45
80 Scorpion......5¼
80 Savage......12⅞
345 Silver Hill......1.65
1850 Sierra Nevada......69@64
100 Senator......20c
375 Solid Silver......30c
200 Trojan......15c
355 Utah......23@25
1715 Union Con......77@82
350 Ward......2.80@2⅞
2600 Wells Fargo......20c
235 Yellow Jacket......15½

AFTERNOON SESSION.
350 Albion......15c
260 Adenda......45c
275 Argenta......80c
350 Boston......1.40@1.35
990 Belmont......1@1.05
100 Black Hawk......80c
50 Booker......75c
100 Belvidere......75c
30 Bulwer......11.65@11
610 Belle Isle......4¼@4.30
450 Big Prize......30c
195 Bodie......12⅞@12½
1770 Bechtel......1⅛
300 Champion......10c
100 Caledonia (B H)......2¼
100 C Pacific......7½@7¼
120 Dudley......1
670 Day......75@70c
235 Eureka Con......26¼@26¼
75 Endowment......50c
260 Grand Prize......2.40@2½
200 Goodshaw......35c
350 Gila......25c
100 Hillside......1.80
515 Independence......1⅞@1.70
530 Jupiter......75@60c
240 Leopard......55c
40 Leeds......50c
1000 Martin White......1.65@1½
50 Meadow Valley......30c
200 Metallic......75c
110 Mono......6¼
100 Mt Diablo......7@7¼
135 Mammoth......7¼
1800 N Noonday......4@3⅞
1450 N Belle Is......30c
345 Noonday......3.96@3.70
90 Northern Belle......4¼
250 Navajo......45@40c
2300 Oriental......40@50c
1750 Paradise......1½
50 Queen Bee......15c
170 Raymond & Ely......1.15@1¼
50 Star......50@60c
550 S Bulwer......35@40c
310 Syndicate......6¼
160 Summit......1.30@1.40
670 Tioga Con......3.15@3.30
200 Tuscarora......45@40c
790 Tiptop......1¼
100 Vortex......25c

Pacific Board—Latest Sales.

Wed'sday A.M., Oct. 15.
30 Alpha......16⅞
160 Alta......5⅞
200 Andes......1.30
60 Belcher......4.40@4.30
70 Benton......3⅞@3¼
30 Best & Belcher......19⅞
300 Bullion......7⅞@7⅞
180 California......6¼@5⅞
100 Chollar......7⅞
150 Con Imperial......1.20@1¼
310 Con Virginia......6⅞@6⅞
100 Crown Point......4.40
500 Colorado......3.30
20 Eureka Con......28¼
50 Exchequer......5.90
100 Ward......2.80
60 Yellow Jacket......16½

AFTERNOON SESSION.
50 Andes......1¼
60 Alta......5⅞@6¼
10 Alpha......16¼
180 Benton......3.80@3⅞
140 Bullion......7⅞@7¼
20 Best & Belchor......18¼@19
70 Con Virginia......6@6¼
30 Chollar......7⅞
150 Caledonia......2½@2.40
150 Con Imperial......1.10
70 Crown Point......4.35@4¼
50 Flowery......60c
100 Gould & Curry......11¼@11
70 Hale & Nor......14¼@16

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Argonaut M & M Co	California	2	10	Oct 7	Nov 15	Dec 8	J L Fields	240 Montgomery st
Bechtel Con M Co	California	3	15	Oct 1	Nov 6	Nov 25	W H Lent	309 Montgomery st
Benton Con M Co	Nevada	2	50	Sept 17	Oct 22	Nov 10	W H Watson	302 Montgomery st
Best & Belcher M Go	Nevada	15	1 00	Aug 29	Oct 2	Oct 22	Wm Willis	309 Montgomery st
Champion M Co	California	4	20	Oct 15	Nov 20	Dec 9	Jno Crockett	203 Bush st
Chollar M Co	Nevada	1	50	Aug 29	Oct 3	Oct 24	W E Dean	203 Bush st
Crown Point G & S M Co	Nevada	38	1 00	Aug 27	Oct 1	Oct 22	James Newlands	203 Bush st
Concordia M Co	California	2	15	Aug 20	Sept 26	Oct 21	A W Fox	310 Pine st
Gila S M Co	Nevada	5	25	Sept 30	Nov 3	Nov 24	W W Parrish	328 Montgomery st
Grand Prize M Co	Nevada	2	50	Sept 17	Oct 21	Nov 11	J E Dixon	20 S F Stock Ex
Hale & Norcross S M Co	Nevada	62	1 00	Sept 9	Oct 14	Nov 4	J F Lightner	58 Nevada Block
Hussey Con G & S M Co	Nevada	9	15	Aug 25	Sept 30	Oct 21	Jno E Dixon	20 S. F. Stock Ex.
Jupiter M Co	California	5	30	Sept 18	Oct 21	Nov 10	E C Masten	22 Nevada Block
K K Con M Co	Nevada	9	2 00	Oct 3	Nov 5	Dec 3	B B Minor	309 Montgomery st
Mexican G & S M Co	Nevada	8	1 50	Sept 11	Oct 15	Nov 6	G L McCoy	203 Bush st
Mono G M Co	California	5	1 00	Sept 4	Oct 9	Oct 29	W H Lent	309 Montgomery st
Murchie G & S M Co	California	2	25	Oct 9	Nov 8	Dec 8	S D Rogers	328 Montgomery st
Occidental Con G M Co	California	2	03	Aug 11	Sept 29	Oct 20	W T Smith	402 Montgomery st
Potosi M Co	Nevada	1	50	Aug 29	Oct 7	Oct 28	W E Dean	203 Bush st
Real Del Monte M Co	Nevada	8	1 00	Sept 18	Oct 20	Nov 29	C V Hubbard	203 Bush st
Rough & Ready Con G M Co	California	1	05	Oct 15	Nov 19	Dec 9	W H Lent	309 Montgomery st
Savage M Co	Nevada	39	1 00	Sept 22	Oct 31	Nov 20	E B Holmes	309 Montgomery st
Sierra Nevada S M Co	Nevada	69	2 00	Aug 30	Oct 3	Oct 22	W W Stetson	309 Montgomery st
Solid Silver G & S M Co	Nevada	2	25	Oct 6	Nov 10	Dec 8	J J Applegate	320 Sansome st
South Standard M Co	California	5	15	Sept 11	Oct 15	Nov 3	C A Saukey	331 Montgomery st
Succor M & M Co	Nevada	24	25	Aug 30	Oct 13	Nov 3	Wm H Watson	302 Montgomery st
Tioga Con M Co	California	7	30	Sept 10	Oct 15	Nov 4	W H Lent	62 Nevada Block

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Hydraulic Grav M Co	California	1	20	Oct 2	Nov 10	Dec 13	James Ireland	216 Sansome st
Butte Creek Hyd M Co	California	3	15	Sept 18	Oct 20	Nov 5	R L Taylor	310 Pine st
Sutte Hydraulic M Co	California	—	10 00	Aug 25	Sept 29	Oct 21	L L Dennery	328 Montgomery st
Dardanelles M Co	Nevada	7	50	Sept 9	Oct 10	Oct 27	H C Hinman	411 California st
De Haro M Co	Nevada	2	10	Sept 24	Oct 27	Nov 12	W W Bausman	409 California st
Double Standard G M Co	California	1	10	Sept 13	Oct 21	Nov 11	W H Lent	309 Montgomery st
Diana G & S M Co	Nevada	4	10	Sept 24	Oct 23	Nov 15	J T McGeoghan	318 Pine st
Equitable Tunnel & M Co	Utah	21	10	Sept 16	Oct 21	Nov 14	C J Collins	227 Montgomery st
Geo Douglas M Co	Nevada	3	10	Sept 24	Oct 27	Nov 13	W W Bausman	409 California st
Hamburg M Co	Nevada	1	1 00	Sept 19	Oct 21	Nov 10	D A Jenning	401 California st
Joe Scates Con S M Co	Nevada	4	10	Sept 24	Oct 27	Nov 13	W W Bausman	409 California st
J & K G M Co	California	1	15	Sept 29	Nov 3	Nov 24	W H Lent	309 Montgomery st
Mammoth Grove M Co	California	1	02	Oct 9	Nov 13	Nov 29	A B Paul	328 Montgomery st
Maybelle Con M Co	California	3	10	Sept 6	Oct 15	Nov 10	A W Fox	310 Pine st
Mayflower G M Go	California	6	10	Oct 9	Nov 12	Dec 9	J Morizio	328 Montgomery st
McClinton M Co	California	4	25	Oct 10	Nov 14	Dec 4	W H Lent	309 Montgomery st
Meadow Valley M Co	Nevada	15	25	Sept 12	Oct 22	Nov 17	T W Colburn	414 California st
Mono and Cross Con M Co	California	1	10	Oct 8	Nov 12	Nov 29	J M Buffington	309 California st
Monte Cristo Con M Co	California	1	10	Oct 3	Nov 17	Dec 15	Butler Burris	309 Montgomery st
Mt Hood M Co	Nevada	3	10	Sept 24	Oct 27	Nov 13	W W Bausman	409 California st
Nob Hill G & S M Co	California	1	15	Oct 6	Nov 10	Nov 28	J H Sayre	330 Pine st
North Scorpion M Co	Nevada	1	10	Aug 11	Nov 3	Nov 20	T B Ludlum	211 Sansome st
Orion M Co	California	5	30	Oct 9	Nov 10	Nov 25	P Conklin	28 Sansome st
Quartz Mountain G M Co	California	7	60	Sept 20	Oct 27	Nov 17	E Hestres	729 Montgomery st
Sabine M Co	Nevada	2	10	Sept 24	Oct 27	Nov 12	W W Bausman	409 California st
Santa Mina G M Co	California	1	15	Aug 29	Oct 2	Oct 22	J H Sayre	330 Pine st
San Xavier M & S Co	Arizona	1	25	Oct 14	Nov 17	Dec 8	F A McGee	32 Merchants' Ex
Sherwood Con M Co	Nevada	2	10	Sept 1	Oct 6	Oct 23	H S Stone	309 California st
South Utah M Co	Nevada	3	10	Sept 5	Oct 6	Oct 25	C S Healy	45 Merchants Ex
South Comstock G & S M Co	Nevada	6	25	Sept 9	Oct 13	Nov 3	J M Buffington	309 California st
Tolo M Co	Nevada	2	10	Sept 24	Oct 27	Nov 12	W W Bausman	409 California st
Vancouver M Co	Nevada	3	10	Sept 24	Oct 27	Nov 13	W W Bausman	409 California st
Wide Awake P & M Co	Arizona	8	03	Oct 11	Nov 11	Dec 11	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Belvidere M Co	Nevada	O V Hubbard	203 Bush st	Annual	Oct 21
Commonwealth Con M Co	——	O A Morse	217 Sansome st	Annual	Oct 22
Con Dorado M Co	California	J McDougall	309 California st	Annual	Oct 28
DeFrees M & M Co	California	T Ealkinson	318 Pine st	Annual	Oct 20
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	Annual	Oct 20
Gila S M Co	Arizona	W W Parrish	328 Montgomery st	Special	Oct 21
North Noonday	California	A W Fox	310 Pine st	Annual	Nov 4
Occidental Con G M Co	California	W T Smith	402 Montgomery st	Annual	Nov 1
Shawmut G Q M Co	California	J S Bacon	316 California st	Annual	Oct 23
True Blue Con M Co	——	H R Miller	405 California st	Annual	Oct 20

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Belle Isle M Go	Nevada	John E Dixon	Stock Exchange	75	Oct 6
Bodie Con M Co	California	W H Lent	Nevada Block	50	Oct 1
California M Co	Nevada	C P Gordon	'23 Nevada Block	50	Aug 17
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	50	Aug 16
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	2 00	Oct 20
Independence M Co	Nevada	John E Dixon	Stock Exchange	25	Aug 21
Indian Queen M & M Co	———	A K Durbrow	69 Nevada Block	20	Aug 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	July 26
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	30	July 28
Montezuma M & M Co	———	J T McGeoghegan	318 Pine st	25	Aug 12
Pioneer M Co	California	J W Pew	310 Pine st	08	October 6
Standard Con M Co	California	Wm Willis	309 Montgomery st	60	Oct 13

60 Gould & Curry	11¼	190 Julia	4
120 Hale & Nor	15¾@15	175 Justice	3.30@3
170 Julia	4.10@4½	100 Lady Wash	1
50 Justice	3.55	50 Mackey	1
100 Lady Wash	1.20	200 Mexican	41¼@39
85 Mexican	43¾@42	150 New York	.60c
95 Ophir	38¼@38½	150 N Bonanza	1.60@1.55
5 Overman	10	170 Ophir	37¼@36¾
50 Occidental	2½	20 Overman	10¼@10
350 Phil Sheridan	50c@45c	50 Potosi	6
60 Potosi	6½@6	145 Sierra Nevada	77¼@71½
100 Savage	14¼@14	100 Silver Hill	1.85
95 S Nevada	85½@78	100 Savage	13½
113 Scorpion	6.30	50 Scorpion	8½
585 Silver Hill	1.90@1½	20 Union	89¼@87
90 Union	92½@88	70 Uncle Sam	2½@2.20
110 Utah	26@25½	50 Ward	2.80

California Board—Latest Sales.

Wed'sday A.M., Oct. 15.		AFTERNOON SESSION.	
20 Alpha	16¼@16½	30 Alpha	16½
70 Alta	6½@6	40 Alta	6
50 Atlas	23c@25c	400 Atlas	24c@22c
100 Atlantic	9c	900 Atlantic	6c@5c
300 Andes	1.35@1.20	300 Atlanta	5c
40 Belcher	4.45c@4½	300 Almaden Q	75c@70c
40 Best & Belcher	19½@19½	20 Best & Belcher	19½
120 Bullion	7½@7½	30 Belcher	4.35
200 Brilliant	5c	50 Bullion	7½@7½
40 California	6½	500 Black Hawk	55c@62½c
175 Con Virginia	6½@6½	60 Con Virginia	6c@6½
200 Con Imperial	1½	30 California	6
40 Crown Point	4.40	100 Con Imperial	1.15
40 Chollar	7½@7½	40 Crown Point	4.30
30 Challenge	2.30	30 Chollar	7½
100 Caledonia	2½	500 Coso Con	5c
110 Exchequer	5½@5.70	30 Challenge	2.30
20 Gould & Curry	11½	20 Caledonia	2.40
30 Hale & Nor	15½@15½	80 Exchequer	5½@5½
30 Julia	4.10	100 Enterprise	1½
40 Justice	3.20@3½	40 Gould & Curry	11½@11½
50 Mexican	43@43½	100 Golden Chariot	6c
100 Mint	10c	100 Glynn Dalo	8c
100 N Scorpion	.5c	150 Gipsy Q	50c
330 N Sierra Nevada	15c@14c	40 Hale & Nor	15½
500 North Carson	1c	30 Julia	4.05
30 Ophir	38c@38½	30 Mexican	41
40 Potosi	6	300 Newark	12c@10c
40 Savage	14½@14½	50 Ophir	37½@37
40 Sierra Nevada	83c@83½	300 Senator	20c
100 Senator	20c	50 Savage	14½@14½
300 Silver Hill	1.85@1.95	30 Sierra Nevada	76½
100 Trojan	16c	20 Union Con	86
20 Union Con	93c@93½	200 Wells-Fargo	12c@15c
200 Wells-Fargo	11c	30 Yellow Jacket	16½@16½
20 Yellow Jacket	16½		

Mining Share Market.

At the close of onr last report (Oct. 9th) the market presented a dismal and discouraging aspect. The new week, however, began with reported improvements in the Union shaft, and removed some of the despondency, so far as favorite Comstocks were concerned. Rumors of rich strikes in the Sierra Nevada sent up that stock and Union Con., with a few others, but the feeling that perhaps the rumors were untrue sent them all back again to a slight raise over last week; and although the rumors have been changed into confirmatory reports of rich ore, averaging $425 assay, and plenty of it, did not create the anticipated boom. The fears that have been raised from time to time by unauthenticated rumors heretofore cannot be allayed in a few days, even if the rich discovery of ore in the Sierra Nevada should prove a continuous reality. The public seem to be afflicted with the fear that porphyry is yet to put in an appearance, although a late dispatch says that there never was a better showing on the lode at the same stage of development. The main portion of the market, including the "hooming" stocks, has declined, apparently, to its normal condition. The trouble is laid at the door of the bears, although it would seem that assays of ore all the way from $425 to $1,394.40 would be able to at least steady the stock representing the mines turning out such rich ore, and avoid such breaks as have occurred for several days.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Tiger, Oct. 10th, $26,000; Northern Belle, Oct. 6th, $4,380.67; Martin White, Oct. 8th, $4,703.15; Northern Belle, Oct. 8th, $4,690.64; Christy, Oct. 13th, $5,374; Alexander, Oct. 11th, $7,713.53; Martin White, Oct. 12th, $5,742.90; Oriental Con., Oct. 16th, $2,323.54.

Freak of Nature.—A singular freak of nature is shown in a marble mantel at the Cincinnati exhibition. In one of the onyx pilasters are seen the outlines of a woman's form, produced ages ago, when the marble first assumed its growth and consistence. Its discovery was the result of an accident. One of the workmen turned the pilaster upside down, and the strange beauty of the features of the face at once attracted his attention. His employers were summoned, and the pilaster reversed is now the chief ornament of the mantel.

Gold in Coos County, Oregon.—A remarkable discovery of gold is said to have been made outside the Coos Bay bar. The United States surveyors, while sounding on Sept. 25th, dropped their lead into 48 feet of water, bringing it up again covered with gold. There are good gold diggings on the beach opposite where this discovery was made. A dispatch from Empire City to the Roseburg *Independent* conveys this intelligence. It says: "There is no doubt as to the richness of the gold deposit discovered; it remains only to find a way to reach it."

In San Francisco half dollars are quoted at 99½ buying, 100 selling; trade dollars, 95 buying, 96½ selling; Mexican dollars, 91 buying, 92 selling.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

Volcano Items.—*Ledger*, Oct. 11: An engine has been brought up from Sutter Creek to run the drills in the big tunnel. The face of the tunnel is in the hardest description of rock, but it is likely that softer material will be encountered ere long, through which rapid headway can be made. Several miners lately engaged on the Sutro tunnel are employed on this undertaking. At the claim of Robinson & Jones there are 200 tons of first-class ore out, which is to be crushed at Robinson's mill at Russell's, two and a half miles from Volcano. This mill has been leased for the purpose of crushing the rock from this mine, the mill owner agreeing to put it in good order, and receive $1 per ton for its use. Teamsters now hauling ore from the mine to the mill at $1.25 per ton. Two teams are kept going hauling ore from the Downs mine to the mill. R. Stewart is opening his quartz claim. He has a two-ft ledge of paying grade. A whim is in course of erection, and also a chute to convey the rock to the road. The Golden Gate and Confidence mines are yielding rock of paying character. Mr. Fryc is prospecting a claim near Robinson & Jones', and has struck gold-bearing quartz. Bids have been sent in for building a 40-stamp mill for the Coney mine. The specifications call for the best class of work, and require the mill to be completed in 45 days.

BUTTE.

Banner Mine.—*Mercury*, Oct. 10: A 15-stamp quartz mill and 40-horse-power engine have been received at the Banner mine, from San Francisco, during the past week, and are now being put up. The machinery will be located in the old mill building and the ore brought to it over a tramway. It is expected that crushing will be commenced in about two weeks.

CALAVERAS.

Items.—The *Chronicle* in a late issue says: We have returns from a small lot of quartz taken from the Tom Paine mine at West Point, owned by Reed & Co., that beat anything we have heard of lately, barring the great Sonora discovery. Six tons of ore yielded 82½ ounces of gold! Reduced to dollars and cents, that is in the neighborhood of $275 per ton.

Tiger.—Work has been resumed at this mine, which is located in Rich Gulch flat. The shaft is to be sunk another 100 ft or so.

Gwin Mine.—*Chronicle*: This mine is thoroughly developed to the depth of 1,500 ft. A new shaft is being sunk and other improvements made to increase the producing capacity of the mine.

INYO.

Monock.—*Independent*, Oct. 11: Official letter of Mr. Tibbets says: In south drift, 300 level, we are getting softer ground than for some time back; have but a short distance to run to reach ground started for. North drift, from No. 2 crosscut, 300 level, is going ahead well, keeping the ore on west side of drift. On account of air at this point it may be necessary to run a connection drift from crosscut No. 1 to No. 2, and in that event shall probably run through ore. This place continues to present some favorable showing as before mentioned. Crosscuts at 800 and 1000 levels are looking finely, and are in ore. Ground in under drain has been hard this week, making rate of progress lighter than usual.

KERN.

New Ledge.—The Bakersfield *Gazette* of last week says: A mining discovery has been made about 15 miles above Kernville, near Kern river, west side, that promises to be valuable. Near the summit of the mountain at this point there has at some time been a landslide that exposed a quartz ledge. This was discovered in June last, and located by Milton Kennedy and W. B. Rose. They had an assay made of surface rock by P. Y. Baker, of Visalia, U. S. mineral assayer and surveyor, which yielded at the rate of $24.11 per ton. The locators went down the hill below the surface croppings and started a tunnel to strike the ledge, and did strike it 90 ft from the mouth of the tunnel. They have every reason to believe that the ledge is very wide—over 20 ft—but as yet have only penetrated into it to a distance of 5 ft. The outside casing, which is an inch and a half thick, is thickly studded with fine gold; but none can be seen in the rock, which is full of sulphurets. They had an assay made of rock taken from the ledge at this point by Mr. Baker, and it yielded at the rate of $1,120 to the ton. The new mine is named "Young Guide," and is easy of access, with abundance of wood and water in the vicinity.

LAKE.

Great Western Q. M. Co.—Lake *Bulletin*, Oct. 12: The Great Western Quicksilver mining company, near Middletown, are building a fine ore furnace of larger capacity. The mine is in splendid condition, producing six and seven hundred flasks per month. We understand that sufficient ore is in sight to run the mine for three years without further prospecting.

MODOC.

Item.—The *Independent* says: Cedarville is just at this time excited over the discovery of a gold-bearing quartz ledge about eighty miles east of that place, near Summit lake. A great deal of "pocket mining" has been done in that vicinity, and a large quantity of gold has been taken out. A short time since a prospecting party was fitted out at Cedarville for the purpose of prospecting for a ledge, which was discovered as above stated. The ledge is said to be 50 ft wide and about 1,500 ft in length.

MONO.

Mammoth.—*Herald*: A rich development of gold-bearing rock has lately been discovered in this mine. From what we learn, the last developments made were in the winze sunk from what is called the Bonanza tunnel, at a depth of 100 ft. The middle tunnel, which is now being run for the purpose of working the mine at a depth of 200 ft in this winze, and the work is being prosecuted with great vigor by the use of Ingersoll drills and compressed air. At the headway which is now being made, this rich body of ore will be struck within the next thirty days or less.

South Noonday.—Bodie *News*, Oct. 12: New shaft has reached a depth of 30 ft, and are now engaged in timbering two compartments, 4x4 ft each, with timbers 10x10 inches.

Dudley.—It is anticipated that the Dudley ledge will be cut in 25 or 30 ft from the present face in the crosscut, which is now in 40 ft on the 400 level.

Con. Pacific.—The main shaft has reached a depth of 382 ft. The 2-ft ledge found in the shaft week before last dipped to the east and out of the shaft early in the week, and day before yesterday another ledge about 6 in. wide bright lively quartz was cut. This latter vein dipped east at an angle of 50°, and has already gone east of the shaft.

Addenda.—West crosscut on 260 level now in 64 ft, showing a well defined ledge averaging 10 ft in width. At the 300-ft level, main drift south in 117 ft, still carrying the quartz formation. Crosscut west at the same level in 21 ft. At the 400-ft level the north drift is in 105 ft. Crosscut west, same level, is now in 32 ft. South drift from this level is now in 165 ft; crosscut east in 60 ft; crosscut west in 05 ft; ledge on this level looks remarkably well.

West Pacific.—The east vein struck shows free gold, and the character of the ore is the same as that found in the Con. Pacific, which lies adjoining the West Pacific on the east.

Triumph.—A shaft 80 ft deep has been sunk, showing favorable vein matter.

University.—Three compartment, well-timbered shaft completed 125 ft from surface. Iron stained porphyry at bottom, and seams of quartz and clay.

Maryland Con.—Stringers of quartz are coming in which assay at high figures.

South Bulwer.—Drifting on the ledge at 350-ft level. Ledge at the point named 3 ft wide, of fair milling ore. Engaged drifting north from winze No. 2, work showing ledge 5 ft in width of very good ore.

Bodie Bluff Con.—Incline down 75 ft on vein. Ore on hanging wall very rich.

Bodie Tunnel.—In 1,225 ft near Bechtel line.

B. C. & L. C. Joint Shaft.—In 110 ft, and well timbered. Ledge 2 ft wide, of good milling ore.

Noonday.—*Chronicle*, Oct. 11: The combination shaft is down 400 ft. The east drift is in 120 ft; north drift, 225 ft. The mine is looking well in every particular.

Blackhawk.—Rock is bottom of shaft has changed to vein formation.

Tioga.—Outside the loss of life, the damage at the works by late accident, amounted to a trifle.

Mono.—The east crosscut is in 505 ft east of the shaft. Have drifted north from this crosscut 110 ft, and the formation passed through shows that it is on top of the ledge, and some good ore has been taken out.

Red Cloud.—Five-ft ledge of fair ore in drift on 250 level. Upraise from same drift in 3-ft ledge better ore, although low grade.

Baltimore Mine.—*Lake Mining Review*, Oct. 11: The tunnel run by this company has tapped the vein at a depth of 100 ft, 36 ft from the mouth, and is now in the vein 8 ft, all gold milling quartz.

NEVADA.

New Strike.—*Herald*: John Grimes, who recently purchased the interest of Mr. Ragon in their mine in Mr. Grimes' field on Gold Flat, reports having struck rich rock. The ledge is about 20 inches thick.

Grissel Claim.—The claim of Grissel & Wing, located in the bed of the Yuba river, above Washington, keeps panning out well in coarse gold. Last Saturday they found another rich crevice and took out 60 ounces of fine nuggets. The next morning they took out 20 ounces more

Item.—The Kansas, New York and Live Yankee mines are being prepared for working machinery to be put in.

Rich Strike.—F. Byrne, Esq., brought a sample of rock to the *Herald* office to-day, which was taken from the old Corinth ledge, on Gold Flat, near the El Capitan mine. The rock showed very rich in free gold, which was to be seen in the form of threads, heads and leaves or scales. Some of the leaves were a quarter of an inch across and almost as thick as tin. These were found all scattered through the decomposed quartz, which came from the edge of the ledge as it was picked apart. The mine has been renamed the Gold Leaf. The rock carries some sulphurets, which are very rich. The vein is from a foot to 18 inches thick. The shaft is down nearly 50 ft. About two tons of rock have been taken out.

New Lead.—*Transcript*: Mr. Gillespie has made a remarkable strike in his shaft on the Cornish ledge, 300 ft north of the railroad track and 600 ft east of the Town Talk tunnel. The shaft has a depth of about 40 ft, and for some time past the ore from the north and south drifts has been paying from $15 to as high as $50 per ton. This week he commenced working in another portion of it, and on Wednesday developed a 12-inch body of quartz, through which runs a lead an inch thick of what is described as being "solid gold."

Washington Mining District.—*Tidings*, Oct. 11: The Yuba gold mining company have struck a ledge in the cross-cut recently started, but from the distance run, as compared with surveys made, it is not supposed to be the main ledge for which the drift is being run. The quartz is said to be fair looking. The company is getting things in shape for winter. The Last Chance mine is looking well. We saw a lot of rock from this mine this week, and it is as rich as Bodie's choicest, but it is so near home that little attention is paid to it. The ledge is 3 ft thick in the drift and is rich. The Bessie Miller company is driving the main tunnel and, it is said, finding good looking quartz. On Poorman's creek the new company for which McGlew is superintendent is reported to be finding very rich rock.

Murchie Mine.—*Transcript*, Oct. 14: Among the improvements that it is understood the management of the Murchie Quartz mining company desire to make soon, are the erection of a new 40-stamp mill and hoisting works. The latter would be put up 360 or 400 yards southwest of the one now in use, where it is believed an incline can be sunk so as to reach the ledge without first running the long drifts through solid rock that are, at present, found necessary. The hoisting works now standing are not in a good condition, therefore a double reason exists for putting up new ones. The old mill works well, but will probably be kept where it is in case the improvements named are made, as it is thought enough rock can be taken out in its vicinity to keep it going.

PLACER.

Promising Gravel Mine.—*Argus*: Robert Shannon has a promising gravel claim of 40 acres down on the American river, about a mile and a half from Auburn station. He has a tunnel running in about a hundred ft, from which gravel is taken that shows very many colors to the pan.

Good Ore.—The McLeod brothers and two other men, all residents of Penryn, recently struck what they believe to be a good paying claim near the old Stewart's Flat quartz mill, about a mile southeast of Penryn. Some of the rock was taken to a custom mill at Ophir and crushed. It yielded something like $27 or $28 per ton.

Rich Strike.—*Herald*, Oct. 11: Frank Hoffman, an old resident of Michigan Bluff, has recently made a gravel strike on what is known as Sage hill, about a mile from the Bluff, that is reported as very rich. He washed out a number of pans, after striking the gravel, for the purpose of prospecting it, and from one pan, the last one washed, he realized $23.50. This is a '49 lead, and has every indication of being extensive.

PLUMAS.

Greenville Mine.—*National*, Oct. 11: The Plumas National Co. is now working this mine through the No. 2, or lower tunnel, having opened up direct communication by a tramway. The ledge now being worked by the company, as developed by the lower tunnel, presents a beautiful and remarkably well-defined appearance, the walls being as regular and perfect as a fissure vein can show. The mine at this depth is being opened up very rapidly, and the quantity of ore shown in the various stopes is immense—the main stope exhibiting a body of ore over 10 ft wide. The sulphurets are being concentrated in the mill by the Hendee process, and it is reported that they assay very satisfactorily, and that the company will erect the necessary furnaces to roast and reduce them.

Green Mountain Mine.—A very fine quality of ore is being mined from what is termed the Grass ledge. This mine has a No. 3 or lower tunnel, some 1,800 ft in length, which, at about 1,200 ft, cut a large, fine body of quartz. This has developed into a big ledge, and is well opened by stopes. Work is pushed ahead in this tunnel, the intention being to strike the main ledge at this depth. From the No. 2 tunnel an incline shaft is down 50 ft on the ledge, and the main or lower tunnel is making for this point. The two mills of the company are running on full time.

Items.—The Mexican mining company, in North canyon, has a tunnel in about 800 ft. They have a good ledge, and have extracted some excellent ore. Their mill is running regularly, and their returns are reported satisfactory. The New York mill has been recently started again, after being moved to a point nearer the present workings of the mine. A company has been formed recently in Greenville to develop a large gravel claim across the ridge north, towards Mountain Meadows.

SIERRA.

New Ledge.—*Messenger*: The Tiger Quartz Ledge, located at Shakeville near the Pliocene shaft, at the head of Rock creek, is the last development in the quartz line in this section. Some time since, Henry Winters and others, knowing that considerable gold had been taken from the ledge in years gone by, determined to prospect further in the vicinity. Starting a shaft, they had only sunk about four ft from the surface when they struck a ledge six ft wide, the rock from which yields $3,750 per ton. Considerable work has been done here in the way of running tunnels just under the surface, but for some reason the claim was abandoned, and no labor has been performed for the past ten or fifteen years. The ridge on which the location is is full of quartz, and half a mile further east than Shakeville persons made large wages some years ago by sinking shafts and carting the dirt to Rock creek to be washed, the gold being in the loam, and but a few feet below the surface.

TULARE.

New Discoveries.—*Delta*: We hear of a promising silver lead discovered by William Toomey, on the county line of Tulare and Fresno, near Mill creek, on the ranch of Martin Parsons, and 50 rods from his house. Toomey and Parsons have located 1,500 ft each. The lead just below the surface is three ft wide. Assay of croppings, $50. Discoveries of rich ore-bearing rock are reported about 45 miles from Visalia, north of King's river, in the foothills. Assays range from $25 to $500 per ton, gold and silver. Several claims are already located, and on one work is being vigorously pushed.

NEVADA.

WASHOE DISTRICT.

Ophir.—Gold Hill *News*, Oct. 16: The crosscut west on the 2400 level is now making better progress, averaging three ft per day, and passing through favorable-looking vein material carrying stringers of quartz; total length from the east side of the incline, 50 ft. The east crosscut on the 2300 level has reached a soft vein formation which requires to be timbered as penetrated, reducing progress to two and a half ft per day; total length 110 ft. This formation also carries stringers of good-looking quartz together with clay. The connection between the joint workings from the 2100 and 2300 levels is being enlarged to the full size of the winze and timbered. The drift following the Hardy vein on the 2100 level is making two ft per day through good ore; total length from crosscut No. 1, 110 ft. Four ft per day are being added to the length of the joint Mexican crosscut west on the 2000 level, the face being in bluish-eye porphyry carrying streaks of quartz; total length, 240 ft.

Sierra Nevada.—The drift south and west from the 2300 station of the incline has been timbered up, and is going ahead again slowly, the formation penetrated needing to be timbered as opened up. This drift has run 25 ft into very rich ore. The ore body is crossed by stringers of ore still richer, and the face shows no falling off in the quality. The drift is being run for the Union shaft with which it will connect, and is following the course taken by the diamond drill run some two months ago. The drift east from the east shaft, 2200 level, is now in 136 ft, the face in hard, blasting porphyry.

Con. Virginia.—The south lateral drift, 850 level, and running from the joint crosscut, is now 100 ft in length, the face in a vein formation of clay and quartz and looking well.

Mexican.—The joint Union crosscut west on the 2000 level is again in soft vein matter, having cut through the rib of hard porphyry recently encountered; total length, 105 ft. The joint winze from this level is now down 130 ft, and continues in soft vein matter carrying considerable water.

Union Shaft.—The shaft has attained a depth of 70 ft below the 2200 level of the Sierra Nevada—2300 of the Union—the bottom continuing still in ore and improving as depth is gained.

Gould & Curry.—The joint east crosscut on the 1700 level is in 1412 ft from the main lateral drift, the face in porphyry. This drift is some 300 ft east of the Bonner shaft. The whole distance from this shaft to the new joint shaft is 2,285 ft.

California.—The stopes in the ore vein, 2150 level, have been carried up 35 ft, the upper floor still in good ore. The north drift on this level has followed the ore vein 55 ft, and it still holds its width of four ft of good milling ore in that direction. The lateral drift from the joint crosscut, 850 level, is being carried north; total length, 63 ft, the face in the vein matter consisting of clay and quartz, and looking well.

Consolidated Imperial.—The joint Alpha crosscut east, 2600 level, is being driven rapidly forward through good-looking vein matter; total length, 125 ft.

Lady Bryan.—The south drift, same level, is now in fine-looking quartz, assaying from $6 to $7. The drift west from the drift south, 600 level, has been discontinued.

Scorpion.—The shaft is down 200 ft to-day, and has passed through the reddish quartzite of the surface, which pitched to the west, and is now in a promising formation of clay and quartz, and porphyry dipping to the east, the quartz giving low assays.

Andes.—Drifting east on the 350 level, and encountering some places of ore. The drift along the ledge from the bottom of the winze and 60 ft below the 400 level, is in a formation of quartz and porphyry mixed.

Wash.—The shaft has reached the depth of 1,750 ft, the bottom being in hard rock. The flow of water is still heavy. The east crosscut, 800 level, is 920 ft, and without any marked change.

DUN GLEN DISTRICT.

Royal Eagle.—*Silver State*, Oct. 14: This is a newly discovered gold-bearing quartz ledge at Dun Glen. It crops out 10 or 12 ft high on the mountain, but as it was exceedingly large and covered with moss none of the hundreds of prospectors who passed by it since the district was organized ever suspected that the bluff was quartz, and literally spangled with gold. When Thomas left Dun Glen the discoverers had drifted over 20 ft into the bluff at right angles with the course of the ledge, and were taking out quartz that will average at least $100 to the ton. The specimens which he brought here were broken from a boulder which a blast had thrown down the hill, and free gold is visible to the naked eye all over them. He says there are thousands of tons of quartz in sight, in all of which free gold is visible.

EUREKA DISTRICT.

Silver Connor.—The *Sentinel* says: Four men are employed in this mine, and the mouthly yield aggregates about $2,000. The ore runs from $80 to $350 per ton, chiefly in gold. There is an immense mass of lower grade ore in the mine, which cannot be handled profitably at the present time for transportation and reduction. The Silver Connor is one of the best paying mines in the district.

Hoosac.—Mr. Lesser informs us that the late development in the Hoosac mine is still improving, and bids fair to widen into a bonanza of good size. The ore is of high grade and carries less base material than the ore obtained in the old workings of the mine. The Hoosac boys are feeling much encouraged over the prospects of their prosperity.

JACK RABBIT DISTRICT.

Day Mine.—A. S. Gould, Sup't, in his official report of Oct. 10 in the Pioche *Record*, says: Our work of squaring out will be finished to-morrow, and as I have now most of necessary timbers on the ground I shall be ready, I hope, to commence sinking on Monday or Tuesday next. We will go down directly through the ore body. Owing to the fact that we need better ventilation I have concluded to make a connection from the black winze to our present working, which can be done in probably a week. Our prospects and showing are still of the most encouraging character. I am firm in the belief—firmer than at any time before—that we have an exceedingly valuable mine, but the company must be a little patient till I get things in shape so as to work advantageously. We are not breaking ore at present for the reason that our ore house and platforms are full.

PATTERSON DISTRICT.

Renewal of Work.—Pioche *Record*, Oct. 11: We learn that mining operations will shortly be renewed in this old abandoned mining district, which some years ago attracted considerable attention, but was finally abandoned and all the buildings of the town were torn down and hauled to this place. For the past four years the ranchers in that neighborhood have been devoting their spare time to prospecting in Patterson district, and have discovered and opened up some very promising ledges, and through the aid of an agent have succeeded in getting parties in

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Carbonate Belt of Colorado.

Frank Fossett, in his interesting book entitled "Colorado, Its Gold and Silver Mines," etc., after giving a history of the rise and growth of Leadville, describes the formation and characteristics of the carbonate belt in that region. He says:

The Arkansas river flows in a southerly direction for some distance from its sources among the lofty Sierras. The valley that encloses it is bordered by the great Continental Divide on the west, whose peaks for 100 miles average over 14,000 feet high, and the almost equally elevated Mosquito or Park range on the east. Both of these mountain systems unite near Mt. Lincoln and the head of the easterly fork of the Arkansas. Below the bald and barren crest of the Mosquito range are what might be termed its foothills, sloping west to the Arkansas valley. Among these heavily-timbered hills is the famous carbonate belt, and through it California, Stray Horse, Evans and Iowa gulches lead westward down to the main stream. The Mosquito or Park range separates the Arkansas valley from that great natural basin of the "Rockies" called South Park. Leadville is on an inclined plane, sloping west and at the base of the carbonate hills, 10,025 or 10,200 feet above the sea.

The course of the carbonate zone or belt is north and south, and the general dip of the ore is eastward and from 12° to 25° downward from the horizontal; but there are numerous faults and displacements, as with the overlying porphyritic trachyte and underlying limestone. Above the porphyry may be more or less "drift," and below is the limestone formation, quartzites, crystalline schists and granite, tilting downward one below the other, but occasionally pushed out of place.

The direction of the ore deposits is often changed from the ordinary incline to the vertical, or to wave-like depressions and elevations corresponding to those of the limestone. The depressions contain most of the richer ore when it is in ordinary or thin layers. The underground workings are often like so many irregular steps and landings, making the construction of a regular incline finally necessary for large production and advantageous operations in the mines. The limestone forms the footwall, on which the contact deposits have been made, and the porphyry the hanging wall. In places the porphyry is found under and beside the ore for short distances.

The veins or deposits so far opened have varied in thickness from the thinnest kind of a seam to several feet. There are claims that show 10 feet of mineral, and a few have ore bodies 20 and 30 feet thick. The quantity of the valuable metals contained varies greatly, and, unlike most other districts, the largest deposits are as likely to be among the richest as any other way. Most of the ore is so soft as to require no blasting—the pick and shovel being sufficient to remove it.

It has been said that Leadville district defies all previously developed rules regarding mineral in place or in deposit. Mineral is found by sinking shafts, and not by the outcrop, as in mineral veins elsewhere. The objective point is the contact of the porphyry and limestone, for between those formations the mineral is almost universally encountered, if found at all. Below the porphyry is the iron, which is a sort of cap rock to the ore, and is called the contact. Below this, if no ore is found, and otherwise beneath the ore, usually occurs the blue limestone, in undulations like a disturbed sea. If no ore is visible at such locations, the miner drifts on the contact to the right or left, or in any direction, with the hope of finding less barren localities beyond. Rich ore bodies have been found by drifting when none were manifest at the bottoms of shafts.

It will be seen that this prospecting for ore by "sinking" is attended with a great deal of uncertainty, and this uncertainty not only pertains to the ultimate results, but also to the depth necessary to go before anything definite can be ascertained. In some places the contact has been found at depths of 30 or 40 feet, and in others it was more than 200 feet below the surface. It is generally conceded that four distinct stratifications, veins or mineral layers, have been developed in the Leadville carbonate district; that these stratifications extend in a northerly and southerly direction, and dip eastward into the mountains at an angle of from 15° to 25° below the horizontal.

The ore yields from a few ounces of silver per ton in some localities to 50, 100 or 200 in another. Bunches of $1,000 and $2,000 ore have been found, but they are not extensive. The proportion of lead is almost as variable, ranging all the way from a few per cent. up to 70%. Ore rich in silver is more likely to be rich in lead than the reverse. Many claims have been opened that are too poor to work, and others contain bordering bodies of rich and poor ore. The average contents of the ores handled for many months by the ore buyers and shippers were from $100 to $170 in silver, and from 20% to 40% of lead. This was since the Fryer Hill mines began to produce so largely. Their output raised the average value per ton of the total yield of the district. But while these figures represent the ore shipments, they were far above the yield of ores treated in most of the smelters. In some of these five tons of ore usually resulted in one of lead bullion, carrying 250 ounces of silver, indicating that 20% of the ore was lead, and that it carried 50 ounces of silver per ton before smelting. Ore that contains 100 ounces of silver and 25% lead would have a silver valuation of about $113, and a lead valuation of about $17. This refers to the value of the ultimate bullion product, not to the selling or buying price of the ore. Much vein matter is left in the mines or on the dumps that is too poor to handle. This carries silver and lead in varying quantities from $50 down to $5 per ton. Some carbonate mines yield gold in small amounts.

There are carbonates of lead, with some galena, various oxides of iron and manganese, and small amounts of chloride of silver. There are what are called "hard carbonates" and "soft carbonates." Some of the latter have the appearance of moist sand, or the material that railroad grades are made of. Some are gray and others stained red or black with oxide of iron or manganese. The hard carbonates are of different colors, but generally have a variegated gray appearance. The oxides of iron are rarely as rich as the heavy lead carbonates. Leadville district is noted for qualities always desirable, but seldom found combined, such as rich mineral in enormous quantities, easily and cheaply mined, and capable of being reduced at a small expense. These are the causes of the pre-eminence of some of the leading mines over most others that the world can show.

Friction and Lubrication.

Prof. Thurston, of the Stevens Institute of Technology, etc., London, points out that any substance to be efficient as a lubricating material must possess the following characteristics: 1. Enough body or combined capillarity and viscosity to keep the surfaces between which it is interposed from coming into contact under maximum pressure. 2. The greatest fluidity consistent with the preceding requirements—that is, the least fluid friction allowable. 3. The lowest possible co-efficient of friction under the conditions of actual use—that is, the sum of the two components solid and fluid friction should be a minimum. 4. A maximum capacity for receiving, transmitting, storing, and carrying away heat. 5. Freedom from tendency to decompose, or to change in composition by gumming or otherwise on exposure to the air, or while in use. 6. Entire absence of acid, or other properties liable to produce injury of materials or metals with which they may be brought in contact. 7. A high temperature of vaporization and of decomposition, and a low temperature of solidification. 8. Special adaptation to the conditions as to speed and pressure of rubbing surfaces under which the unguent is to be used. And 9. It must be free from grit and all foreign matter.

As the result of the study of the facts which he has ascertained, and of the consideration of the many hundreds of experiments made, the Professor shows that the great cause of variation with well cared-for journals is alteration of pressure, and it is seen that the higher pressure within the range of these experiments give the lowest percentage of loss of power by friction. The value of the co-efficient is seen to be greatly modified by the state of the rubbing surfaces; and the necessity of keeping journals in perfect order cannot be too strongly insisted upon. A single scratch has its effect in wasting power. A journal should have its surface as smooth and as absolutely uniform as a mirror: every well kept journal has such a surface. The resistance due to friction varies with velocity—rapidly at very low speeds, as from one to ten feet per second, and slowly as higher speeds are reached until the low changes and increase at ordinary temperatures takes place, and at a very low rate throughout the whole range of usual velocities of rubbing in machinery. The consumer, he says, will usually find it economical to use that lubricant which is shown to be the best for his special case without regard to price, and will often find real economy in using the better material sufficient to repay excess in the total cost many times over. The semi-fluid lubricants are usually the most economical, in consequence of their peculiar self-regulating flow as the rubbing parts warm or cool whilst working. Where heating is not to be anticipated maximum economy is obtained by the minimum rate of supply allowable, only if that supply be maintained with absolute uniformity.

The necessity of a lubricant as is well known arises from friction which is always present when two bodies or particles whether solid, liquid, or gaseous are compelled to move one upon another, rolling and sliding friction with solids, and fluid friction with liquids and gases. Fluid friction is found to vary with the square of the velocity, and is proportional to the area of rubbing surface, and is probably independent of the pressure. In hundreds of experiments with pressures varying from 5 to 275 pounds to the square inch he has found the friction of well lubricated journals to vary in such a manner as to prove that the law which governs such cases is quite different from that which applies with dry solids. When a lubricant is interposed between the rubbing surfaces of a revolving journal and its bearing, or between a sliding plane surface and its support, if acting effectively, it forms a fluid cushion, separating the surfaces more or less perfectly, as it is more or less viscous, and as capillarity is greater or less, thus giving the resistance to motion more or less of the character of fluid friction.

North Carolina Gold Region.

That portion of the State of North Carolina where the precious metal exists, according to F. R. Page, in the Boston *Economist*, is a slightly undulating country, rising slowly to the northwest to the foothills of the Blue Ridge, and embraces the upper and midland counties. The central portion is from 850 to 1,050 feet above the level of the ocean. The geological formation is granite and slate, modified in syenite, porphyry, gneiss and argillaceous shale, chloritic, talcose and mica slate, with dykes of trap-rock. A great drawback to mining is the difficulty experienced in separating the gold from the sulphurets of iron and copper with which it is associated, the quicksilver only picking up a very small percentage of the assay value by any of the processes now employed there.

The machinery consists of the Chilian mill for crushing and grinding, the drag mill, and the Burke rockers. A few mines have a stamp battery with copper plates.

The Chilian mill consists of a saucer-shaped stone, from six to ten feet across, hollowed out to receive the charge of ore. Two circular millstones, about one foot thick, are set on edge. There is a vertical shaft from the center of the first stone with another at right angles, passing through the center of the millstones, and extended out to one side. A mule is attached to the extended shaft to give motion to the millstones.

The drag mill has a similar stone hollowed out, with vertical shaft from center. There are arms to this shaft, to which round stones about one foot in diameter are attached by chains. When the shaft is turned, these stones are dragged around, and the charge ground and amalgamated.

The rockers consist of a trough about ten feet long, and two feet in diameter, dug out of a large pine tree, and the upper end stopped up, and a box with a perforated sheet-iron screen is set to receive the ore. Every 18 inches a channel is gouged out across the bottom of this trough. Between these channels a thin copper plate is tacked and quicksilver placed in them, also on the copper plates. Two crotch stakes are driven in on each side of the rocker, with a horizontal rail resting in the crotches. One negro shovels in the pulverized ore and water at the upper end, while another sits astride the rail and with one foot on one edge of the rocker, the other foot on the other edge, he keeps the rocker in motion.

No one has ever treated these sulphurets here by crushing, roasting, washing and pan amalgamation, or by the chlorine process, nor has much ore been sent away to reduction works. As the gold is mechanically combined with iron pyrites, great care must be used in roasting, or the charge will fuse and cake, or the gold be carried away by the rapid combustion and smoke from the sulphurets. By this means 25 % of the gold may be lost.

The gold in the roasted product will be partly covered with the oxides of iron formed, and prevent the quicksilver from taking up the portion so covered, and causing another loss. The addition of salt to the charge during the last of the roasting helps to clear these particles of gold, and a larger per cent. is obtained than by roasting alone.

By the chlorine process the roasted ores are put in a wooden tub and chlorine introduced at the bottom, until the gold is all chloridized. The tub is then filled with hot water and the chloride of gold dissolved. This liquid is then drawn off, and the gold precipitated as a brownish black powder, which has to be refined by heating with borax and soda.

This process, although more expensive than roasting and amalgamation, is probably the best for North Carolina sulphurets, as they contain but a small per cent. or trace of silver, and the iron pyrites, holding the gold, carries only a small per cent. of copper or none at all.

The sulphurets in some of the mines assay from $100 to $550 per ton in gold, and those from others could be concentrated to the same value or higher. Such rich sulphurets would pay to mine and sell, or would warrant the erection of proper reduction works to treat them there.

Inexperienced men have wasted capital here, receiving no returns, and very few mines in the section have been worked with any system.

New Mexican Silver Mines.—The New York *Tribune*, of late date, says: The intention of the Mexican government to assume control of the silver deposit in the Mohada or Dewey mountains, serves to confirm the report that a rich mineral district has been discovered there, producing ore that yields sometimes as much as 800 ounces of silver to the ton. The contemplated scheme may also be connected with the fear expressed by the Mexican journals that a rush to the mines from Texas will create a spirit of territorial annexation. As the district is within only 200 miles of the frontier, some Texans may desire to see it and the intervening territory added to their State; but if they acquire protection and comfort under the Mexican flag, they are not likely to abandon mining in order to engage in filibustering schemes. If, however, the deposits are as rich as reported, the people from this and other countries will not be deferred by Mexican misgivings from working them.

Spontaneous Fracture of Castings.

We took occasion in an article on the above subject, in a previous number of this paper, to refer to some of the causes which induced fracture in castings which must be attributed to spontaneity, or, rather, to the change of density from a heated to a cold condition, dependent more or less on its shape. We allude to the matter again because Mr. T. Wrightson, in a paper recently read before the British Association, throws additional light upon the atomic changes that accompany the cooling and contraction of cast iron. He has been able to determine, by experimenting upon the pressure of buoyancy of an iron sphere immersed in a bath of molten metal, that the maximum density of cast iron occurs when cold, and that its minimum density occurs when in the plastic condition just before liquefying or solidifying. This result clearly indicates that after a casting has been poured into a mold, it expands in volume at the moment of solidification, and from that point the contraction and density of the metal proceeds very rapidly, until quite cold. In the case of the cast-iron pulleys, then, the thin rim, presenting a large surface for radiation of the heat, and being also at the exterior of the mold, proceeds whilst cooling, first to maximum expansion, and then to contraction, without danger to itself, except from the rigidity of the mold, as the arms would be still in a plastic condition, and would offer no resistance to contraction. This allowance for contraction, in the non-rigidity of the mold, is usually so well understood nowadays, that few breakages of castings occur on that account. The cores, subject to the compression of contraction, are duly constructed, in part of straw or other inflammable material, so as readily to give way under the contracting pressure of the casting.

The case is, however, very different with the arms of the pulley if straight. These, in the usual course, reach their maximum expansion, *i. e.*, the moment of their solidification after the rim has contracted and set. The arms are thus "jumped" or shortened upon themselves at this period, and after this point the contraction sets in rapidly. But the arm of a two-foot pulley, forming a straight diameter across, must now contract nearly a quarter of an inch in linear measurement, whilst each of its ends is securely held by the already rigid rim. A fracture in one of the arms to allow free contraction is the obvious result, and when one arm has parted, there will be no reason for the other in the same diameter breaking. In some cases a large portion of this irregular contraction may take place without fracture by the metal "drawing" in places, generally where the arms join the rim or boss. The formation of the arms of pulleys in an "S" shape is for the distinct purpose of avoiding this danger from irregular contraction. The "S" arm, not being a rigid diameter, is more or less capable of adapting itself, by a change of shape, to a smaller contracted dimension. It is, however, remarkable how many founders still neglect such a simple precaution even as that.

A similar case to that of a pulley, as described above, for a long time caused considerable trouble and expense to a manufacturing firm. The casting was a frame for horse gear, consisting of an outside square frame, with four diagonal ribs supporting the boss in the center. The castings almost constantly broke, either before leaving the foundry, after reception into the erecting shop, or after delivery to the customer, and always in the same manner. Each of the diagonals fractured across one of its ribs, thus plainly showing it was the result of internal contraction. Sound castings were afterwards easily obtained by observing the precaution to part the exterior frame into two distinct portions, so that they could freely give to the internal contraction of the diagonal ribs.

A case of much interest, causing a long and serious arbitration, arose from the fracture, amongst other causes, of the inner shell of a steam jacketed cylinder of large diameter. The cylinder had been cast in one piece with its jacket, and, apparently, had no particular care paid to its cooling in the foundry. The result, in the light of the foregoing explanations, was unavoidable. The external jacket being situated in an exceptionally good position for the radiation of its heat, naturally cooled long before the internal cylinder shell, which could only cool by radiation towards the core. When, however, the internal shell cooled and contracted, its ends were each firmly attached to, and formed a part of, the already rigid exterior jacket. The result was evidently a condition of extreme tension in the interior cylinder shell endeavoring to part from the exterior shell or jacket. The metal of the cylinder was exceptionally good, so the interior shell had been able successfully to withstand the very considerable tension until after the engine had been put to work. Then the varying temperatures to which the cylinder was subjected, sometimes colder and sometimes at a temperature of about 300° F., at last caused the overstrained atoms of the interior shell to part, at one end around a portion of the circumference, and in the center around the other part of the circumference.

Embarrassing accidents frequently happen in the fracture of the value boxes of deep-lift pumps, the casting here being peculiarly liable to irregular contraction. The remedies against such accidents are evidently two in number. First, to so construct the casting that its form shall be capable of yielding to such irregular contraction should it take place, and that the

equal sections of metal used shall ensure uniformity in cooling; and second, to take such precautions in the foundry that the casting shall cool equally throughout by the artificial cooling of such parts as may naturally remain hottest the longest, or by the artificial heating of such parts as may cool too rapidly. It should be remembered as an axiom that no irregular tension will be set up if the casting can be made to cool uniformly and isochronously throughout.

Homer District, Mono County.

This new mining district was formerly a portion of Tioga district, and is situated at the head of Mill creek. The Bodie *News*, speaking of a recent visit to the district, says: The road from Bodie is either by way of Cottonwood canyon or the Mormon Ranch, the latter being preferable, and the distance to the lake is about 22 miles. From Mormon Ranch the road leads through Keith to South Bodie district, leaving Summers' Ranch on the right, and thence to the canyon known as Mill Creek canyon. The grade leads up for a distance of three miles, and is one of the easiest to be found in the mountains. On either hand rise up huge boulder-covered mountains, showing unmistakable evidences of the glacial action of centuries, which, in their frozen course, have left boulders and rocks of all sizes along their route, embracing all varieties of the mineralogical kingdom. A rushing, roaring torrent of pure foam-crested water makes its impetuous way down the canyon and is lost at last in the alkaline waters of Mono lake, some six or seven miles below. Following along this picturesque mountain torrent, we come to a view of almost unrivaled magnificence and grandeur. Nestling in the depths, made probably by some historic crater of an extinct volcano, we find an expanse of clear mountain water, named Lake Wasson, from our new member of the Legislature, Hon. Joseph Wasson, whose placid depths make homes for thousands of the finny tribe. This sheet of water is one mile long and about one-quarter of a mile broad, and is supplied and kept full to overflowing by a continuation of the stream found below. At the foot of this beautiful spot we found camped several adventurous prospectors and others, among whom we noticed Judge Owen and James Mathews from Bodie, who had taken time by the forelock and pre-empted a mill and town site, as also located several fine appearing ledges in the mountain beyond. A trail leads along the bank of Lake Wasson to the home of Mr. Landy, which we found to consist of a home-like log house surrounded by a large growth of pine and tamarack. After a long and dusty ride, this oasis in the desert was doubly inviting. Away up 4,000 feet above the level of Mono Lake rose towering and bald-faced crags over crage, until they ended only when the granite-capped apex was reached. The country rock consists of quartzite, granite and slate, the granite forming the cap-rock—and the mineral is found in enormous veins at the very surface of the ground. The May Landy, the newest sensation, is located away up on top of the mountain, and specimens from there show free gold in large quantities. The ledge, as uncovered, shows a width of two and one-half to ten feet, and free gold is found in the rock in abundance. The direction of the ledge is about north and south, and it can be traced for a length of four miles. Numerous locations have been made, and the 40 or 50 prospectors in the district seem highly elated over the future of the camp. Wood and water are in unusual abundance, and mining can be carried on by means of tunnels with much less expense than elsewhere. Without doubt, the surface appearance of the district is such as to warrant the investment of capital, and already several mining speculators have made arrangements, by bond and otherwise, for opening up claims there. The immense placer fields which are found extending all along down the canyon leading to the mines were worked with most successful results many years ago, and still exist as evidences that great quartz ledges are to be found somewhere in the near vicinity. For years other and more enticing fields have attracted the miners away from this section, and the impossibility of getting in supplies in the winter months, and the expense attending the same during the summer, have detracted much from the really meritorious nature of this section of Mono county. Now, with easy communication, and a firmly fixed market at Bodie, there can be no doubt of the eventual greatness of Homer district as a mining center. A road has been surveyed along the shores of the lake, and with the expenditure of money could be continued over the Sierra Nevadas to the Yosemite valley—only 35 miles distant—thus making a feasible route for tourists in the season. The climate is milder than at Bodie, and we are told by old residents of the vicinity that the snow never lays so long or so deep there as elsewhere in the county. Game is said to abound in the hills and valleys, and cereals can be raised with success and certainty. Near Mill creek is Summers' Ranch, where this season has been cut $40,000 worth of hay, the ranch being valued at $60,000. Vegetables also grow in abundance, and thousands of acres of land lie awaiting the manipulations of the husbandman.

New Metals.—Eleven new metals have been discovered within the last two years which have received the following names: Davium, moeandrium, phillipium, ytterbium, decipium, neptunium, lavæsium, norwegium, uralium, scandium and thaumasitic.

Useful Information.

Prussian Blue from Red Oxide of Iron.—It is well known that Prussian blue is ordinarily manufactured from the protosulphate of iron and ferrocyanide of potassium, by which process a pale blue precipitate is at first obtained, which acquires the characteristic dark blue tint by exposure to the air, whereas, the persalts of iron when treated with the ferrocyanide of potassium at once assume the desired dark blue color directly the respective salts come in contact with each other, and Mr. Alex Watt, of Battersea, has taken advantage of this well-known chemical fact in working out his improvements, the object of which is the treatment of native red oxide of iron by chemical and mechanical means, whereby is obtained economically certain products which are useful in the arts—Prussian blue, jewelers' rouge, and a red pigment suitable (when mixed with oils and such usual ingredients) for coating iron and other surfaces. For the purpose of his invention he treats red iron ore (peroxide or sesquioxide of iron) with strong hydrochloric acid, and with the assistance of moderate heat, whereby he obtains a very rich solution of perchloride of iron at a very moderate cost. The solution thus obtained is afterwards diluted with water, and the Prussian blue precipitated in the ordinary way by ferrocyanide of potassium. The blue pigment is then washed and treated as usual.

Refractory Bricks and Furnace Linings. A new material for basic linings and bricks has been recently made by S. G. Thomas, of Battersea Park, England. He mixes lime with liquid tar, so as to moisten it and render it somewhat plastic. When the silica and alumina are low a little oxide of iron may be mixed with the lime before adding the tar, the oxide of iron acting as a binding material. He uses these mixtures either to ram the interior of converters or other iron and steel furnaces, particularly their bottoms, or he makes it into bricks and tuyeres under very great pressure. The bricks he prefers to fire at an intense and prolonged heat. He also uses this mixture when made rather liquid as a cement for calcareous bricks; crude creosote may be substituted for tar when it is readily obtainable. He also uses a mixture of very highly fired hard shrunk lime made from the silico aluminous magnesian limestones (such as described in a former specification) with crude petroleum or similar cheap oils as a material to use for rammed linings, particularly bottoms and hearths, and also to make bricks of. In all cases when using this mixture of petroleum and highly fired shrunk lime he exposes the linings and bricks (after the linings are in position or the bricks made) to a further very intense and prolonged firing. This mixture also may be used as a cement for basic bricks.

Spurious Coloring of Wine.—Mix together equal parts of diacetate of lead and the wine to be tested, well shake and filter. If the wine be pure the filtrate will be quite clear, but if colored with aniline it will be more or less colored, according to the amount of coloring present. Another method is to add a solution of caustic potash, in sufficient quantity to neutralize the acid. If the wine be pure it will first produce a bright red coloration, than after a short time turn to bottle-green, and then to a brownish green, but no precipitate is formed; but if the wine has been artificially colored the following colorations will be produced:

Wine colored with	Color Produced
Elderberries	Purple
Logwood	Reddish Purple
Mulberries	Purplish
Beetroot	Red
Litmus	Light Violet

A good test for logwood is to evaporate the wine to dryness, and then add hot water with a little alum, which will produce a blue coloration if the wine has been colored, but will have no effect if the wine be pure.—*English Mechanic.*

Lubricants.—The choice of a lubricant is frequently ill-made. Common kerosene oil is too often injudiciously used in place of a thicker or more bland oil, because the heat produced by the friction rapidly vaporizes the oil and leaves the journal dry. Crude petroleum for the same reason is fitted only for very slowly revolving journals, such as water wheels. For very heavy machinery, or for gearing, tallow and black lead rubbed up together is the best lubricant, and is also the best for wagon and carriage axles during the hot weather. For light-running machinery sperm oil is the best; good olive oil, that has not become rancid and acid, is perhaps the second best, and for winter use lard oil is excellent, but is rather too drying to be a first-class lubricant. Castor oil is better for axles in the winter, and black lead with it is a help at any time.

New Preparation of Carbolic Acid.—Messrs. F. C. Calvert & Co., of New York, have introduced for domestic disinfecting purposes, solidified disinfecting tablets containing 50% of concentrated carbolic acid. The great advantage of this solid form is that it removes the danger of accidental poisoning, and from the high percentage of acid present, the tablets provide, even when dissolved in a considerable quantity of water, a solution capable of arresting all kinds of putrefactive change, and of destroying all the lower forms of insect, vegetable, or germ life.

Ductile Zinc.—In order to remove from plates and other forms of zinc its natural rigidity and consequent frangibility, which render it difficult to work and greatly limits the range of its use, Mr. James Eade, of Waltham New Town, proposes to subject it to special treatment. Supposing sheet zinc is the material to be treated he prepares a bath of linseed oil, and into it he plunges the zinc plates, subjecting the same to the action of oil while in a state of ebullition for 30 minutes, more or less, according to the thickness of the metal; he then removes the plates from the bath, and after the oil is drained therefrom he cleans their surfaces, when they will be ready for the market. Plates treated after this manner will be found to possess great ductibility, and to be capable of receiving and retaining a high polish; they may be employed in lieu of lead or pewter at a great reduction of cost for a variety of purposes, as, for example, the linings of sinks and cisterns, and the covering of counter and other surfaces requiring a protective metallic covering. It is proposed to treat other articles than plates in a similar manner to that above described to facilitate the working of the same into various forms.

New Percussion Cap for Dynamite.—Parties in Dusseldorf have devised improvements in caps for dynamite, which consist, first, in weakening the bottom of the cap, by a ring or cross; secondly, in closing the cap as firmly as possible at the top, which is effected by placing a conical copper cap within the same, provided with a hole in its bottom; and thirdly, in strengthening the sides of the cap as much as possible. Detonating caps, as is well known, serve to explode dynamite and similar substances by a strong shock and great heat. By concentrating these as much as possible towards the center of the exploding cartridge or blasting hole charge, the latter are rendered the more reliable. The conical copper cap can also be held within the outer cap by narrowing the mouth of the latter. The manner of applying the above-named principles of construction may be varied as desired according to circumstances.

Galvanic-relief Plates.—A recent French patent contemplates the embellishment of metallic plates, to be tinned or galvanized, by submitting them, after being suitably polished and grained, and printed upon with the pattern to be shown in a greasy ink, to the action of an acid bath, by which the exposed parts of the plate are bitten in or deepened, and the parts protected by the ink are left in more or less relief as may be desired. The necessary relief having been secured, the plates are removed from the acid bath, the ink removed either with aid of heat or of solvents, and the plates submitted to the galvanizing or tinning bath, or to an electro-plating process, as may be desired.

Good Ink.—A commission lately appointed by the Prussian government, to investigate the best class of inks to be employed for official use, state that aniline inks are not suited for this purpose, because they can be easily washed away, especially by preparations of chlorine. Inks, in the composition of which alizarine (Adrianople red) is employed, can be obliterated less easily; but they are of opinion that the best of all is made from gall nuts and a salt of iron, the old description of ink.

Good Health.

Care of the Teeth.—Rare, indeed, do we find a person of 30 years of age with a sound set of teeth. Far more often do we find young lads and girls of 10 to 16 years of age whose teeth are mere shells of decaying tissue, rotting away with almost visible rapidity, depositories of decaying particles of food, and the source of contaminating elements which deteriorate digestion, and offensive odors which contaminate the breath. In connection with this, it is said that there are 12,000 dentists in the United States, who annually extract 20,000,000 teeth, manufacture and insert 3,000,000 artificial teeth, and consume about three tons of pure gold, to say nothing of the enormous quantity of mercury, tin, silver and other metals used as "fillings" for carious teeth. We have this upon the authority of *Good Words*, and can only add that judging from the vulcanized rubber required for gums and plates, the rubber-tree cultivation must needs be assiduous.

Prize for Essay on Diphtheria.—The Empress of Germany has offered a prize of 2,000 marks ($500) for the best essay on diphtheria. The conditions are that the writer is to bring forward important *new* facts as to the essential nature (*das Wesen*) of the disease, especially with regard to the infectious matter which propagates it, its dissemination, and the means of arresting its progress. The essays may be written in German, English, or French, and must be sent to Prof. v. Langenbeck, Berlin, N. W. 3 Roonstrasse, on or before December 15th, 1880. The committee which will award the prize consists of Professor Klebs of Prague, Liebreich and Virchow of Berlin, von Nageli and Oertel of Munich, and Thiersch of Leipsic. Each essay is to have a motto corresponding to a similar motto on a sealed envelope containing the author's name.

Painless Death.—In one of his lectures Prof. Tyndall spoke of the great probability that entire absence of pain accompanied death by lightning. It is popularly supposed that an impression made by the nerves, a blow or puncture is felt at the precise instant it is inflicted, but such is not the fact. The seat of sensation is the brain, and intelligence of the injury must be transmitted to this organ through a certain set of nerves, acting as telegraph wires, before we become conscious of pain. This transmission or telegraphing from the seat of injury to the brain takes time, longer or shorter, according to the distance of the injured part from the brain, and according to the susceptibility of the particular nervous system operated on. Helmholtz, by experiments, determined the velocity of this nervous transmission in the frog to be a little over 85 feet per second, in the whale about 100 feet per second, and in man at an average of 200 feet per second. If, for instance, a whale 50 feet long were wounded in the tail, it would not become conscious of the injury until half a second after the wound had been inflicted. But this is not the only ingredient in the delay. It is believed that in every act of consciousness a determined molecular arrangement of the brain takes place, so that, besides the interval of transmission, a still further time is necessary for the brain to put itself in order or its molecules to take up the motions or positions necessary for the completion of consciousness. Helmholtz considers that one-tenth of a second is required for this purpose. Therefore, in the case of a whale, one second and one-tenth would elapse before an impression made upon its caudal nerves could be responded to by a whale 50 feet long.

New Properties of Carbolic Acid.—The chemistry of carbolic acid has recently become better understood. For instance, Staedler has shown that it is a constant constituent of the urine; Brieger has shown that it is a normal constituent of the contents of the bowels; and Baumann has discovered that it is one of the products of the putrefaction of albumen. Dr. Jay has lately discovered that it is a powerful deoxodizing agent, and shows this property by experiment. He oxidizes Guaiacum resin with potash, manganese, iodium and chlorine, and deoxodizes it as well as restores it to its normal color by the addition of carbolic acid. A very curious reaction is effected by this acid upon iodine. When carbolic acid is added to tincture of iodine no perceptible change takes place, but when carbolic acid is added to tincture of iodine freely diluted with water, the fluid is almost instantly decolorized, and a compound is formed which is incapable of acting on starch and turning it blue, as free iodine does. Whence the Doctor thinks this combination might form a good antiseptic dressing for wounds. The investigations of Pasteur, Tyndall, Sanderson, Lister and others have clearly shown that putrefaction changes never take place without the presence of bacteria; and, further, that the bacteria are dependent on oxygen for their existence. The deoxidizing properties of carbolic acid would prevent the formation of bacteria.

Summer and Its Diseases.—This is a bright volume of the *Health Primer* series, published by Lindsay & Blakiston, Philadelphia, and for sale by A. L. Bancroft & Co., S. F. It is, however, more adapted to a variable climate, where "the changing seasons remind man that the seed is not quickened except to die, and each one brings to him, as it comes with its many blessings, some new suffering and sickness." The book aims to point out the causes of summer sickness, and by proper warnings enabling all to avoid those combination of causes which bring about so many death strokes in summer. "Preventive medicine is the highest development of the healing art." We can avoid occasions much more easily than we can combat maladies already established. The series may be considered a "blessing" in literature. Dr. Wilson is the author of this last one, and all stand upon the highest medical and scientific authority.

Coal Oil as a Pain-Killer.—The efficacy of coal oil as a pain-killer is not generally known, nevertheless it has curative properties to a remarkable degree. This was illustrated by an incident which happened at the Talisman mine a few days ago. On Sunday afternoon a man named John Jones was sitting in the hoisting works, when a large black spider, of the venomous species, bit him on the side. It caused great pain, and the resources of the workmen were taxed to suggest means to relieve the sufferer. At length Mr. Green, the engineer, got some coal oil and applied to the affected part, when the pain ceased almost instantly, and no trouble has since been experienced from the bite.—*Amador Ledger.*

Borax and Nitrate of Potash for Hoarseness.—These two salts have been employed with advantage in cases of hoarseness and aphonia occurring suddenly from the action of cold. The remedy is recommended to singers and orators whose voices suddenly become lost, but which by these means can be recovered almost instantly. A little piece of borax, the size of a pea, is to be dissolved in the mouth ten minutes before singing or speaking; the remedy provokes an abundant secretion of saliva, which moistens the mouth and throat. This local action of the borax should be aided by an equal dose of nitrate of potassium, taken in warm solution before going to bed.—*La France Medicale.*

MINING AND SCIENTIFIC PRESS.

W. B. EWER.....SENIOR EDITOR.

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The Week.

This week has not been remarkable for any unusual stir in mines proper, if we may except the alleged extremely rich discovery of ore in the Sierra Nevada mine. The sturdy miners and prospectors are making their efforts felt in every direction by bringing to notice profitable claims of gold and silver ore. Mono county mines are appreciably gaining in importance. The hydraulic mining business is assuming huge proportions, as reports indicate preparations on a large scale.

Perhaps the most noticeable event of the week is the alleged discovery of immensely rich ore in the drift on the 2300 level of the Sierra Nevada mine on the Comstock, choice samples of which are said to have assayed from $1,027.42 to $1,394.40, while the average of five samples taken across the face of the drift was $668.20. The ore is chloride and sulphuret, carrying a large proportion of gold.

The Indian troubles in Colorado have been quieted and whatever interference there may have been with mining pursuits in that State has been removed by the settlement of the difficulties with the Utes.

The Land Commission now in session in this city has entered upon a task of great importance, and it is to be hoped that out of the multitude of opinions offered a reasonable medium may be found which will lessen the evils claimed to exist if not entirely cure them.

THE first set of hoisting works sent from here to the Black Hills has been shipped by Parke & Lacy to the "Clara and Pierce" mine. It consists of a pair of 10x12 engines, with five-foot reels and cut gearing. Although the Black Hills country is so much nearer the East than here, our agents and manufacturers do get an order occasionally. Two of the largest mills in the Hills were made in this city.

CASSIAR miners are going to Sitka.

A Serious Undertaking.

The United States Land Commission has now fully entered upon its important task of ascertaining from expert testimony the proper information necessary to bring about a change, or modification in the laws and regulations applicable to our mining and agricultural interests. Its sessions are well attended. There is no difficulty in procuring the opinions and experiences of men who have carefully examined into the causes of the confusion which prevails in regard to these paramount interests of the Pacific States and Territories.

It will not be an easy task to frame laws and regulations which will cover every conceivable question which may arise with reference to land matters, or which the ingenuity of the human mind may suggest for solution. The fact of the existence of this Land Commission appears to demonstrate that the accumulated changing circumstances of different localities, various manners and customs, cannot, except to a certain extent, be governed by any general laws. There are a multitude of intricate questions constantly being presented for settlement, which are all the more important on account of the near approach of apparently conflicting interests. We refer to the claims of miners and farmers. We expect to hear very many conflicting opinions upon the points which may be, and have been already, raised by these two classes of our population, which combined constitute its wealth and greatness. But these opinions will undoubtedly be founded upon years of experience and formed after mature deliberation. Whether any good results will accrue through the Commission can only be hoped. The point to be feared in matters so important to the public welfare, is that too much meddling with existing and tried laws will bring upon us the very evils that people in general are seeking to avoid.

Many defects in existing laws arise from the incompetency of those possessed of the authority of executing them; many claims have been lost through blunders of the parties themselves, or their attorneys, and there has been too much "sticking to the bark," the spirit of the law having been persistently ignored. The law is not censurable for mistakes of misconstruction or misunderstanding, so we must lay aside the opinion that the law is inadequate, defective and incompetent. To assert it is to utter a parody upon our power of self government.

The changes that are recommended by the witnesses so far, are not of a sweeping character, but refer more to the condition of things in a peculiar locality. For instance, a Comstocker thinks the square location with vertical side lines the very best, although it would not do where there is a pitch to the lode, as in the case of the Comstock. An appeal to nature to straighten up all lodes would be in place here, for the witness from a mining region containing lodes seriously afflicted with "dip" declares the square location to be an unjust one, for the locator of a claim or lode ought to be allowed to follow it wherever it goes, within the limit of the end lines. Another witness thinks it would be very unwise to give the subterranean or mineral wealth of the lands to surface owners. We might fill several columns with the various opinions offered and remedies proposed, but there is nothing that has not been repeatedly mentioned in local newspapers or on the rostrum.

Upon the debris question there are no new ideas advanced. The interests of the miner and farmer are distinct, but need not necessarily conflict. The importance of both is so well understood that it seems to be nonsense to argue about it. Whether the debris business will ever be settled to the satisfaction of all the parties is a question which time alone can determine. It is, perhaps, certain that a mere law will not apply a perfect or satisfactory remedy. This seems all the more probable from past experience in laws — constantly changing and seemingly never settling any question like that involved in antagonistic interests. Law is too much regarded as a stern, unyielding principle of justice, a sort of a "break but not bend" affair, and the question of expediency being left out, the American mind is prompted to rebel when his common sense declares that the spirit and not the letter of the law should be maintained.

There are principles of equity in this debris question which no law can, in our opinion, reach. It may be regulated by law, but the principles of equity are too æsthetic to be reached by legislatures; they border upon the conscientious, and over conscience the governing power has no control.

At the bottom of the difficulty lies the doctrine that every man should use his own property so as not to injure the property of another. This doctrine is accepted from an old and well-known maxim, which is frequently urged in courts. But it appears to everybody, and one man cannot in justice urge it in his own behalf, while the fact of his requiring its application to his own particular circumstances and surroundings, would operate as a violation of it applied to the circumstances of others. The same law which says to every man "you shall be protected in your legal rights," also says in its spirit: "If the use of your legal rights operates to the detriment of another, you are violating an equitable principle which you cannot be compelled to adopt, but which is nevertheless 'good conscience.'" This majority of mankind naturally comprehend the distinction between law and equity, or what may be termed the "governing element" and "good conscience," but do not fully see that there is no affinity; hence the desire to change the law originates mainly in the desire or hope of uniting these two heterogeneous principles between which there is and can be no affinity. Equity is left solely to common sense We notice in the various opinions offered before the land commission, this undercurrent of desire or hope, which can hardly be realized practically. Hence, we say, the undertaking of the commission is a serious one. It must confine itself to points relating to government, and cannot, although it will be expected to, enter into the domain of equity and enforce the operation of conscience.

Plate Amalgamation.

In selecting a suitable metal for amalgamating plates the most important point to be taken into consideration is its action with quicksilver. All the base metals to which quicksilver adheres at all are more or less soluble in that substance, and in proportion to their solubility are they unfitted for the purpose. Zinc for instance, which readily amalgamates with quicksilver, and at first presents a very fine surface for gold-catching purposes, very soon dissolves to a thick amalgam, and on the addition of more quicksilver becomes liquid, and is of course worthless. For this reason copper has been settled upon as being the least soluble of all the available cheap metals for mill plates, but copper has many and serious objections, and in the long run cannot be considered near as cheap as if it were at first heavily plated with silver or even gold itself, which is admitted by all to be the best agent for bringing quicksilver in contact with fine particles of gold in pulp. It is noticed in mill mortars crushing gold ores that wherever a little stray amalgam finds lodgment it rapidly increases in quantity. As soon as a copper plate is coated with quicksilver, the quicksilver begins to eat into or dissolve the copper and the particles thus liberated float to the surface, where coming in contact with air or other salifying agents, produce that extremely annoying film known as "verdigris," and so prevent the contact of gold and quicksilver necessary to amalgamation. This action or solution, though extremely slow, is sure and certain, and continues as long as the two metals are exposed to direct contact. The coating of mercury on a copper plate, though usually very thin, always has an appreciable depth, sufficient at any rate to permit of the movement and arrangement by gravity of particles held in suspension therein, and as the copper is slowly dissolved away the place of its atoms is immediately filled with others of denser gold amalgam, and the form of the plate is thus preserved, though in substance it is gradually changing from copper to gold amalgam.

This process is, of course, more rapid in the beginning, when the mercury has free access to the copper than it is later on after more or less gold has intervened between the two metals, and it gradually diminishes until the "verdigris" or oxide of copper only rises in such small quantities that it is ground off by the action of the running pulp on plates in active use as fast as it forms, and not until plates reach this condition are they presumed to be in good shape for gold saving. But the fact that the verdigris continues to rise in small quantities may easily be proven, for if we take one of these plates, no matter how old, so long as there is copper left in it at all, and place it under conditions which will allow the copper to oxidize (and we can hardly place it under other) we will find that in time a green film will form on the surface of the mercury. Now a plate that is sending up verdigris, even in the smallest quantities, is not as good as one that does not, and therefore a copper plate never does become the equal of a gold one, and is never considered in prime condition until it has actually accumulated and secreted more than enough gold to form a plating sufficiently heavy to insure insulation of the quicksilver from the copper, even in case of the rather severe scraping with steel tools to which it may be subjected. It cannot be doubted that the gold so accumulated could be much better applied as a plating, for it would then present a smooth, solid and even surface, and practicably invulnerable to the inroads of the quicksilver, whereas by the present method it is slowly deposited as a hard amalgam, which eventually renders the plates so brittle that they become fit only for the fire.

The fact that a new or "green" copper plate absorbs gold much faster than an old one, serves in a limited measure to explain the very common disappointments attending experiments with them, and that the first clean-up in new mills usually falls short of expectations.

Although copper plates, heavily plated with gold would certainly be much cheaper, cleaner and more effective than raw copper, we do not know of their having been adopted in any instance, though there is a growing demand for silver plated which appear to give general satisfaction and to be an acknowledged improvement. Although silver is practically non-oxidizing under ordinary circumstances and nearly as insoluble in mercury as gold itself, time may develop defects as yet unseen.

Wasted Gold.

The amount of gold heretofore wasted by ancient manipulations, if twenty or thirty years ago may be termed ancient, is almost incredible. It is a fact, however, which miners have for several years realized, that there is an immense field for productive mining in merely working over refuse and tailings, and collecting the gold which has been wasted. Indeed there is hardly a doubt that it will pay better than some original workings, considering the lowness of the expense. Upon this subject the Amador *Dispatch* says: "Recent assays of the old heap of refuse matter at the Good Hope mine near Jackson, showed from $15 to $30 per ton in gold. This matter was not considered worth milling, in fact would not pay the hauling and milling expenses."

Again, in Plumas county, at Chapsrral hill, the old-time mining camp known as Mount Pleasant contains untold wealth. Thousands of dollars have been cleaned up in the old worked-over placers, and Chinamen are still working them over. Crossing the ridge to the old Fales Hill claims we find that the latter are 85 feet lower than the bedrock cleaned off at the Mountain House, and that there is one mile of channel which has never been touched, being probably 500 feet deep of wash gravel and quartz from surface to bedrock. Every miner who ever worked there has been of the opinion that buried there is enough of the shining dust to make capital for an army of men, but the ground although claimed frequently has always been abandoned, and so far no work has been done to develop the enormous channel. The two rims show that it must be more than a quarter of a mile wide, and on the north, or Feather river side, some very large springs break out and flow down towards the river.

The mines of Tuolumne county are yielding more gold at the present time than in early days, proportionate, of course, to the number of workers. Gold seekers are now less by thousands, but the production of gold has by no means decreased in the same ratio. Continuing in this strain the Tuolumne *Independent* remarks that: "The mines worked to-day are of a more permanent nature, and increase in value as they are more fully developed. Placer mining, from its very nature, was of brief existence, and in many instances, doubtless, destroyed more ground for future usefulness than all the gold taken out would pay for many times told. In fact, as a mining section, we believe the county has hardly yet been prospected. It is only in spots that we have an indication of the rich stores buried deep beneath the surface; how deep no one has knowledge. The thousands of acres yet untouched for mineral, except by scratching on the surface, is doubtless laced beneath with veins of gold-bearing quartz; and the gravel beds of many miles in extent and unknown depth, have as yet remained unvexed by the little giants so busy in other sections of the State. The immense deposits of gold in the ancient river beds under Table mountain, running through the county, have also remained undisturbed except at one or two points, which but sampled the value of the miles of golden channels yet covered by the debris of centuries. Tuolumne, as a mining county, is yet in its infancy, not dreaming, even, of the wealth future years will reveal."

There is hardly a gold producing county in the State that does not contain vast resources of undeveloped wealth, either in old refuse or in undeveloped continuations of old mines, which may truly be termed "wasted gold." Upon the point of our resources the Grass Valley *Union* truthfully says: "For hundreds of miles along the western base of the Sierras are gold-bearing veins and placers awaiting development that will yield a profitable return to the energy and money of the capitalists who will yet seek this field as one of the best and most reliable to be found on the globe. Here will be found every facility of a kindly climate, accessibility, cheap and available power, and every concomitant that can make the business profitable above the cost of production. The gold mines of California, notwithstanding the vast treasures they have given to the world, are comparatively unworked fields. The gold-bearing veins are practically without limit, and the dead river channels are only beginning to yield their inexhaustible stores. This is not an overdrawn estimate of the gold fields of California, and far-seeing men are beginning to realize the importance of giving more attention to them as a source that will be lasting and reliable in keeping up an equable production of the metal that is pre-eminently the need wherever the wheels of industry are in motion or commerce spreads its sails."

HALF-RATE NIGHT TELEGRAMS.—We are informed by the Manager, F. Drake, Esq., that on and after the 1st of November next the Western Union Telegraph Co. will transmit messages offered any time during the day or evening, but sent *after* all other business is clear at night, and deliver the same next morning, at one-half commercial rates, the tolls in no case to amount to less than 25 cents. Messages will be received under this arrangement for any Western Union office in the United States.

THE value of the exports for the last quarter from Victoria, B. C., aggregate $817,134.

An Eastern Mining View.

Judging from an article upon Colorado as a mining country in a recent issue of the New York *Mail*, Colorado is exciting the Eastern mind more by reason of its mineral wealth than its Indian troubles. It says: From the present and daily increasing indications, it is obvious that the bullion output from Colorado, before long, will equal, if it does not exceed, that of any other State or Territory in the Union. The vast and continuous mineral belts continuing from Boulder county to San Juan point, in our humble opinion, to the slopes of the main ridges of the Rocky mountains, as the future big bonanzas which will, at no very distant day, far surpass in yield anything yet produced in California or Nevada. All geological theory points incontestably to such a conclusion. We are not disposed to be hypercritical so far as the success of any of our neighboring States and Territories is concerned in any department of wealth-producing material. On the contrary we feel that the success and welfare of all or any contributes to a common advantage. It is not necessary, however, to establish an incontestable fact upon a geological *theory*. A conclusion founded upon such a basis is apt to occasion a fear of lost prestige on the part of the rest of the Rocky mountain region.

The *Mail* feels the lack of adequate smelting and refining works, and thinks a branch mint should be added, inquiring upon what intelligible grounds mints should be kept up at New Orleans and Dahlonega so far removed from any metal-producing centers? As to the smelting and refining works there can be no question that when those actively engaged in mining find it profitable to erect them, or when the output will justify the expense, there will be no lack of machinery and works. So far as the mint is concerned, there are very good ones at San Francisco and Carson City, and the establishing of others to turn out more tons of silver coin to be used as storing material in the vaults thereof, might not be a truly profitable investment for the government. Of course, if there arises a necessity, the *Mail* need not fear that the want will not be supplied.

One of our late exchanges complained of the damage done to the mining interests of Colorado by Eastern investors, who have a custom of buying mines, putting up extensive works and improved machinery for the purpose of turning out bullion, and when everything else is ready, the mine is examined and found not productive, obliging the abandonment of the works and the loss of much capital. Such a *fiasco* is not uncommon, because the old saying, "All is not gold that glitters," is apt to be overlooked in the highly colored local accounts of mines, and the fact that a mine may have very little pay ore in it, disregarded. The doctrine of "*Caveat emptor*" applies to the purchase of a mine as much as it does to that of a horse. We make these remarks in the hope of putting the *Mail* on its guard against erecting smelters and mints without necessity. Colorado is an immense country. Indeed, all and every one of our Rocky Mountain States and Territories are too immense to be generalized. Carbonates and chlorides and tellurides are not found everywhere, however, but they exist in well-known and well-defined localities, and though very rich, yet when a whole State or Territory is spoken of as the universal depository of the precious metals it is indeed a geological theory. The *Mail* declares that "the best developed fissure veins of Colorado are little better than insignificant holes in the ground compared with the solid engineering work in mining which exists in Nevada, where a depth of 2,400 feet has been reached in shafting, and everything connected with the work done on a scale and in a manner unequaled in the world. An opinion that we have heard frequently confirmed by European engineers who have visited Nevada and expressed their great surprise and admiration at finding scientifically planned and skillfully executed work extended to perfection, where they expected to find little beyond the most ordinary and temporary work. Above all stands the Sutro tunnel as one of the grandest works of any age, bold and admirable in plan, and no less admirable in execution, a work whose effects on the rich ore beds for so long flooded and unproductive will, unless all well-defined theories and actual experiences are utterly at fault, develop an output of the precious metals which will fully repay the labor and money expended on it," but comes back again to the uppermost thought in its mind, engendered possibly by reading up "Little Pittsburg," and says that "Colorado, too, is already having her tunnels, though, of course, not on a scale that will at all compare with the Sutro." This frank statement relieves our fears of being surpassed, and brings Colorado to the level of all our other gold and silver-producing States, where it must remain, and every effort to magnify it or any other State or Territory into a vast bonanza, geologically constructed to astonish the world by its extraordinary output of precious metals, will only bring a bad return in the shape of lost fortunes and disappointed hopes. The geological *facts* are that the whole Pacific coast region is rich in precious metals, and not only does not show any signs of exhaustion, but is showing continual new and rich discoveries. With us, in this State, mining is not continually alluded to because other and valuable interests have been conjoined. Our interests as regards the precious metals have developed into a steadier and quieter business than in now mining regions where, in the fever of excitement, every strike of any portent is made a bonanza that will cast the rest of the world in the shade. Because some of our capitalists invest in outside mines is not a reason for exaggerating the resources of any region. Capitalists may possibly make more money by speculating in mines, as a real estate agent would in corner lots, hold them for a rise, for instance, than in actually working them. Such things have happened, and are likely to continue. Again because our capitalists have largely invested and are working rich mines in Colorado, let no man infer that there are plenty other mines equally as rich. The best locations have undoubtedly been selected, and the California capitalist is not the one to let valuable new ones get far away from his reach.

How Mining Should be Conducted.

Legitimate mining should be conducted with the same rigid economy that renders mercantile transactions more liable to be successful. The merchant studies closely the cost of his merchandise, examines and scrutinizes its quality, and places a fair profit upon it when offering it to a purchaser. If he deviates from these principles, a failure will be the termination of his operation. When mining is brought under the influence of these principles, its success may be safely assured. The merchant studies the cost of his merchandise. The miner certainly should do so also, whether the cost consists in the price he pays for a mine, or in the expense attendant upon working it. If he pays an exorbitant price for the property, too much for the labor expended in its development, too high a price for the material used in prosecuting the work, he will soon learn by sad experience that by deviating from strict economy he has brought about his own ruin.

A disrepute has been cast upon mining by the reckless and careless manner in which investments have been made in mines. Instead of a rigid examination as to the quantity and richness of the ores, extent and probable durability of the vein, under the impulse of a wild, speculative disposition, injudicious outlays have been made, and properties purchased or explorations instituted, where, under a careful scrutiny, not a dollar would have been expended. If any mining district is visited, the surface of a great portion of it will bear evidence of the truth of the above assertion.

If the merchant pays too much for his goods, he can get back in their sale a portion of his money, for they possess a tangible value. If the miner sinks useless shafts and prosecutes useless labor, the loss is total to him, for there is nothing in its results that can by any possibility be rendered available. Our mining camps are full of actual texts of this description, each one of which is a visible sermon for the benefit of the observing miner, if he will only profit by the instruction which it is their province to exhibit.

No man works harder than the miner; no man strives more earnestly to obtain profitable results from his labors than does the miner; no man undergoes more privations than the miner; and no class of men meet with such general and continuous failures as the mining men. In the general rule, those among them who are successful are not so from the exercise of caution and scrutiny, but simply because they have blundered or stumbled upon fortunate locations. With failures being the rule and success the exception, there certainly must be an underlying cause for such an untoward condition. We think we have set forth the leading causes that have produced such results.

The preventive course against the continuance of the evil is for the prospector and subsequent workers of a location to be cautious and cool in their preliminary examinations. Look well to the character of the adjacent ground. Study carefully the indications which the lode presents. Ascertain if the rock is truly metalliferous or merely spotted with ore. Attention should be given to the availability of timber and surface water; to the accessibility of the mine to water communication, railroad, or common transportation; and to the possibility of decreasing the cost of getting the working materials to the mine, and getting its products to the great centers of trade.

A close and accurate account should be kept of all expenditures, which, if classified into the various departments of the work on the mine, would be still better; and also of the yield of the mine. It would be a simple matter to strike the balance, and ascertain if the adventure was profitable or not. It would give an opportunity by referring back to these items occasionally to find where some portion of the expense might be avoided in the future by more judicious purchases, or by not buying again similar articles which were not actually requisite.

Efficient and capable superintendents should be employed. They should be men who have had experience in working mines, who possess the executive ability to manage the men in their employ, and the mining knowledge needed to solve practically the difficulties that so frequently confront the man in their labors. They should be cool and brave on all occasions, for the lives of the men might be jeopardized were they not so, or the loss of a shaft, tunnel or level might entail a heavy expense, from heated or precipitate action on their part. The men should be governed firmly, without harshness, resolutely but kindly, and with a due regard to equity. They should be made to faithfully perform the work before them, and should be promptly paid at stated times the full amount of their wages then due.

As was stated at the commencement of this article, mining should be conducted upon strictly business principles, to ensure success. When the mines on this coast are managed in accordance with these principles, we will see the mining interests assuming their proper sphere, and mining itself be elevated above the great uncertainty that now surrounds it. Then a justly confiding public will sustain and support mining operations, and investments in them will be considered as wisely made and as safe as those which appertain to other channels of industry.

S. P. L.

VIEW OF EHRENBERG, ARIZONA.—INDIANS AT PLAY.

A Single Track Railway.—A movement is now on foot to give a practical test of the James single track railway system, by building a mile of road back of Antioch, Contra Costa county. The money has been subscribed to defray the expenses of the experimental trials, and a meeting will be held within a few days at Antioch to determine the precise locality for building the mile. The locomotive drawings of which we have seen, will, in all probability, be built by the Union Iron Works in this city. An engine of a capacity of hauling 300 tons can, it is estimated, be built for a little over $2,000. It is also estimated that freight can be carried from Mussel Slough to Antioch, a distance of 180 miles, for $2.50 per ton, whereas it now costs more than $6. It is thought the cost of building the road will not exceed $1,200 per mile. If the experimental trials are satisfactory, efforts will be made to construct the road down through the valley to Mussel Slough. Active efforts are now being made to carry the project through.

In New York, Government bonds are quoted at 102½ for 4s of 1907; 103½ for 5s of 1881; 105⅝ for 4½s; sterling, $4.82@4.84; silver bars, 113; silver coin, ½@1 discount.

New Metallurgical Works.

A want has long been felt in this city for some place where working tests of ore could be made by any desired process. People frequently want small batches of ore practically worked in the way it is to be on a large scale, but there has been no place to do this where all the various appliances were provided. Messrs. Kustel & Riotto have now, however, established metallurgical works at No. 318 Pine street, where ores are crushed and sampled, and working tests made by any process. Assaying and analysis in all its branches is practiced, and metallurgy of gold and silver taught theoretically and practically.

At this place the necessary mill process can be exactly carried out. There is first a little Blake rock crusher for breaking the rock, and one of Kendall's ore stamp mills for crushing it. This little stamp works admirably, and as any size screen can be used, the work of a large mill can be done on a small scale. In front of it are the amalgamating plates and sluices, and there are also pans and settlers for use in connection with the mill. A wooden pan is also provided, and the ore may be crushed, wet or dry.

Leaching tubs and vats are arranged for chloriuation or lixiviation processes, with all the necessary appliances. They have a roasting furnace, a smelting furnace, assay and cupelling furnace, a refining furnace, and all the manipulation of ores requiring fire may be tried. There are also ore scales, assay and bullion balances, a complete chemical laboratory, retorts of different sizes, arrangements for testing small samples of ore by pan or horn spoon, and, in short, all the appliances for testing or working ore in any desirable manner, and on a scale which furnishes a complete practical working test for any kind of ore. The furnaces are all arranged so that the fumes are carried away readily. In the rear is a large sampling floor where the process of sampling ores may be carried on. If desired, any of the processes may be carried on in the presence of the interested parties. Tests for the proper process for any ore may be made with facility when all the various appliances are so ready at hand.

Mr. Guido Kustel is a miner and metallurgist of life-long experience, and has been on the coast for 25 years engaged in business connected with the mining interests. He is the author of several well known mining works and has had large experience with the various processes. Mr. E. N. Riotte has also been engaged for many years in mining pursuits, and bears an equally good reputation as an expert assayer and metallurgist. Mr. H. Kustel has been associated with his father for several years in the same class of business. These gentlemen are practical men, thoroughly conversant with the various processes for treating ores, and competent to undertake any sort of work in this line. With so complete an establishment as they now have in every respect, miners may have batches of ore properly worked by any process and rely upon the results as being correct.

Ehrenberg, Arizona.

We offer our readers on this page a cut of the town of Ehrenberg, Arizona, taken from the Continent Stereoscopic Company's work, "Picturesque Arizona." The view looks up the Colorado river, on the left, the California side, covered with a dense cluster of willows, greasewood and small timber. At the time the drawing was made the town of Ehrenberg was a unique settlement, composed mainly of Mexican or Indian huts, but has undoubtedly improved its appearance since 1877. The soil is very fertile, and must attract the attention of those interested in the development of the country through its agricultural features. It is difficult to conceive a correct idea of Arizona as a whole, so vast its extent, so varied its resources, and so wonderful its features, that the mind naturally selects some single attractive feature to the exclusion of all the rest. The contrasts of the Territory are immensely striking, and beget a beauty, the interest in which grows constantly.

For general and prolific productiveness the more southerly portions of Arizona probably excel; the wonderful must be accredited to the northern part, while along that peculiar river, the Colorado, the charm of mystery hangs like a cloud, which Indian traditions have generated, and it seems a pity to dispel it by the light of modern development.

Subterranean Ebb and Flow.—There are coal mines in Germany in which the phenomenon of subterranean waters having a regular ebb and flow has been observed. The scientific academies of Vienna and Berlin are studying it, and look for valuable additions to our knowledge of the earth's interior.

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THE MINING AND SCIENTIFIC PRESS PATENT AGENCY was established in 1860—the first west of the Rocky Mountains. It has kept step with the rapid march of mechanical improvements. The records in its archives, its constantly increasing library, the accumulation of information of special importance to our home inventors, and the experience of its proprietors in an extensive and long continued personal practice in patent business, affords them combined advantages greater than any other agents can possibly offer to Pacific Coast inventors. Circulars of advice, free.

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This invention meets a want which has long been felt by Gravel Miners and Millmen, viz.: that of a simple, cheap Riffle which will save the largest possible amount of gold or sulphurets, with the least possible waste of quicksilver. That this Riffle answers all these conditions will be apparent to any practical man who takes the trouble to examine it. The arrangement of this Riffle is such that there is a strong, unobstructed upper-current to carry off and break up the gravel or cement, and a slow under-current, checked by numerous riffles, which give gold or sulphurets a better opportunity of settling than if they were exposed to the force of the main current.

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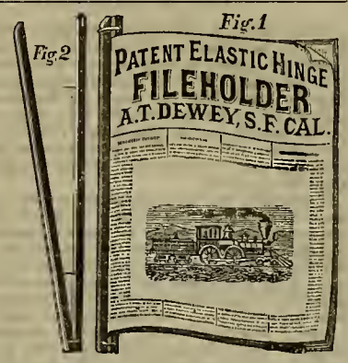

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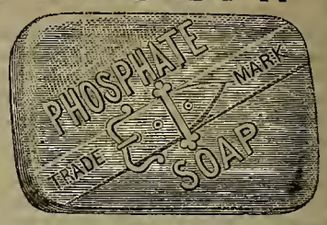

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If your wife is in the habit of using cosmetics of any kind, advise her to give up the pernicious practice, as the most harmless face powders obstruct the pores of the skin and sooner or later injure the complexion, while PHOSPHATE SOAP removes all impurities and assists nature in developing a natural, healthy and beautiful skin.

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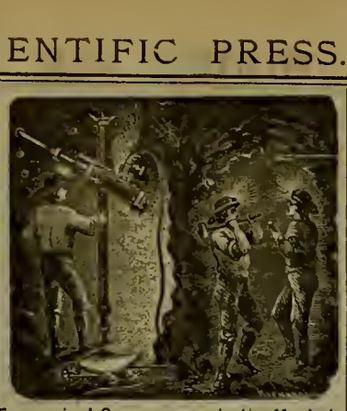

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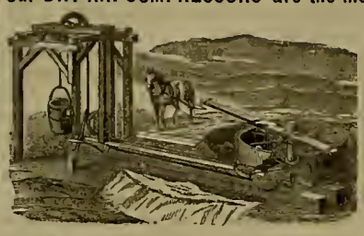

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The Power is mainly built of wrought iron, and cannot be affected by exposure. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending bucket. The frame of the Power is bolted to bed-timbers, thus avoiding all frame work. When required these Powers are made in sections for packing.

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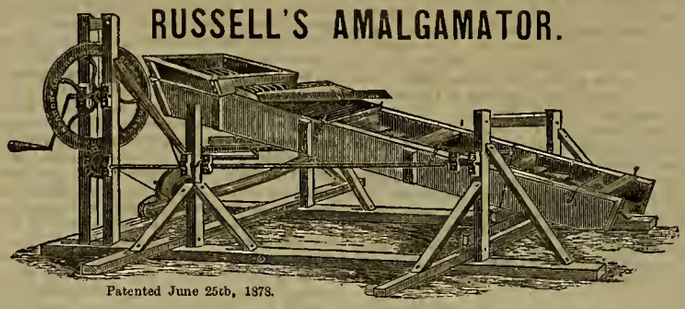

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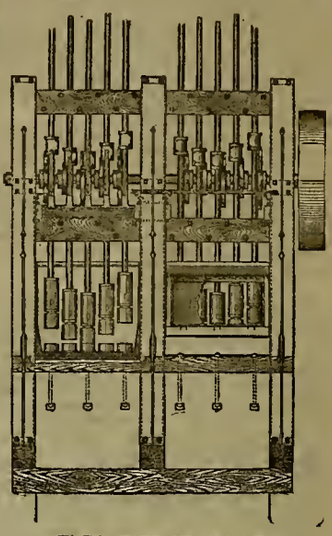

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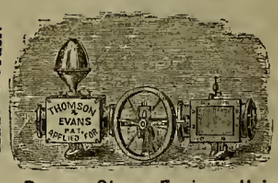

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[CONTINUED FROM PAGE 245.]

Boston, Massachusetts, interested in some of the claims and they have advanced the capital to work them.

PIOCHE DISTRICT.

RAYMOND & ELY.—*Record*, Oct. 11: H. Mill, Sup't, in his report of Oct. 10, says: We are sinking on the 10th in a big body of ore; ledge looks well and is from 8 to 10 ft wide, and everything indicates an enlargement of the ore-body. The 11th is still holding out and next month we expect to take out a good deal of ore The west drift on 11th still in good ore and prospects are we will have big body. We sent to mill this week 170 tons of ore. General prospect of mine looks well.

TEM PAHUTE DISTRICT.

INCA MINE.—A Chicago party says: A shaft has been sunk 350 ft, and valuable ore taken out. The ledge is from 4½ to 5 ft in width, and the ore, according to the reports of reliable experts, will average from $250 to $300 per ton in silver. Some of the ore specimens will assay as high as $12,000 per ton. Shipments of ore have been made to the Reveille mill, a distance of 65 miles from the Inca, which have turned out as follows: First grade ore, $750 to the ton; second-class, $425 per ton, and third class, $270 per ton. Cost of working ore is estimated at $12 per ton.

REVEILLE DISTRICT.

GILA MINE.—Tybo *Sun*, Oct. 11: Letter of the 29th says: During the past week the south drift from south drift winze No. 2 was driven 4 ft. In it we have struck a wide vein of good ore and one that promises to yield a large quantity. An average assay of the vein has not yet been made, but an assay of $236 32 per ton has been had from a selected piece. The stope in south drift winze is looking well and yielding about 6 tons per day. At the mill we now have 130 tons of ore. It is proposed to start a drift on the 200 level, and strike the continuation of the old ore body worked in 1875, which is probably within 100 ft.

ARIZONA.

PIMA COUNTY.—The *Territorial Expositor* says: A private letter received from Tombstone, Pima county, gives good news from that camp. The mines are turning out large quantities of silver bullion, and all interested in the new town of Tombstone are confident that it will be a large, permanent and prosperous place. Mr. Larry, who went to Tombstone from this place several weeks ago, purchased two lots for $800, and in a few hours afterwards could have sold them for $1,200. Forty houses are at present in course of construction, and many more buildings would be commenced were it possible to procure lumber. At present the labor market is overdone, and there are hundreds of unemployed men in the district.

ITEMS.—Prescott *Arizonan*: Mr. G. Pourier informs us that the miners working the assessment of Messrs. Moeller & Rush, in Big Bug district, uncovered a new ledge, two and one-half ft wide, which gives assays in silver, per ton, as follows: Green ore, $1,162.44; red, $2.08; black, $3. We learn that Capt. James A. Moore struck an ore vein of 40 ft in the Globe district, after running a tunnel 430 ft, at a cost of $15,000. Samples of all grades of rock, divided into three classes, assayed as follows, per ton: Lot No. 1, 690 ounces; lot No. 2, 473 35-100 ounces; lot No. 3, 53 46-100 ounces.

COLORADO.

BIG HORN.—Telegram from Fort McKinney says: Great excitement prevails in this vicinity, on account of recent rich discoveries of gold-bearing quartz in Big Horn mountains, about 75 miles northwest of this post, at the head of Tongue river. Large numbers of miners are passing through this place en route to the mines. Nearly all the citizens of this section are leaving for the mountains. Ore has been assayed with the following results: Lowest, $4; highest, $70 per ton.

BOULDER COUNTY.—The *News and Courier* has seen a mill run with ore from the Poor Man's Relief mine which showed net returns of $602.12 gold and $37.92 silver per ton. The Grand Central, adjoining the Atom mine, disposed of a mill run on 442 pounds for $144.07. Another shipment of 133 pounds yielded $517.47 net. These two mines are four miles from Boulder in the Gold Cliff camp.

PARK COUNTY ITEMS.—The Fairplay *Flume* notes a new mining location at Montgomery. The vein is a very strong and well defined one. Two ft of the vein matter contains a large amount of copper, and an average assay of this two ft yields one and seven-tenths of gold and eight ounces of silver. A body of white iron forms the balance of the vein matter. It runs an ounce in gold and several ounces in silver. A late assay of ore from the Truman mine, on Mosquito, showed a coin value of $4,000 per ton, and a ton of mineral on the dump awaiting shipment. Some ore from the Bonanza King extension contained upward of 30% of nickel, besides $60 to the ton in gold and silver. A new discovery made by Robert Lampkin, on Buckskin gulch, shows a fine body of mineral. The quantity of black sulphurets which this ore carries makes it a high-grade mineral. One sack which was tested at the mill ran at the rate of 260 ounces to the ton. Beautiful specimens of native silver were taken from the crevice, which led to the report published in the Denver *Tribune*, that there was a three-inch vein of metallic silver.

MONTANA.

NEW QUARTZ LODE.—The Butte *Miner* says: Messrs. W. L. Lee, Morgan Davis and R. K. Emerson, who discovered gold-bearing quartz in the foothills, on the southeast side of the Park, at a distance of about eight miles from this city, have sunk a shaft 26 ft deep, and taken out about 20 tons of ore. They commenced working an arastra on Monday last, by horse power. The first clean-up will take place two weeks hence. An assay made a short time ago, showed $49.60 to the ton. The operators say the prospect becomes better as they go down.

MADISON COUNTY.—Parties from the Potosi district bring information of the erection of arastras and the opening of now roads in that district. There are some very promising lodes, and a Mr. Hathaway brought in some ore from the Birdseye and Carrie Hathaway No. 2 lodes, which were tested by Assayer S. B. Rice, and found to assay 304 ounces per ton for the Birdseye rock, and 1,052 ounces per ton for that from the Carrie Hathaway No. 2. It is his intention to take a quantity of the latter ore to the Butte smelter, as soon as he can get it out—which will be in a few days.

BUTTE.—A writer in the Idaho *Statesman* says: The operators in the Alice mine expect to strike rich silver-bearing quartz in a few days. It is the same vein that has already been worked. The extension of the shaft is now to about 500 ft, and the workmen are drifting towards the vein. Experts say this camp is destined to become one of the most lively and richest in the world. Z. L. White, of the New York *Tribune*, has been thoroughly investigating as to the outlook, and progressing operations, and says Butte seems to be richer in silver than the Black Hills are. He thinks that this is destined to become a great camp.

UTAH.

BINGHAM MINES.—A correspondent of the Salt Lake *Tribune* says: Each day that passes brings intelligence of some new discovery being made in the gold line, which brings forth the oft-repeated opinon among our miners, that Bingham, as a gold-producing camp, is only in her infancy. The different theories that have been advanced regarding the placer mines of this place are fast becoming exploded. As gold mines in Carr Fork, gold mines in Highland, and gold mines in Bear Gulch demonstrate to a certainty, that the action of the weather on the exposed body of quartz caused decomposition to free the shining metal from the molten rock, and when thus freed was carried by the water and deposited in the canyon below, hence the auriferous gravel formed. Among the latest gold discoveries is the one made in the recent developments of the Starless mine. One pan of rock crushed in a mortar was tried, and $1.25 was found to be the result of the experiment.

WASHINGTON.

SKAGIT MINES.—By telegraph, from Seattle, we learn that N. E. Goodell arrived there October 8th, bringing eighteen ounces of coarse drift gold from the Skagit mines. He states that there are now thirty men in the diggings on Ruby creek, who recently struck it rich, and are taking out from $5 to $12 per day to the man. The mines were discovered last fall by a prospector named Rawley, who took $70 in drift gold from a pocket on Ruby creek in a few hours. The news reaching this city and other Sound ports, a rush set in for the mines. Taking it for granted that gold existed in paying quantities in the bed of the creek, some sixty men have been at work all summer constructing ditches for the purpose of draining it. The bedrock, however, was found smooth and clean, with no traces of gold upon its surface. Disgusted with the summer's work, the men began to pack up and leave for home. On their way out, about two weeks ago, a remnant of the force, some 30 in number, camped on the forks of the creek over night, six miles below the scene of their summer's work. Upon leaving next morning, traces of gold were discovered along the banks of the stream. Upon these indications the men went to work, and soon took out over an ounce of gold. Since then, the party have taken out some 35 ounces, although a considerable portion of the force have been engaged during the time in packing in provisions a distance of 35 miles, and not engaged in actual digging. Flattering prospects have since been found at several points along Ruby and Canyon creeks.

Bingham Canyon, Utah.

S. R. Dickeon, writing from Bingham, Utah, to a late number of the Salt Lake *Tribune*, says that since lead has advanced in price, new life has been infused into the above mining camp. The old mines are being carefully examined and new ones located, in search of smelting ores, or for ores which contain lead, 15% and upwards, in combination with gold and silver. With three or four exceptions, this quality of ore is mined by individuals, most of whom are much limited in means and generally work-leased property. Consequently the output of mineral is limited and uncertain. In the early history of this district, all mining operations were conducted with the single reference of obtaining ores of this description; and ores containing as high as 40 ounces of silver and $5 in gold, if deficient in lead, were either thrown over the dump with the waste or left in the mine. This anomalous condition in mining is the result of circumstances in which this camp is now and has always been placed. The only means which were then and are now adopted for the reduction of the ores produced, are the smelting furnaces and they are situated upon the Jordan river, about 16 to 18 miles from the mines. The excessive charges for transportation and cost of reduction, made the mining of all ores, containing less than 30% of lead and 15 ounces of silver unprofitable; and at this day, ores of this grade must be free from sulphur to find purchasers for them.

Within the last two years large developments have been made of ore free of lead, but containing gold and silver in a free state, and in such quantities as to make the business of their mining and reduction a source of great profit. The gold and silver of these ores are in combination with iron, which originally was pyrites, but by the action of air and water, the iron has been deprived of its sulphur, and by the absorption of oxygen has been converted into a per-oxide of soft hematite, thus leaving the gold and silver in a chemical condition suitable for amalgamation and cheap milling.

This ore is found in large veins, or, perhaps (in some cases) more properly speaking, deposits, varying in thickness from three to thirty feet, of ore proper, free from gangue and can, in most cases, be mined and milled for less than $2.50 per ton, and as there exists no question as to the extent and permanence of the mineral veins, the formations being well defined and regular, exhibiting no indications of such disturbance as is likely to produce slips and dislocations of the vein matter, and as the mineral lodes generally conform to the rock stratification, the conclusions are strong that the mineral veins will extend to a great depth, and that their quality and quantity will proportionately improve; neither is there any indications that in this district the miner will experience an increase of temperature as the mines are worked down, such as is founded in the Comstock, the geology of the country not justifying such apprehensions.

The mineral character of the veins is properly described, as first, silver veins, which upon their surface, or outcrop, carry lead, silver and gold, and are worked for smelting ores, the lead disappearing a few feet below the surface, but the gold and silver associated with iron continuing downwards, where the ore becomes a milling or amalgamating ore. Second, an ore which from the surface contains gold and silver in such a state of combination with iron, as to render its reduction by amalgamation less expensive than any other known process; hence such ores are called gold ores.

Many of the old mines, formerly worked for smelting ores, and of such apparently exhausted, are found to be valuable for the milling ores which they contain, and there exist strong indications that many of these old mines, when carefully prospected, will be found of much greater value, for the production of this quality of ore, than they have ever been for the production of smelting ores.

The value of the milling ores ranges from $10 to $150 per ton, the lower grade consisting almost wholly of gold, while the higher may properly be called silver ore containing gold, but the relative value of milling ore is by no means dependent wholly upon the amount of gold and silver which they contain. There are many contingencies which so qualify mining and milling operations that it is not unfrequently we see a low grade ore worked with profit, while work upon high grade ores are found financially disastrous. The value of the milling ores of Bingham consists in the magnitude of the veins and deposits and the cheapness with which they can be mined and milled.

The Railroad Commission.

Many people are now waiting with anxiety, and many more with deep interest, to see what will be the effect of the work of the Railroad Commission elected under the new Constitution. It is a matter which will have a marked influence upon our producing interests, and upon wise and just action on the part of the commission will measurably depend the degree of prosperity which certain regions of our State will attain. While we are thus waiting it is well to expect that the commission will wisely and honestly discharge the high trust placed in it, and it is well also to borrow such assurance as seems warranted by the experience of other countries which have vested high power in similar bodies of men.

The last issue of the *North American Review* contains an article on the "railroad problem," in which especial reference is made to the English railroad commission, the nature of its powers and the results therefrom. From this account we draw certain statements which will be interesting and comforting during our period of expectancy. The English railway commission was organized by an Act of Parliament in 1873, and consists of three persons and two assistants. Of the three commissioners one was skilled in law, and one in railroading; and no member was allowed to have any pecuniary interest in any railway or canal company. The commission was authorized to receive all complaints of discrimination, etc., and they were invested with all authority formerly reposed in the courts, which ceased to exercise jurisdiction in railway matters except to enforce the decisions of the commissioners. This commission has power to fix all apportionment of rates for through freight to the several lines participating in the carriage. Municipal or other public corporations could lodge complaints of discrimination without proving that they were aggrieved, as investigation into the fact devolved upon the commission. The companies were required to keep a list of special and schedule rates in a place of public access, and to furnish any required information regarding their business. Access by the general public to these schedule and rate lists has proved a good provision, as well as that making any individual or corporation an informant in charges of violations. The first duty of the commissioners was to simplify the methods of procedure on applications, dispensing with certain forms and placing a company on its defense without delay. The railway and canal companies were not permitted to consolidate without the commissioners' consent and only after the terms of agreement had been thoroughly published. These were among the reforms established during the first year of the English railway commission.

"During the second year the commissioners were called upon principally to decide upon questions of discriminations on the part of railway companies between customers. Rates were proved to have been charged higher and lower than those fixed by the schedules, and the scheduled rates were restored. Abatements in charges to persons agreeing to patronize a certain company were discovered on complaint and stopped. Rebates for terminal service performed by customers were stopped on complaint of parties at a corresponding station where an opportunity did not offer for the performance of similar service. A number of cases of disagreement in reference to through rates and routes were submitted to the commissioners and equitably adjusted. In one or two cases the jurisdiction of the commissioners was contested, but, this being decided in their favor, the question at issue was privately arranged. There were no appeals allowed from the decisions of the commissioners, inasmuch as the exceptions were not based on questions of law."

These few items of reform in railway management which we have outlined must be regarded as of the greatest importance in the way of securing impartial public service from the companies, and this coupled with a reduction of rates to a fair compensation for the work done is all the public desires from its carriers. That the English commission has thus far succeeded in its work during the few years it has been in power is certainly a warrant that we may expect similar benefits from a similar organization. We trust that the commission which will soon come into power in this State will be characterized by a disinterested and unhesitating enforcement of right and justice between the companies and our municipalities and individuals, for thus and thus only can the men chosen at the last election show themselves worthy of the trust committed to them by the people.

NEW TYPE WRITER.—A new type writer consists in the combination, with a finger lever and platen or roller for the paper, of a type bar, having its pivotal point and its point of connection for the connecting rod which connects the type bar with the finger lever arranged so that when the points are brought in a direct line with each other, the type will clear the roller at a convenient distance from it.

THE strike of colliers at Charleroi, in Belgium, which commenced a few days ago, is extending and assuming a threatening aspect.

News in Brief.

SIGNS of rain.

WEATHER very hot in New York.

THE Colorado Indian war is ended.

BRITISH forces have entered Cabul.

THE walking craze has become epidemic.

LAND troubles in Ireland. Tenants refuse to pay rent.

HENRY C. CAREY, the writer on political economy, is dead.

THE United States Supreme Court is now in session at Washington.

SNOW and hail prevailed in portions of British Columbia Sunday.

THE Panama Railroad Company has declared a dividend of four per cent.

SPECIE in the Bank of Germany decreased 13,829,000 marks last week.

THE Bank of Belgium has raised its rate of discount from 2½ to 3½ per cent.

THERE are 12,000 tons of wheat at Walla Walla, W. T., awaiting shipment.

THE storm of last Saturday was quite general, and but little damage was done.

A DEFENSIVE treaty is said to have been concluded between Germany and Austria.

GREAT preparations are being made at Sacramento for the reception of General Grant.

GRAND Lodge of Good Templars for Nevada and Utah convened at Carson October 14th.

ADVICES from Montevideo state that the Cabinet has resigned and a new Ministry formed.

THE loss of the Afghans in the fight before Cabul on the 6th instant is stated at 400 killed.

SILVER in London, 52d; consols, 97 11-16; 5% United States bonds, 106⅝; 4s, 105⅝; 4½s, 109½.

YELLOW fever has recommenced in Memphis and has also appeared in Arkansas and Louisiana.

EIGHT hundred railroad employees are on a strike at Cleveland, Ohio, for an advance of wages.

EIGHT hundred barrels of potatoes were shipped a few days ago from St. John, N. B., to England.

IT is proposed to consolidate the St. Louis, Kansas City and Northern Railroad with the Wabash.

TWELVE new cases of yellow fever were reported at Memphis Saturday, and five deaths occurred.

ACTIVE opposition to the employment of Chinese in railroad building prevails in British Columbia.

CONVENTION of Italian Benevolent Societies of the United States now in session at Louisville, Ky.

CALIFORNIA State Grange adjourned *sine die* at Oakland last Saturday. Important questions were discussed.

THE amount of public land taken by actual settlers during the late fiscal year was nearly 1,500,000 acres.

A SHIPMENT of 100,000 pounds of Arizona wheat was made lately from Maricopa, consigned to Liverpool.

RUSSIA is willing that Cabul shall be destroyed, but will not allow of the annexation of Afghanistan by England.

RUSSIA has demanded reparation from Turkey within twenty-four hours for insults to the Russian Consul General at Salonica.

THE Great Council of Geneva, Switzerland, has adjourned consideration of the separation of Church and State until May.

MEASURES to abolish slavery in Cuba is causing a crisis in the Spanish Cabinet. Ten thousand more soldiers are sent to Cuba.

THE London *Daily News* says: If gold continues to leave England and France as it has lately, it will soon become necessary to consider measures to stop the outflow. [This money comes to pay for American produce, to stop it would be repudiation.]

THE New York *Commercial Bulletin* correspondent declares, after an extended trip through the State, that the transportation question is a leading issue with the people in the interior. Oppressive railroad freight discriminations, as brought out by the Legislative investigation, has astounded the general public. If legislative remedies are prevented during the coming winter, it will not be the fault of the people, but it will rest solely with the dictatorial caucus-nominating system.

CROFUTT'S TOURIST GUIDE.—The annual revised editions of *Crofutt's New Overland Tourist and Pacific Coast Guide* will, hereafter, be issued on the 15th of January. The new books will contain new and important matter, embracing all the points of interest on the line of the Union and Central Pacific Railroad, but also those along 38 connecting railroads, with the adjacent country, mines, agriculture and stock-raising advantages. The work will be profusely illustrated. There is hardly a work which contains so much important and interesting matter as this little book which has, perhaps, been the means of directing many to localities where success has attended them. The publishers, the *Overland Publishing Co.*, of Chicago, Ill., are adding a *new department*, which contemplates the delivery of a series of *descriptive lectures* in this and foreign countries. The views will be on glass, appropriately colored and enormously enlarged. This department is intended to attract foreign attention, and aid in the general prosperity of all. We wish success to the enterprise, and hope to participate in the general benefits. Mr. Crofutt will arrive in this city at an early day to carry out the contemplated programme.

Patents and Inventions.

List of U. S. Patents Issued to Pacific Coast Inventors.

[From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

For the Week Ending October 7th, 1879.

220,212.—Water Wheel—D. H. Anderson, S. F.
220,337.—Lime and Cement Kiln—C. Brown, Mare Island, Cal.
220,271.—Fire-Arm—J. M. Browning, Ogden City, Utah.
220,222.—Safety Device for Elevators—James H. Culver, S. F.
220,365.—Steam Farming Apparatus—Wm. H. Foye, San Francisco.
220,366.—Combined Steam Harvester and Thresher—Wm. H. Foye, S. F.
220,367.—Double-Acting Reversible Gang Plow—Wm. H. Foye, S. F.
220,283.—Automatic Grip for Rope Railways—Henry S. Grace, S. F.
220,289—Machine for Seaming Cans—Robert D. Hume, San Francisco.
220,387.—Ventilating Apparatus for Mines—J. Kay and S. Rockfeller, Bodie, Cal.
220,246.—Rotary Engine—B. E. Letang, San Leandro.
220,408.—Windlass and Derrick for Wells—Benj. F. Mull, Merced, Cal.
220,304.—Explosive Compound—John Pattison, Nevada City, Cal.
220,454.—Honey Extractor—G. W. Williams, San Diego, Cal.
220,326.—Toe-Weight for Horses—Wm. Zartman, Petaluma, Cal.
220,299.—Planing Machine—J. W. Metcalf, San Jose.
220,325.—Spring Gun—R. Wylie, Napa, Cal.
7,716.—Whisky—Trademark—E. Chiclovich, S. F.

Note.—Copies of U. S. and Foreign Patents furnished by Dewey & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s Scientific Press American and Foreign Patent Agency, the following are worthy of special mention:

Machinery for Reducing Old Steel Railroad Rails to Merchantable Bars.—Burroughs P. Brunner, S. F. No. 219,616. Dated Sept. 16th, 1879. In the working of steel it is of the highest importance that any disturbance of the fibers of the metal shall take place equally throughout the mass. If an unequal disturbance of the fibers occurs, it leaves the metal in a condition of unequal tension highly detrimental to its subsequent manufacture. Heretofore, in rerolling and reducing steel railway rails, it has been customary to split the web of the rail at one pass through a cutter, in order to prepare the pieces for the subsequent action of reducing rollers. The web being comparatively thin, there is a necessary amount of drawing of the web of the rail incident to the impact of the knives on the web, and this drawing, without any corresponding drawing of the flange and head, leaves the fibers of the metal in the web elongated in relation to the fibers in the head and flange. This unequal tension or condition of the fiber, when once produced, is impossible to eradicate by any subsequent rolling or working, and is a great drawback to the utilization of the steel. The object of Mr. Brunner is to overcome this difficulty and provide a means whereby worn-out steel rails may be rerolled into merchantable bar or other steel in a cheap and convenient manner; and the invention consists in rollers having grooves or passes, one of which is provided with a cutter or cutters, this groove or pass provided with a cutter being designed and operated simultaneously to split the rail along the line of the web and compass and draw out the head and flange portion of the rail, the other grooves or passes operating subsequently to reduce the head or flange sections to merchantable bars of the form desired.

Ventilating Apparatus for Mines.—Joel Kay and Simon Rockefeller, Bodie, Mono Co., Cal. No. 220,387. Dated Oct. 7th, 1879. This invention relates to certain improvements in apparatus for ventilating mines, tunnels and other excavations or chambers in which foul air, gases or vapors are liable to accumulate; and it consists in the employment of a steam boiler, into the chimney or stack of which a pipe or tube is led from the point which is to be ventilated. This pipe turns upward within the stack, and a steam pipe is led from the boiler into the pipe, discharging toward or up the chimney or stack, so as to create a draft which will draw the air or gases through the tube, and discharge it to be carried out by the draft in the chimney or stack. By this apparatus the ventilation may be more readily and thoroughly secured than by any device now in use.

Extension Ladder.—Oscar Marshal, Stockton, Cal. No. 219,749. Dated Sept. 16th, 1879. This invention relates to certain improvements in the method of operating extension or other ladders, derrick masts, and other apparatus which it is necessary to frequently raise and lower; and it consists in a novel combination of drums or rollers, and a movable fulcrum mounted upon a suitable frame-work, so that the ropes from these drums act consecutively upon the ladders, the first drum acting to raise the ladder or mast to a certain position, and the second one completing its elevation, after which the apparatus is set to any desired incline or position by the aid of the two.

Windlass and Derrick for Boring Artesian Wells.—Benjamin F. Mull, Merced, Cal. No. 220,408. Dated October 7th, 1879. This invention relates to an improved windlass and derrick for artesian well-boring, and consists: First, in a novel construction of the windlass, so that it may be worked by hand or horse, or steam power, and by which it may be worked by cog or friction gearing for more or less speed, as desired. Second, in forming the derrick of light sections of boiler-iron connected together in a peculiar manner, by which means he is enabled to form a light, high derrick which may be easily separated in sections, so as to be transported from place to place without difficulty.

Spring Guns.—Richard Wylie, Napa, Cal. No. 220,325. Dated Oct. 7th, 1879. This device relates to an apparatus for throwing missiles, projectiles or arrows; and it consists of a gun having a barrel, suitably connected with a stock and having a slot in its lower part. A driving-block for the arrow or projectile moves in the barrel, and has a stem projecting down through the slot, so as to have the firing elastic straps attached to it. These straps are contained in a chamber beneath the barrel, and have one end secured at the front, so that their tension may be regulated. The weapon may be properly sighted, and is very accurate.

Planing and Matching Machine.—John W. Metcalf, San Jose, Cal. No. 220,299. Dated, Oct. 7th. This invention relates to an improvement in wood-working machinery, and it appertains particularly to that class of machines wherein by the passing of a board through a planing machine to divide it longitudinally into two boards, each of the two are planed on both sides, and each tongued on one edge and grooved on the other, so as to form matched stuff, which may be headed at the same time; and the invention further consists in alternating the planing and the grooving knives on the same shaft.

Self-Fastening Toe-Weight.—Wm. Zartman, Petaluma, Cal. No. 220,326. Dated, Oct. 7th, 1879. This invention relates to an improved toe-weight for horses, and consists in a peculiar construction of the spur or clip and weight, by which the weight is firmly secured to the shoe without the necessity of using any bolts, screws, or straps to keep it in position, so that the weight is made self-fastening.

Back Numbers Wanted.

The following volumes and single copies of the Mining and Scientific Press are wanted at this office, for which a reasonable price is offered:

Year.	Volume.	
1870	20	2 Complete volumes, 1st half (of year).
1870	20	2 Copies of No. 2, Jan. 1st.
1870	20	1 Copy each of No. 1, Jan 1st, 3 of Jan. 14th, 7 Feb. 11th, 6 Feb. 4th.
1870	21	1 Copy of No. 7, August 13th.
1871	22	5 Copies of No. 1, Jan. 7th.
1871	22	3 Copies of No. 5, Feb. 4th.
1871	22	1 Copy of No. 3, Jan. 21st, 6 of Feb. 2d, and 1 of May 1st.
1871	23	1 Copy of No. 2, July 15th, and 9 Sept. 2d.
1872	24	2 Copies of No. 4, Jan. 27th.
1872	24	3 Copies of No. 7, Feb. 17th.
1872	24	2 Copies of No. 17, April 27th.
1872	25	1 Copy of No. 10.
1872	25	1 Complete volume, last half (of year).
1873	28	3 Copies of No. 8, Feb. 22d.
1873	28	3 Copies of No. 9, March 1st.
1873	28	2 Copies of No. 10, March 8th.
1873	28	1 Copy of No. 7, Feb. 15th.
1873	27	3 Copies of No. 20, Nov. 15th.
1873	27	4 Copies of No. 21, Nov. 22d.
1873	27	3 Copies of No. 24, Dec. 13th.
1875	30	1 Copy of No. 4, Jan. 23rd.
1875	30	1 Copy of No. 5, Jan. 30th.
1875	30	1 Copy of No. 8, Feb. 20th.

OUR AGENTS.

Our Friends can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. L. Tharp—San Francisco.
B. W. Crowell—California.
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G. W. McCrew.—Santa Clara county.
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Fresh attractions are constantly added to Woodward's Gardens, among which is Prof. Cruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

How to Stop this Paper.—It is not a herculean task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

Sample Copies.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

Extra Copies can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

Experimental Machinery, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. See ad. F. W. Fuller, 415 Market St., second floor, S. F.

Chew Jackson's Best Sweet Navy Tobacco

GENERAL MERCHANDISE.

[WHOLESALE.]
Wednesday m., October 15, 1879.

CANDLES.
Crystal Wax..........17 @—
Eagle..........12 @—
Patent Sperm.......... 30@—

CANNED GOODS.
Assorted Pie Fruits,
2½ lb cans..........2 25 @ —
Table do..........3 50 @ —
Jams and Jellies..3 75 @ —
Pickles, hf gal.....3 25 @ —
Sardines, qr box..1 67½@1 90
Hf Boxes.......2 50 @2 75
Merry, Faull & Co.'s.
Preserved Beef,
2 lb. doz..........3 75 @4 00
do Beef, 4 lb.doz.5 50 @ —
Preserved Mutton,
2 lb. doz..........3 75 @ —
Beef Tongue.. ...5 50 @ —
Preserved Ham,
2 lb. doz..........6 50 @ —
Deviled Ham, 1 lb. doz..........5 50 @ —
do Ham, ½lb doz.3 00 @ —
Boneless Pigs Feet,
3 lbs..........4 50 @ —
2 lbs..........3 75 @ —
Spiced Fillets,
2 lbs..........4 25 @ —
Head Cheese,
3 lbs..........4 25 @ —

COAL—Jobbing.
Australian, ton.. 6 00 @ 6 50
Coos Bay........ — @ 5 50
Bellingham Bay. — @— —
Seattle..........5 50 @ 8 00
Cumberland.....12 00 @15 00
Mt Diablo...... 4 76 @ 6 00
Lehigh..........11 50 @12 50
Liverpool....... 6 00 @ 6 50
West Hartley... — @ 8 00
Scotch.......... — @ 8 00
Scranton........ — @— —
Vancouver Id... 6 00 @— —
Charcoal, sack.. 75 @— —
Coke, bush...... 60 @— —

COFFEE.
Sandwich Id, lb. — @— —
Costa Rica...... 16 @ 16½
Guatemala...... 16 @ 16½
Java.......... 25 @— 26
Manila.......... 17 @— —
Ground, in cs... 25 @— —

FISH.
Sac'to Dry Cod.. — @ 4
do in cases.. 5 @ 6
Eastern Cod....— 7 @— 7½
Salmon, bbls.... 8 00 @ 9 00
Hf bbls....... 5 00 @ 5 50
1 lb cans...... 1 10 @ 1 12½
Pkld Cod, bbls..22 00 @— —
Hf bbls........11 00 @— —
Mackerel, No. 1.
Hf Bbls....... 9 50 @10 00
In Kits........ 1 85 @ 2 10
Ex Mess...... 3 25 @— —
Pkld Herring, bx 3 00 @ 3 50
Boston Smkd H'g 70 @— —

LIME, Etc.
Plaster, Golden Gate Mills.... 3 00 @ 3 25
Land Plaster, tn 10 00 @12 50
Lime, Sta Cruz, bbl.......... 1 25 @ 1 50
Cement, Rosendale.......... 2 00 @ 2 25
Portland...... 4 00 @ 4 50

NAILS.
Ass'ted sizes, keg 2 70 @ 2 75

OILS.
Pacific Glue Co's
Neatsfoot, No 1.1 00 @ 90
Castor, No 1.......1 35 @ —
do, No. 2........1 30 @ —
Baker's A A......1 25 @1 30
Olive, Plagnioi....5 25 @5 75
Possel.........4 75 @5 25
Palm, lb.......... 9 @ —
Linseed, Raw, bbl. 78 @ —
Boiled.......... 80 @ —
Cocoanut.......... 55 @ —
China nut, cs...... — @ 65
Sperm............1 40 @ —
Coast Whales..... — @ 32½
Polar .... — @ 35
Lard.......... — @ 70
Oleophine......... 22 @ 22
Devoe's Bril't..... 17½@ 18½
Photolite.......... — @ —
Nonpareil......... 31 @ 32½
Eureka........... 18 @ 42½
Barrel kerosene... 20 @ —
Downer Ker....... 35 @ —
Elaine........... 37½@ —

PAINTS.
Pure White Lead. 8 @ 8½
Whiting.......... 1½@ —
Putty.......... 4 @ 5
Chalk.......... 1½@ —
Paris White...... 2½@ —
Ochre.......... 3½@ —
Venetian Red..... 3½@ —
Averill Mixed Paint, gal.
White & tints...2 00 @2 40
Green, Blue & Ch Yellow......3 00 @3 50
Light Red......3 00 @3 50
Metallic Roof...1 30 @1 50

RICE.
China, Mixed, lb.. 4½@ 5
Hawaiian......... 6 @ —

SALT.
Cal. Bay, ton....15 00 @22 50
Common......10 00 @12 00
Carmen Id.......12 00 @14 00
Liverpool fine...19 00 @— —

SOAP.
Castile, lb......... 8 @ 15
Common brands.. 4½@ 8
Fancy brands..... 7 @ 8

SPICES.
Cloves, lb......... — @ 45
Cassia.......... 19 @ 20
Nutmegs.......... 85 @ 87½
Pepper Grain..... — @ 12
Pimento.......... 19 @ 20
Mustard, Cal., ½ lb glass........ — @1 25

SUGAR, ETC.
Cal. Cube, lb...... — @ 10½
Powdered......... — @ 10½
Fine crushed...... — @ 10½
Granulated....... — @ 10
Golden C......... — @ 8½
Cal. Syrup, kgs... 70 @ —
Hawaiian Mol'sses 26 @ 30

TEA.
Young Hyson, Moyune, etc..... — @ 51
Country pckd Gunpowder & Imperial.......... — @ 42½
Hyson.......... 30 @ 35
Fooo-Chow O..... 35 @ —
Japan, 1st quality 40 @ —
2d quality....... 20 @ 2

METALS.

[WHOLESALE.
Wednesday m., October 15, 1879.

Iron.—	
American Pig, soft, ton	28 00 @35 00
Scotch Pig, ton	26 00 @30 00
American White Pig, ton	25 00 @— —
Oregon Pig, ton	28 00 @35 00
Refined Bar	4 @ 8
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 8
Norway, according to thickness	7 @ 8
Copper.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
Steel.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @ —
Tin Plates.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7
Banca Tin	18 @— 20
Australian	15½@ 17
Zinc.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb, less than cask	9½@— 10
Nails.—	
Assorted sizes	3 50@4 50

LEATHER.

[WHOLESALE.]
Wednesday, m., October 15, 1879.

Sole Leather, heavy, lb	22 @ 29
Light	20 @ 24
Jodot, 8 Kil., doz	48 00 @50 34
11 to 13 Kil	46 00 @57 00
14 to 19 Kil	61 00 @73 00
Second Choice, 11 to 16 Kil	55 00 @70 00
Cornellian, 12 to 16 Kil	57 00 @67 00
Females, 12 to 13 Kil	63 00 @67 00
14 to 16 Kil	71 00 @76 00
Simon Ullmo, Females, 12 to 13 Kil	58 00 @62 50
14 to 15 Kil	66 00 @70 00
16 to 17 Kil	72 00 @74 00
Simon, 18 Kil	61 00 @63 00
20 Kil	65 00 @67 00
24 Kil	72 00 @74 00
Robert Calf, 7 and 9 Kil	35 00 @40 00
Kips, French, lb	1 00 @ 1 35
Cal. doz	40 00 @60 00
French Sheep, all colors	8 00 @15 00
Eastern Calf for Backs, lb	1 00 @ 1 25
Sheep Roans for Topping, all colors, doz	9 00 @13 00
For Linings	5 50 @10 50
al. Russet Sheep Linings	1 75 @ 4 50
oot Legs, French Calf, pair	4 00 @— —
BGood French Calf	4 00 @ 4 75
Best Jodot Calf	5 00 @ 6 25
Leather, Harness, lb	35 @ 37½
Fair Bridle, doz	48 10 @72 00
Skirting, lb	33 @ 37
Welt, doz	30 00 @50 00
Buff, ft	15 @ 17
Wax Side	15 @ 17

LUMBER.

Wednesday m., October 15, 1879.

CARGO PRICES OF REDWOOD.

Rough, M	13 00
Refuse	9 00
Clear	23 00
Clear Refuse	13 00
Rustic	23 50
Refuse	18 00
Surfaced	20 00
Refuse	14 00
Flooring	20 00
Refuse	12 00
Beaded Flooring	23 00
Refuse	13 00
Half-inch Siding	16 00
Refuse	14 00
Half-inch Surfaced	20 00
Refuse	14 00
Half-inch Battens	16 00
Pickets, Rough	11 00
Rough, Pointed	12 50
Fancy, Pointed	18 00
Shingles	1 75

PUGET SOUND PINE — RETAIL PRICE.

Rough, M	18 00
Fencing	18 00
Flooring and Step	28 80
Narrow	30 00
2d quality	25 00
Laths	3 50
Furring, lineal ft	

REDWOOD. — RETAIL PRICE.

Rough, M	18 00
Refuse	14 00
Pickets, Rough	15 00
Pointed	16 00
Fancy	22 60
Siding	20 50
Surfaced & Long Beaded	30 00
Flooring	30 00
Refuse	22 50
Half-inch Surfaced	30 00
Rustic, No. 1	30 00
Battens, lineal ft	
Shingles M	2 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by Sutro & Co.]

San Francisco, October 15, 3 p. m.

Silver, 25.
Gold Bars, 890@910. Silver Bars, 10@18 ₽ cent. discount.
Exchange on New York, 20, on London bankers, 49½@49¾. Commercial, 50; Paris, five francs ₽ dollar; Mexican dollars, 92
London Consols, 98, Bonds (4%), 105⅝.
Quicksilver in S. F., by the flask, ₽ lb, 33½c.

Signal Service Meteorological Report.

San Francisco.—Week ending October 14, 1879.

Oct. 8	Oct. 9	Oct. 10	Oct. 11	Oct. 12	Oct. 13	Oct. 14
Highest and Lowest Barometer.						
30.143	30.180	30.099	29.030	29.785	29.969	30.007
30.022	30.101	30.000	29.720	29.702	29.830	29.971
Maximum and Minimum Thermometer.						
63	62	62	63	50	58	59
50	52	50	50	52	49	60
Mean Daily Humidity.						
84	73.7	74	76	71.3	72	74.7
Prevailing Wind.						
W	W	SW	SW	SW	W	W
Wind—Miles Traveled.						
226	105	168	106	209	114	167
State of Weather.						
Clear.	Clear.	Clear.	Fair.	Clear.	Clear.	Clear.
Rainfall in Twenty-four Hours.						
			.07	.15		

Total rain during the season, from July 1, 1879, 0.81 in.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Alpha Hydraulic Gravel Mining Company.

Principal place of business, San Francisco, California. Location of works, Alpha Hill, Nevada Co., California.

Notice is hereby given that at a meeting of the Board of Directors held on the 2nd day of October, 1879, an assessment (No 1) of Twenty Cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold and silver coin, to the Secretary, at the office of said Company.

Any stock upon which this assessment shall remain unpaid on the Tenth day of November, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the Thirteenth day of December, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. JAMES IRELAND, Sec'y.

Office, No. 216 Sansome street, San Francisco, California

Orion Mining Company.—Location of

principal place of business, San Francisco, California. Location of works, Iowa Hill, Placer County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 9th day of October, 1879, an assessment (No. 5) of Thirty (30) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 28 Sansome street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 10th day of November, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on Tuesday, the 25th day of November, 1879, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors. P. CONKLIN, Secretary.

Office, No. 28 Sansome St. (up-stairs) San Francisco, Cal.

The Pacific Land and Trust Company.—

Location of principal place of business and works, San Francisco and State of California.

Notice is hereby given that at a meeting of the Board of Directors held on the eighteenth day of September, 1879, an assessment (No. 1) of One Dollar and Twenty-five cents per share was levied upon the capital stock of said corporation, payable immediately to the Secretary at the office of the company, 513 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on Saturday, October twenty-eighth (28th), 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before will be sold on Saturday, November eighteenth (18th), 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale. WM. ANDREWS, Jr., Secretary.

Office, 513 California street, San Francisco, Cal.

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We want several canvassing agents who will make it their business to solicit subscriptions and advertising for our first-class progressive newspapers. Men of ability and experience can secure good pay and permanent employment. Send references and state your past occupation, etc., to the publishers of this paper.

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Where you can get a crop every year; where you will make something every season; where you are sure of having a crop when prices are high; where you have a healthy place to live; where you can raise semi-tropical as well as other fruits; where you can raise a diversity of grain and vegetables and get a good price for them. Go and see the old Reading Grant (in the upper Sacramento Valley), and you will find such land for sale in sub-divisions to suit purchasers—at reasonable rates and on easy terms. Send stamp for map and circular to Edward Frisbie, proprietor, (on the Grant), Anderson, Shasta Co., Cal.

California Inventors

Should consult DEWEY & CO., American and Foreign Patent Solicitors. Established in 1860. Their long experience as journalists and large practice as patent attorneys enables them to offer Pacific Coast inventors far better service than they can obtain elsewhere. Send for free circulars of information. Office of the Mining and Scientific Press and Pacific Rural Press, No. 202 Sansome St., San Francisco.

Iron and Machine Works.

THOS. PENDERGAST. HENRY S. SMITH.

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MANUFACTURERS OF

IRON CASTINGS and MACHINERY

OF ALL KINDS.

Fremont Street, Bet. Howard and Folsom,

SAN FRANCISCO.

UNION IRON WORKS,

SACRAMENTO, CAL.

ROOT, NEILSON & CO.,

MANUFACTURERS OF

STEAM ENGINES, BOILERS AND ALL Kinds of Machinery for Mining Purposes.

Flouring Mills', Saw Mills' and Quartz Mills' Machinery constructed, fitted up and repaired.

Front Street, Between N and O Streets, SACRAMENTO, CAL.

PHELPS MANUFACTURING COMPANY,

Manufacturers of all kinds of

Wharf and Bridge Bolts, Railroad Treetle Work, Car Frames and Bolts, Machine Bolts, Set Screws and Tap Bolts, Lag or Coach Screws.

ALL STYLES OF FANCY HEAD BOLTS. HOT AND COLD PRESSED HEXAGONAL AND SQUARE NUTS, WASHERS, BOLT ENDS, TURNBUCKLES, ETC., ETC.

13, 15 and 17 Drumm St., near California,

SAN FRANCISCO, CAL.

Golden State & Miners Iron Works,

Manufacture Iron Castinge and Machinery of all Kinds at Greatly Reduced Rates.

STEVENSON'S PATENT

Mold-Board AMALGAMATORS,

Golden State Pressure Blowers.

First St., between Howard & Folsom, S. F.

Main Street Iron Works,

WM. DEACON, PROPRIETOR.

Nos. 131, 133 & 135 Main St., San Francisco.

Stationary and Marine Engines,

Shafting, Pulleys, and General Machine Work. Jobbing and repairing done Promptly and at Lowest Rates. Screw Propellors, Propellor and Steamboat Engines.

SAW MILLS and SAW MILL MACHINERY.

California Brass Foundry,

No. 125 First Street, Opposite Minna.

SAN FRANCISCO, CAL.

All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch. ☞PRICES MODERATE.☜

J. H. WEED. V. KINGWELL.

WM. H. BIRCH. JOHN ARGALL.

California Machine Works,

BIRCH, ARGALL & CO.,

119 Beale Street, San Francisco.

☞General Mechanical Engineers and Machinists. Steam Engines, Flour, Quartz and Mining Machinery. Sole manufacturers of Brodie's Patent Rock Crushers and Steel-Faced Tappits. Agents and Manufacturers of F. A. Youse's Patent Steam Packing Rings for Steam Pistons. The best ever invented; can be applied to any Piston Engines in true satisfaction by those using. Steam, Hydraulic and Sidewalk Elevators. Repairing promptly attended to.

STEAM ENGINES AND BOILERS

Of all sizes—from 2 to 60-Horse power. Also, Quartz Mills, Mining Pumps, Hoisting Machinery, Shafting, Iron Tanks, etc. For sale at the lowest prices by

J. HENDY, 49 and 51 Fremont Street, S. F.

THOMAS THOMPSON. THORNTON THOMPSON.

THOMPSON BROTHERS, EUREKA FOUNDRY,

129 and 131 Beale St., between Mission and Howard, S. F

MANUFACTURERS OF CASTINGS OF EVERY DESCRIPTION.

WIND MILL. One of the best made in this State for sale cheap on easy terms. Address, W. T. care of Dewey & Co., S. F.

GEORGE W. PRESCOTT. IRVING M. SCOTT. H. T. SCOTT.

UNION IRON WORKS.

Office, 61 First St. | Cor. First & Mission Sts., S. F. | P. O. Box, 2128.

BUILDERS OF

STEAM, AIR AND HYDRAULIC MACHINERY.

Agents of the Cameron Steam Pump.

Home Industry.—All Work Tested and Guaranteed.

Vertical Engines,	Baby Hoists,	Stamps,
Horizontal Engines,	Ventilating Fans,	Pans,
Automatic Cut-off Engines,	Rock Breakers,	Settlers,
Compound Condensing Engines,	Self-Feeders,	Retorts,
Shafting,	Pulleys,	Etc., Etc.

TRY OUR MAKE, CHEAPEST AND BEST IN USE.

Send for Late Circulars. PRESCOTT, SCOTT & CO

William Hawkins,

(SUCCESSOR TO HAWKINS & CANTRELL).

MACHINE WORKS,

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Manufacturer of

IMPROVED PORTABLE HOISTING ENGINES,

FOR MINING AND OTHER PURPOSES.

Also of the HAWKINS' PATENT ELEVATOR HOIST, for Hotels, Warehouses and Public Buildings.

Steam Engines and all Kinds of Mill and Mining Machinery.

Fulton Iron Works.

Hinckley, Spiers & Hayes.

(ESTABLISHED IN 1855.)

Works, Fremont and Howard Sts. | San Francisco, Cal. | Office, No. 213 Fremont St.

MANUFACTURERS OF

Marine Engines and Boilers,

Propeller Engines either High Pressure or Compound Stern or Side Wheel Engines.

Mining Machinery.

Hoisting Engines and Works, Cages, Ore Buckets, Ore Cars, Pumping Engines and Pumps, Water Buckets, Pump Columns, Air Compressors, Air Receivers, Air Pipes.

Mill Machinery.

Batteries for Dry or Wet Crushing, Amalgamating Pans, Settlers, Furnaces, Retorts, Concentrators, Ore Feeders, Rock Breakers, Furnaces for Reducing Ores Water Jackets, Etc.

Sugar Machinery.

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Miscellaneous Machinery.

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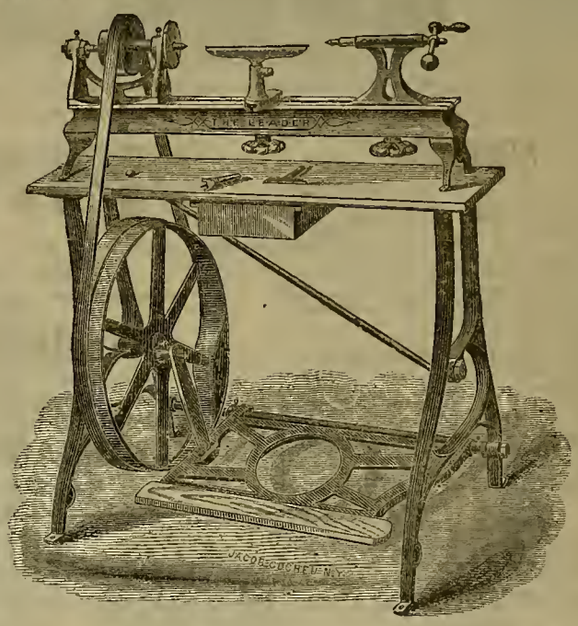

Material eighteen inches long and eight inches in diameter can be turned upon it. The pieces that accompany this Lathe without extra charge are two Tresses, two plain centers, one spur center for wood turning, and one face plate.

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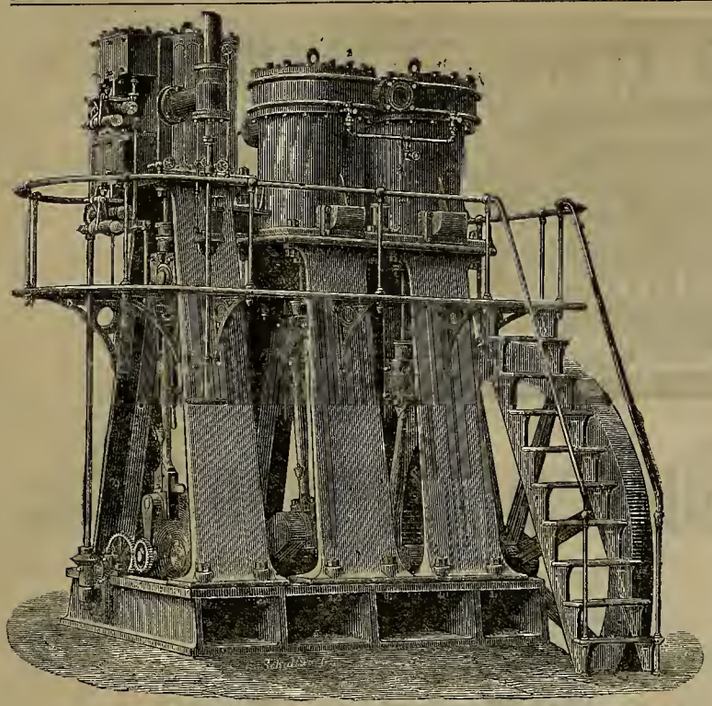

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It contains 142 pages, embracing illustrations of furnaces, implements and working apparatus.

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Concentration of Ores (of all kinds), including the Chlorination Process for Gold-bearing Sulphurets, Arseniurets, and Gold and Silver Ores generally, with 120 Lithographic Diagrams. 1867.

This work is unequaled by any other published, embracing the subjects treated. Its authority is highly esteemed and regarded by its readers; containing, as it does, much essential information to the Miner, Millman, Metallurgist, and other professional workers in ores and minerals, which cannot be found elsewhere in print. It also abounds throughout with facts and instructions rendered valuable by being clearly rendered together and in simple order. It contains 120 diagrams, illustrating machinery etc., which alone are of the greatest value. PRICE, $7.50

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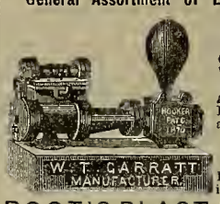

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, OCTOBER 25, 1879.

VOLUME XXXIX Number 17.

California Maintains Her Prestige Abroad.

While Dakota, Colorado and other intervening countries have, for the past few years, been receiving a large share of attention, this has not prevented free investments in the mines of California, which has retained her hold on the confidence of the outside world in a manner hardly to have been expected, considering the formidable character of her competitors. While our hydraulic mines have, of late, been much sought after in the East, our gold-bearing quartz veins have been by no means neglected. The lodes in the Bodie district seem to have enjoyed a preference, for the reason that such of them as are already brought into an actively productive condition have all yielded liberally, while those that are being prospected show remarkably well.

The more promising claims in this district appear to lie in groups or bunches, having often some one or more noted mine for a center. Thus, we find near Bodie Bluff, the Standard with the Bulwer, Bodie, Bechtel and other especially hopeful properties clustered around it. A little further north, near Queen Bee hill, occurs the original Noonday with the South Noonday, Red Cloud, Booker, etc., encircling it. In this, as in the Standard series further north, the work of exploitation, which is being pushed with vigor, points to the existence of valuable ore bodies. Hence a lively interest is kept up in these mines, causing shareholders to respond to the calls of directors for financial aid with alacrity, notwithstanding ore developments have, in some instances, been delayed to a vexatious extent. But a good gold mine is not to be dug out in a day, and, in view of what has been achieved in this district, shareholders evince good sense in holding on, in all cases, where work is being judiciously carried on and due economy observed. The former owners of the Standard, Bulwer and Bodie lost the chance of being made millionaires by letting go too soon, an experience that others seem disposed to profit by.

The Standard has enjoyed the benefits of an excellent administration from the first, nor has that of the other mines near by been at all faulty. This has also been the case with the other group, the management of the South Noonday, like that of the Standard, having been exceptionally good, this mine being also conspicuous for both the evidence of inherent merit and its favorable surroundings.

As regards investments in hydraulic mines, the bare along the Trinity and Klamath rivers appear to have the call at present, and it is said that a good deal of Eastern money is likely to be put into the mines in these northern counties on the recommendation of certain of our leading experts. As the mines in these out-lying localities remain in a comparatively primitive condition, it is probable enough that they present some advantages not common to the older districts; and may, therefore, well deserve the preference accorded them by parties just entering the field. We are of the opinion, in fact, that the opportunities for engaging in this branch of mining, though perhaps not very numerous, are exceptionally good in these northern counties, the gravel there being of high grade and the conditions generally favorable.

THE committee of the San Francisco Chamber of Commerce appointed to the congress discussing the construction of the Darien canal, reported that the cost was estimated at 1,070 millions of francs, or $214,000,000. It was also estimated that in ten years the annual tonnage would amount to seven and a quarter million tons. The toll of $3 per ton was deemed too high by the committee, when articles like wheat and certain ores were considered. The report was signed by Christian Christiansen and Elie Lazard.

THE steamship *Great Eastern* is to be fitted up with new boilers and machinery at a cost of £140,000, to carry cattle between London and Texas. She is capable of holding 2,000 head of cattle and 56,000 head of sheep.

Profits of Mining.

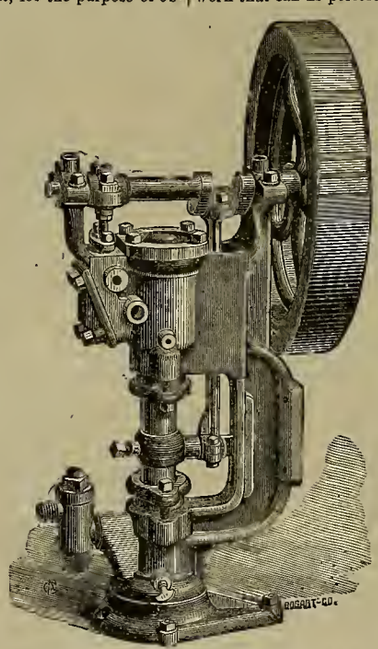
An exchange says: "No matter how fascinating, no business can be permanent that is not profitable as a whole. Gold and silver mining in the United States stands this test better than any other business, and to-day is better established than ever before." Aside from the speculative tendencies, there can be no question that active mining is a profitable business, but there are two elements that have cast a shadow upon the business, and which will always deter many capable individuals from engaging in it; these are speculating in the mine as property, and secondly, speculating in the stocks as representatives of its value. In the first instance the business is conducted very much as are any sales of real estate, with the only exception that the precious metal in the claim is the prize contended for. The prospector who makes a find, naturally desires to sell it as a whole, or at least a part interest in it, for the purpose of obtaining capital to work it. There is nothing very objectionable about this, unless deception is practiced. "The mine is there, go and see for yourself, or send an expert on whom you can rely." But when the mine assumes the shape of a corporation with a gigantic capital stock, which is supposed to represent a probable theoretical value, even magnified then in proportion to the sanguine imagination of the owners, the profits are not so apparent, because the element of *mining* does not enter in these stock transactions, they are mere "bets." It is useless to say that dividends are paid to stockholders. The stockholders are generally ephemeral, and do not hold on long enough to obtain dividends. The temptations are strong to rush into the stock business and acquire a fortune on a rise, but this is not investing in the mining business as it should be understood. This latter is investing in and actually working a mine, and the distinction should always be made when speaking of profits. The individual who invests his money in any business and leaves others to control it, cannot be said to be in the business, he is simply a "goose to be plucked" whenever the occasion may offer. With this modification of the matter, therefore, we agree with the statement that the mining business "has more elements of lasting strength, and of certain and regular profit than many other business adventures."

ADVANCE IN QUICKSILVER.—The price of quicksilver in this market was recently depressed to 34 and 34½ cents, and many sales were alleged to have been made at both figures. These prices existed October 9th, and at that date the quotation in London was £6 per bottle, on the 14th the price went up to £7 in London and 40 cents here. Since then private cables announced the price at £9. The cause of the advance is not given. It is known that there have been terrible floods in Spain, and there are rumors that the Almaden quicksilver mine in that country has been flooded. This would be a sufficient cause for the advance. Here stocks have become wonderfully scarce, and the price has been put up to 55 cents, with reported sales at that figure.

Boiler Feeder.

The Cope & Maxwell Manufacturing Company, of Hamilton, Ohio, of which company Messrs. Parke & Lacy, 417 Market street, San Francisco, are agents, have devised an excellent vertical crank and fly-wheel combined well-pump and boiler feeder, illustrated on this page, which is recommended for situations where the water is within the limit of suction, say 25 feet below the pump to source of supply. In cases where the water is beyond the limit or over 25 feet, the well pump is lowered down to the proper distance.

By means of the well pump cold water from a cistern, well or stream may be raised and delivered into a reservoir, tank or heater, and, after being heated, may be conducted to the boiler feed pump, and by it forced whilst hot into the boiler, thus accomplishing a double duty, a work that can be performed by no other single machine, meeting a necessity and fulfilling conditions in the line of supplying steam boilers never before provided for.



Vertical Crank and Fly-Wheel Boiler Feeder.

The well pump is made somewhat larger in capacity than the boiler feed pump; as they make stroke for stroke with each other, there will be an excess of water delivered by the lower pump which can be used for other purposes.

The material and workmanship in these machines are of the very best quality, and no pains is spared to make them the most perfect boiler feed pump in the market.

In situations where the feed water cannot be otherwise heated, the exhaust steam from the steam cylinder of the boiler feed pump can be turned into the suction pipe and condensed, forming a vacuum in the steam cylinder to the extent of the hight the water is being lifted by the pump, thus saving the heat contained in the exhaust steam, or the exhaust pipe can be turned into the tank or cistern from which the pump takes its supply of water, and thus utilize the heat from the exhaust steam.

These boiler feed pumps are made small enough to supply the smallest threshing, farm, road or domestic engine or boiler, and large enough to supply a battery of two or three horizontal boilers.

For anything larger, the company make a horizontal crank and fly-wheel engine, with double-acting pump.

PERSONAL.—Messrs. Dewey & Ewer, publishers and proprietors of the PRESS, have gone to Los Angeles to attend the Southern California Horticultural and Agricultural fairs. We can recommend these gentlemen to any one whom they may meet as modest and gentle-mannered persons, generally well behaved and highly esteemed at home, and believed to be capable of withstanding a moderate amount of temptation. Therefore, we feel confident they will do themselves and us much credit by their general deportment, especially as they are going to associate with so bright and upright a people as *los angeles*. May they return better than they went!

Room for Inventions.

The demands made upon scientific knowledge far exceed the supply. Although we may be said to have arrived at an advanced stage of learning, we undoubtedly possess but a limited amount when comparison is made with the necessities which as yet know no law. There are so many theories broached upon important subjects that fully the major portion of the requirements of manufacturers and miners are the victims of experiment. We want improvements in processes—not experimental improvements, but practical working and satisfactory processes, capable of substantial accomplishment of the theories claimed for them. Employers of steam engines demand more power from the enormous quantity of fuel consumed, wasts products are waiting to be utilized, streams and atmospheres are crying out for relief from the pollution that is being thrown into them.

It is true inventors are endeavoring to provide means of supplying these demands, but frequently fail to satisfy the demand for the adaptation of new principles because the knowledge of the latter are incomplete. Discovery is usually the basis of invention, and the greatest utilities have been thence obtained, rather than by the exercise of invention upon old knowledge acquired. A machine for completely converting heat into mechanical force is required, but so far our scientific knowledge of the properties of heat has not led us up to the point of discovery upon which to base an invention of that kind. One invention leads to an innumerable chain of inventions, all of them more or less improvements, but still inventions. The field is immense, with abundance of room for inventors.

U. S. GEODETIC SURVEY.—We are informed by a recent number of the Reno *Gazette* that the astronomical and geodetic party under charge of Prof. Davidson has finished its work at Station Round Top in the Sierra Nevada, south of the Carson pass, but not before it had encountered two very severe storms of snow and wind, in which the thermometer was nearly zero for many days. When they came out the snow averaged four feet in depth, and the men and animals sank three feet into it. The astronomical and geodetic work at Round Top has been successfully executed in less than two months, although the lines to distant stations in the Coast Range are from 120 to 160 miles in length, and pass through the dense smoke stratum of the Sacramento valley. The lines are longer than any ever undertaken in Europe. Nevertheless it is understood that the results are in the highest degree satisfactory. A special series of observations was made to determine the coefficient of refraction at these great elevations. To exhibit the peculiar orographical features of Round Top (named apparently by the rule of contraries because it is a great, sharp backbone), one of the officers has made a topographical survey of the mountain; whilst Watkins, the celebrated Yosemite photographer of San Francisco, has executed some fine large photos of the mountain, to illustrate its general and detailed characteristics. Prof. Davidson has returned from the mountains, and will, at the next meeting of the California Academy of Sciences, read a paper on the subject of the work accomplished by his party. This we shall publish after it has been read.

NICKEL MINING IN NORWAY.—It is alleged by the London *Times*, that Norway is the principal source of the nickel supply, and furnishes quite one-third of the yield of the world. The first mine was opened in 1846, by an English company, in the valley of Espedal, in the mountain district of Sondre-Gudbrandsdal, but this was closed in 1857 in consequence of the difficulty of the approach, and the absence of communications. Subsequently to this, mines were opened at Ringerike and Bamble, near Skien, and from 1861-5 there were 11 nickel mines worked, averaging 3,450 tons per annum. In the latter year the production rose to 5,200 tons from 14 mines, and it gradually increased until 1875, when it attained its maximum at 34,550 tons. The greater part of this yield is exported in the shape of ore.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—Eds.

El Dorado Mines.

EDITORS PRESS:—I have been prevented by causes beyond my control from sooner resuming my letters, but I will now try again.

The Bower Mine,

On the Greenwood seam belt, was where, metaphorically speaking, I left you standing, and before following the belt down towards the Middle Fork of the American river, we will look at the Bower mine a little further. The late rains have washed off the dust, and it is only round that section that the plague of dust could be realized, and now wherever cuts, shafts or grades have been made, veins of soft and hard quartz are exposed in every direction, and the ledge can be easily traced. The mine itself forms a basin of 40 acres, with rising banks around, and is nearly encircled by the California Water Co.'s canal, thus securing an ample supply of water. Mr. Bower is now engaged in putting in a water blast, as foul air has for some weeks delayed progress in his tunnel, but he still expects in a few weeks to be able to raise to the surface and begin to develop in earnest, when I hope the company will be handsomely repaid for their great undertaking, by many years of remunerative work. Proceeding northward we come to the mine owned by

Blabtrin & Co.,

Who have been steadily prospecting till a few weeks ago, when scarcity of water induced them to close down for a while. Their present workings are on a slide or outpour from the main belt, and this being in the American canyon itself afforded them a chance to work in pay from the start. They will have to run off a large amount of frontage yet ere they can touch the main belt, but while they can fully make expenses in doing so they are quite satisfied, as who would not in these times! Crossing the canyon we next come to the

Von Bremer Mine,

It being the next in operation, though several other promising locations exist. Mr. Henry Von Bremer & Co. have done a large amount of work on their claim, which has a good natural outlet into the canyon, and have still a promising and I believe a profitable mine. Following the seam belt across the range (a rough undertaking) there is little to notice till we sight the Middle Fork. Two large wheels and the usual wheelbarrows and gang planks show that some still have faith in the "bars," and on the bank of the river we come to the

Dolly Varden,

A claim recently relocated, Dr. G. W. Handy, of Oakland, being the new owner. The work previously done was from the edge of the river, two good leads being discovered, but the depth of bank and price of water made the work at once dangerous and too expensive under the old system of hydraulic mining. One of the former proprietors losing his life by a slide the mine was shut down, and has since passed from hand to hand unimproved, till relocated by its present owners. I understand that it is their intention at an early date to open the Dolly Varden with all the modern improvements; and I believe there is every warrant for their doing so, as this claim will make a great outlet for an almost exhaustless portion of the "belt." This now crosses the river into Placer county, I will therefore leave the porphyry for the present, and after looking into

The Wine Garden,

A pleasant little nook reclaimed from the wild and rocky river bank and now a blooming orchard and vineyard, planted and cared for by Mr. William Wirgis, the genial host, and his brother, both old-time miners and long residents, and tasting some of his excellent vintage and luscious fruit will travel on to the

Sardine Mine,

On Main Bar. In the early days of river mining this claim proved so rich that reports of the prospects obtained are almost fabulous, in these days of poor diggings; but here again the old-time system of mining proved inadequate. The great expense of opening, the limited time of working, and chance of losing all the machinery each fall, prevented the Sardine mine from being worked, but those who had faith waited from year to year till this last summer a company was formed and under the management of Mr. Thomas Sissions, to whose active energy and mining ability the entire enterprise is really due. They are now sinking on the bank of the river, above all average high-water mark, and at a depth of 75 feet propose to drift towards and under the river and take out all that remains of the fabulous wealth said to exist there. The shaft is now down nearly 50 feet and a small pump keeps it clear of water, but Mr. Sissions has a larger one in readiness for an emergency, and is preparing for a winter campaign by housing his hoisting works and pumps. It will take him eight or ten weeks yet to gain the required depth, the rock being very hard, and he will then have to drift some 40 or 60 feet to tap the gravel. This is a claim of great expectations, and with a not unreasonable prospect of their fulfillment.

The Golden Ophir.

Returning up the canyon we cross over from the Cederberg (a once rich and notable quartz mine, and which will I think again be heard from) we pass over to the Golden Ophir, a portion of which was formerly known as the "International." This mine is composed of slate veins with quartz seams, but from the slate free gold and rich sulphurets are obtained. Col. T. G. Bilty, who has long been an earnest and successful factor in developing the Greenwood mines and introducing capital, has spent much time and coin in opening up this claim. New machinery has been recently erected by Mr. F. A. Huntington and a Mr. Howland of your city, on a new principle; and after one of those delays which will occur in the best regulated mines, the jovial and indefatigable Colonel has succeeded in getting his mine and mill in running order, and under the new ownership, as I understand of Judge Lawrence and others, the mill is now at work, but as my limits have been reached I must reserve fuller remarks of this property until my next. D.

Greenwood, Oct. 14th, 1879.

Nevada Mines, Copper, Etc.

EDITORS PRESS:—From Aurora northward towards Virginia City, at about half the distance, a few mining enterprises of much real value are located, but to which we have rarely seen reference made.

The first is Pine Grove, 15 miles east from Compton's ranch, reached by a trail or much longer winding road over a high, rugged mountain range. Here a fine gold and silver vein, of good workable thickness, runs lengthwise along a spur of the mountain some three miles. The mines on this vein have been worked 14 years; but at first, in the uncertainty of the dip and other features of the lead, many tunnels were run in a wrong direction and much labor lost. Gradually this difficulty was overcome, till now, in a knowledge of facts learned by experience, work is pursued with a fair uniform remunerative yield to the owners. A few shafts have been sunk, the main one 300 feet deep; but the principal work is by tunnels, one or two of which are 1,000 feet in length. The various claims have at length been nearly all consolidated into two, and worked systematically, of which the upper one is superintended and mostly owned by Mr. D. Wilson; the lower one is directed by C. W. Fish. The town, or, rather, two villages, may include 400 people, of which many have families. From what we saw and could learn, we judged the community to be more than usually peaceable and diligent in labor, prospering in all real interests. This may be owing to a remarkable fact that here no mining work is done on the Sabbath, a regulation observed by Mr. Wilson from an early day, when he first came to the locality. The results of such a course are always decidedly advantageous in improved morals, better social good order, greater intelligence, more general good health, longer life, and finally, in increased wealth. We know of only one other mining camp or claim observing this regulation in the State of Nevada, and that is a new enterprise, under the direction of ex-Governor Blasedell, eight miles southeast of Pine Grove, which we could not, at this time, visit.

Copper Mines.

Thirty miles north of Compton's on the northeast side of Smith's valley, in the foothills, is one of four copper mines in that region of very great interest. It is the mine of Ludwick & Carter, and runs into the mountain between lime and porphyry walls in connection with the best of iron ore. The copper exists in its various compounds, often remarkably rich—60% or 70%—and in immense quantity. It is not an even, regular vein, but lies more in vast deposits, connected sometimes by only a seam, and again by an inch or two-inch vein, corresponding to the common mineral veins in lime. The mine is a beautiful one, entirely dry, admirably worked, and easily entered by a tunnel. The ore is brought out, carefully sorted, and the best sent by freight to Dayton for refining, to be manufactured into bluestone or sulphate of copper for the purpose of silver reduction. This copper mine, under the superintendency of Mr. Ludwick, is one of the neatest and most pleasant mines we ever visited.

Again, over the rugged range, three miles east, is another admirable copper mine, called Daniels, superintendent Mr. J. McConnell. It is dry, like the previous, and farther across, very uniform in character, easily quarried, but not quite as rich. It is a splendid mine, and a mile or two in length. One very remarkable feature of it is the natural bluestone or sulphate, in immense seams, some an inch and a half in thickness, separated by thin clay deposits, and all appearing as perfect as the crystallized manufactured sulphate. This natural production is a great rarity in the world—so uncommon that a Bonanza chemist of Story county denied to us the possibility of its existence. Yet there it is, clear and distinct, in scores or hundreds of layers, in this Daniels mine. The explanation for it is that the vein is in a dry region, and is located so as never to be reached by rain to dissolve it away, as would be the case elsewhere.

Another copper mine is two miles south of the last, higher in the range, and owned mostly by Mr. Spragg. It is the oldest of all, well developed, but not now worked in force. We did not visit it, but were informed of its worth by others. Besides these three, there are a few others to be developed, if there were a greater demand and better market for copper. Yet one on a low knoll in the valley has formerly been quite vigorously mined, though it is now lying entirely inactive.

These were the best mines we visited on our trip, as we returned to the point whence we started four months since. On the whole, we have been more and more impressed by the evident number, variety, extent and richness of the mines of the State of Nevada. The work of their development has assuredly only commenced, while possibly not a tenth part of the valuable leads are yet discovered. Many once worked and abandoned as worthless are found to have been a failure only through the ignorance of their first claimants, and now are yielding large regular returns, and are likely to do so for ages to come. Yet surely there are also thousands which have been proved really worthless, teaching the lesson that the greatest care is needed and the best judgment in determining upon a mining enterprise. S. V. B.

OCTOBER IN THE SIERRA.—Upon the above subject the Truckee *Republican* says: The present winter begins with unusual severity, and in mid-autumn. For an entire week furious storms and whirling masses of snow have prevailed with only brief interruptions. Snow covers the summits to a depth of an least two feet. Extreme cold has accompanied this October storm. Icicles, frost and frozen roads betoken the strangeness of the freak which nature seems to be taking. The terrified owners of herds of cattle and flocks of sheep, who are accustomed to remain in the mountains till the last of October, are hurrying their stock over the summit with all the rapidity possible. Although they know each turn and angle of the well-beaten highway, yet the passing of the snow-covered Sierra is attended with the utmost difficulty and danger. A fierce hurricane, only last week, twisted hundreds of forest pines from their roots, and hurled them crashing to the earth. Caught in such a gale, the herds and flocks of the mountains would fare badly, and many of the animals would doubtless perish. Caught on the summits in a snow-storm, without hay or feed of any kind, the danger of destruction would be most imminent. Even at best, with such cold, piercing weather as we are having, the journey must be fraught with toil, exposure and dread.

NEW GOLD FIELDS IN TASMANIA.—New gold fields have been discovered in Tasmania. At least so says the Melbourne *Argus* on the authority of its Launceston correspondent, who announces the advent in his city of a man with 70 ounces of gold, obtained on the Pieman river, west coast of Tasmania, and the prompt departure from Launceston of a large number of diggers, bound for the new workings. These men have embarked in a coasting steamer which will convey them to Pieman river, whence they tramp it for 70 miles through the bush to the locality that has proved so productive of the precious metal. A vessel named the *Little Maud*, which arrived at Circular Head on the 23d of last May, brought the news that a party of three men were "realizing" an ounce and a half of gold per diem at the diggings. This intelligence naturally caused considerable excitement in Melbourne, whence it appears to have been telegraphed to all parts of the Australian continent. The population of Tasmania may be expected to increase with extraordinary rapidity should further exploration and experiment confirm the statements of the lucky diggers who have already come into Launceston with their treasure.

PACIFIC COAST PETROLEUM.—The San Jose *Mercury* informs us of the successful termination of oil prospecting. It says: After many discouragements and disappointments, sufficient to have caused most people to have abandoned the undertaking, the oil-borers in the Moody gulch, in this county, in the Santa Cruz mountains, have met with grand success. A large number of wells have been bored in this and San Mateo counties, but in none of them has petroleum been found in paying quantities, until on Friday last the Dull brothers, employed by the Santa Clara Petroleum Company, at a depth of 600 feet, while boring through a stratum in which they least expected to find oil, struck a vein which spurted petroleum to a hight of over 100 feet above the top of the well. Being unprepared for such a surprise, it is estimated that more than 100 barrels of oil ran to waste. After a time the flow subsided, to be resumed at regular intervals ever since. All the available help in the vicinity of the well was immediately put to work, and the second flow was prepared for and all saved. The excitement in the oil region is intense. The petroleum is of a superior quality.

EUCALYPTUS VS. PHYLLOXERA.—According to *Les Mondes*, the ravages of the phylloxera may be checked by planting the eucalyptus near the vineyards. It is contended by the writer of the article that, from the analogy of imported insects, such as the housebug, the cockroach, the American apple-blight, etc., there are no grounds for expecting that the pest of the vines will disappear of itself.

The Caribou Mines, Idaho.

A miner in a late issue of the Denver *Tribune*, speaking of the Upper Snake river and its tributaries says, with reference to the Caribou mines:

We have here in this section of Idaho one of the best deposits in the Territory, extending from Iowa gulch on the east, to Keenan gulch on the west, a distance of ten miles. The deposits are from 10 to 40 feet in depth, and resemble somewhat that country in and about Forest Hill, in California, which yielded $15,000,000 in gold for only two miles in length, and is still worked with good results.

The importance of Caribou as a gold-bearing district is no longer a question of doubt. For many years it has been known that gold existed through the various canyons that make their way from Caribou mountain and empty into Snake river. Extensive placer and hydraulic mining is now being done on Iowa bar, only two and one-half miles down the northern slope of Old Caribou. The annual yield of gold from the placers has at one time and another fluctuated considerably.

Quartz was first discovered in 1874, by some Montana miners on the southern slope and near the summit of Caribou mountain, and at the head of Tin Cup, a stream which empties into Salt river. The discovery was made by Dan Griffith and Jeff Thompson, who did some prospecting on the mountain. In those days quartz attracted but little, if any attention. After years of prospecting through Nevada and Utah, Griffith came to the conclusion to return to Caribou and further test his first find, which he did, meeting with results that induced him to make a location called the Oneida, the first quartz claim made and discovered on Caribou mountain.

A few years since a prospector well known all over the coast, named John Robinson, wandered in here, and after a careful examination of the camp and its surroundings, came to the conclusion from the amount of auriferous gravel deposited below, that there must be somewhere in the mountains huge quartz veins of immense value, and to find them, he at once went to work. In prospecting the mountain he found a porphyry belt about a half mile wide, lying on the northern slope of the mountain, running in a northwesterly and southeasterly direction, in which veins are found, and carry the same general course as the porphyry. He made a location called the Robinson, about 1,500 feet northwesterly from the Oneida, and at the head of Bilk gulch, every foot of which prospects well in gold from the side lines of the Robinson to where they are working the placers.

On the southern slope of the mountain another belt of porphyry is found, having the same course and strike as the one on the north side. Several very promising locations have been made, and are being worked vigorously. The most prominent, because large developments are being made, is called the Northern Light, owned by Hiram House & Co. The Northern Light extension is opening and looks well, and also the Virginia, owned by R. D. Howe, of Salt Lake City. Another very promising location is the Orphan Boy, owned by Charles Wilkes & Co.

The Oneida is opened by a shaft at the point of location to the depth of 120 feet, with drifts both ways on the vein about 30 feet, showing a well-defined vein of free gold ore from top to bottom. They have several openings on the vein south of their location point; they have also a tunnel near their northwestern boundary line, and have just made application for a patent. This mine is owned by Sweeney, Griffin and Nealson, all old miners and residents of the camp.

The Robinson and Austin mines are regarded as *the* mines from the fact that they have more ore in eight and more developments than any others in camp. Ore from 18 to 40 feet wide can be seen the entire length of the locations, and of a fine average grade. Knowing the value and being fully satisfied of the permanency of the supply of ore, the owners have decided to be conservative at the outset, and not to expend money too hastily, but wish everything done to be of permanent service. They are now putting up boarding houses for the men, and preparations are being made to erect two or more shaft houses over the different openings on the mines, so that developments can be made during the winter months. A patent has been applied for both the Robinson and Austin.

Next to the Austin is the Nabob group of mines, located at the head of Anderson gulch, called the Nabob, Peterson and Boss. These locations are being worked through the aid of a Mr. Byrum, of New York, a gentleman of considerable mining experience. Three shafts are being sunk on the different veins, showing a fine average grade of ore. I understand it is the intention of the owners to push developments all winter with a view of building a mill next spring.

WEEDS.—Prof. Gray has been led to conclude that self-fertilization is neither the cause, nor a perceptible cause of the pretotency of the European plants which are weeds in North America. A cursory examination has brought him to a similar conclusion regarding the indigenous weeds of the Atlantic States—these herbs which, under new conditions, have propagated most abundantly and rapidly, and competed most successfully in the strife for the possession of fields that have taken the place of forests.

MECHANICAL PROGRESS.

Weldless Chains and Cables.

Chains and cables, says the *Mining Journal*, have hitherto been made of iron generally from round bars or rods, and bent into shape and each link welded, but Mr. W. Deakin, of Birmingham, has invented a process which consists firstly in making chains and cables from steel, homogeneous, or metals such as Bessemer, Siemens, or similar material; and, secondly, in constructing the said chains and cables in such a manner that the operation of welding is entirely avoided and dispensed with, thereby producing a perfectly weldless chain or cable from end to end.

This may be effected in various ways, as for instance, he can take a piece of a bar of the said metal formed to any convenient shape and design suitable to the multifarious and numerous purposes for which chains or cables are required, and which may be bent into form by any suitable appliances, and manipulated by such means as hammers, rolls, chains, cutters, punches, presses, stamps or dies, or their equivalents, and actuated by steam, hydraulic, or other convenient power, and by such means to admit of one link being lapped, doubled and looped through another and so on to the completion of the chain without welding of any kind. Or he may roll such metal into plates, plain or indented, of the desired thickness, and stamp or cut out blanks therefrom of the required shape and dimensions for forming such weldless links, to be afterwards made into a chain or cable according to his invention; or he may cast such links into the suitable form required for the purpose, and subject such links to the operation of hammering, stamping, or pressing into the finished form, the said process contributing very materially to the solidifying and improving of the metal under operation.

It is claimed that by this process the cables possess increased strength and greater durability, and are of less weight than the welded. Besides mathematical accuracy in the link is secured, and the strain equally distributed without a weak point of attack. The element of cheapness is also very great.

Carving Attachment for Lathes.

The last number of the *Scientific American* gives a description of a carving apparatus from the workshops of M. Arbey, of Paris, France. It is intended to be attached to common lathes for the purpose of grooving, channeling and ornamenting columns, balusters, table-legs and similar articles of irregular shape. The carving attachment is placed on a traveling carriage, and supported on an adjustable cylindrical standard, to which the balanced arms of the cutter shaft are pivoted, the latter being revolved by a pulley and belt connection with a traveling pulley of the cutter-actuating shaft. The cutter shaft is movable on its bearings by a lever handle, while the pulley is retained by a clutch connection with a fixed brace of the weighted arms, and it is raised or lowered by means of a curved arm and guide roller passing along the pattern of the form. When a table-leg or other object is held in position of rest in the lathe, the cutting tool passes longitudinally along the same, and works out in it a groove or channel. The dividing disk being turned for the distance of one subdivision after each channel is completed, the next channel is then produced by the return motion of the carriage. By turning the object slowly in the lathe, simultaneously with the revolving and traversing motion of the cutter, helicoidal channels or grooves are formed. For grooving conical parts the cutter shaft is guided along an inclined guide pattern, or its axis is placed at an angle to the longitudinal axis of the lathe. The cutter adjusts itself to the shape of the object, and carves, by its uniform forward motion, an ornamental groove of equal depth throughout the entire length. For the purpose of pearling or doing other ornamental carving, the cutting tool is guided to the work by a handle, while the object is turned in the regular manner by the dividing disk, so that the pearls may be formed at uniform distances.

The adjustability of the cylindrical standard, in connection with the balanced cutter shaft and handles, admits of the convenient and accurate handling of the carving attachment, so that a large variety of ornamental work may be accomplished on this machine quickly and economically.

CERAMIC POTTERY ART. — For 30 years British potters have looked with jealous eyes upon the rapid growth of the pottery interest in America. Pottery in the United States, as a practical investment and assured process, dates back to 1843; in 1852 it was regarded worthy of special consideration, but it is only 17 years ago that the art assumed an important aspect. Artistically viewed, England has the advantage of 300 years of experience, and the bulk of the trade of all the world. A curious fact in this connection, in view of the rivalry now existing between England and America, and one unknown to most potters, is that in 1632, about the time when the first chinaware was made in England, the principal clay used in its manufacture was obtained from America, being purchased from the Cherokee Indians of the Carolinas, and was called by them *unaker*. This material was used for 30 years, and only abandoned because of the great expense of transportation. At that time great fears were entertained in England lest America should be able to flood the world with a superior china, but the china clay beds at Cornwall arrested the impending danger. To-day, however, the ceramic pottery art as developed at Trenton, N. J., promises to cope successfully with the best goods of Staffordshire, England. Prof. Longfellow has pleasantly described the progress of this art in one of his recent poems.—*Ex.*

RAISING CREAM BY CENTRIFUGAL FORCE.—German inventors have for some time been attempting to accomplish the quick separation of cream in the fresh milk with the aid of centrifugal machines. As the result of their efforts, we may perhaps soon look for quite a revolution in dairy matters, since what now requires several hours may be as well done in one hour or less. The first attempts were far from successful; but by the latest improvement the cream is drawn off while the vessel containing it is still in rapid motion, instead of after stopping it, and waiting till the milk has become quiet. The apparatus is made with a capacity of either 100 or 200 quarts. After it has been revolving rapidly for 20 or 30 minutes, and while still in motion, a quantity of skim milk is allowed to flow in; as the vessel was already full before, the cream is crowded out, and escapes through an opening provided for the purpose. Thus from 80% to 90% of the cream may be obtained in this short space of time. The New York *Tribune* says that an American inventor has been recently working in the same direction, and somewhat on the same plan, and that with his apparatus he has so completely removed the cream in 15 minutes that when the skim milk was set aside for 24 hours hardly any cream was deposited, and that he made butter from the milk within an hour after it was drawn from the cow.

A SOLAR ENGINE.—If the various schemes for utilizing the waste forces of nature are only partially successful, a tremendous quantity of power will convert the desert places of the earth into gardens. Capt. Ericsson has been engaged for the past 15 years, it is said, perfecting his invention of a solar engine. If erected near the seaboard, where water is to be had, the new engine will, he claims, generate steam, and where water is not procurable atmospheric air may be made the medium for transmitting the solar energy to the motor. In recent experiments under a clear sun, the engine worked with perfect uniformity at a velocity of 200 revolutions per minute, and consumed only a part of the steam furnished. To obtain some idea of the future possibilities of this engine, says an exchange, it should be borne in mind that there is a rainless region extending from the northwest coast of Africa to Mongolia, 9,000 miles in length and nearly 1,000 miles wide. Estimating a width of one mile only to be employed, not less than 22,300,000 solar engines, each of 100 horse-power, could be kept in constant operation nine hours a day by utilizing that heat which is now wasted on the comparatively small areas of land extending along some of the water fronts of the sunburnt regions of the earth.

MARINE VELOCIPEDE.—A curious machine for skimming over the surface of water has been devised by E. P. Harrington, a Detroit inventor. It has been shown by experiment to be a success, although the present machine is rather crude. It is proposed, however, to build it according to new designs, for practical uses. This water velocipede will have hand levers, which will operate a compound crank to propel the wheel. The speed can be accelerated by a combined hand and tread force. The buoyancy will be obtained from two swans, upon the backs of which will rest the weight of the rider. The wheel will also have a buoyancy of many pounds. The whole affair, thus sustained, will be as safe as any water craft, and may be operated by either lady or gentleman. When arrangements have been completed, these marine velocipedes may come into general use on the water, and will be a novel adjunct to aquatic sports. The regattas will be incomplete without a marine velocipede race. The velocipede owned by Mr. Harrington has been ridden by his daughter with safety on a small body of water. The invention will be known as the Detroit marine velocipede.

FIRE EXTINGUISHER.—At the exhibition of applied science now in progress in the Palais de l'Industrie, Paris, Senor Bariolas exhibited a *mata-fuegos*, or fire extinguisher. It resembles the well-known *extincteur* in outward appearance. It is filled with water, to which is added a charge of bicarbonate of soda and some other ingredients; and a small cylinder, inside the large, is filled with a solution of tartaric acid, etc. When it is required to bring the appliance into action, communication is made between the acid and alkaline mixtures by opening a valve by means of a handle and screw, when carbonic acid gas is evolved, which by pressing on the surface of the water, causes it to issue in a jet of 50 feet, the extinguishing action of the water being of course aided by the carbonic acid. The tartaric acid does not corrode the metal as sulphuric acid does, nor does it injure wood-work, etc. A pile of logs impregnated with tar and petroleum, and another of tar barrels were set well alight, when one ordinary No. 3 appliance extinguished both in one and a quarter minutes.

SCIENTIFIC PROGRESS.

A Wonderful Lubricant.

Grease has been deprived of one of its constituents by Senor Uncita, which gives it many wonderful qualities, if we may judge from the experiments lately made at the present exhibition of applied science in Paris, France. The *Iron* says: Two open boilers, made of tinned sheet iron, were put upon two coke furnaces of equal intensity; but the bottom of one of the boilers was coated with the grease outside, so as to be in immediate contact with the flame, whereas the other was not so coated. The former began to give off steam in a quarter of an hour, and the latter not until half an hour had elapsed; whence it may be inferred that the grease increases the conductibility of the metal, so that with a given quantity of fuel more water is turned into steam. A brass lubricator, of cylindrical form, filled with the grease, was then plunged into the water in the coated boiler, and, almost immediately, minute particles of the lubricant began to issue from a small hole in one end, rise to the surface, and gradually spread themselves over it. This was to show the application to the interior of a steam boiler for preventing incrustations, three grammes (about 1½ drachms avoird.) being used for each horse-power. The grease is also carried along by the steam into the cylinders, rendering any other lubrication unnecessary. Notwithstanding the cooling effect produced by the lubricator, a large body in proportion, the water in the coated boiler bubbled violently in an hour from the time of its being placed in the fire, whereas the other, not coated, did not boil in an hour and a half, when the experiment was stopped. A portion of the grease was wiped off from the bottom of the coated boiler and thrown on to the fire, when it immediately flared and was consumed. The tin bottom was as bright as before, but that of the other boiler gave evidence of the action of the fire. This was to show, on a small scale, that boiler plates exposed to the action of the fire do not become burnt. And, indeed, this fact follows as a natural consequence of the other point established, viz.: the increased conductibility given to the plates. Those who witnessed the demonstration were most astonished to see that a stick dipped in the grease made marks on the hot sides of the boiler and furnace as distinct as lines with a drawing-pen, and which did not run together, as they would have done if made with ordinary grease. So far the experiments have been most conclusive, fully bearing out the official certificate of the Spanish government; and it will be interesting to watch the result of a continued application to steam boilers on the scale of actual practice.

FUSING METALS WITHOUT FIRE.—A remarkable discovery has been made by Jacob Reese, of Pittsburg, Pa. He says he is able to melt instantly a bar of cast-steel one inch in diameter—which cannot be fused in less than five minutes in the highest furnace heat attainable—simply by throwing against it a column of air having a velocity of 25,000 feet a minute. The instant the air touches the metal fusion takes place. He says further: "By furnace heat it requires many hours, and sometimes many days, to anneal metals. By a recent discovery which I have made, I can anneal bars of iron or steel at the rate of one foot per second, thus increasing the ductility of the metal 100%, without the use of other fuel than that contained in the metal itself. I simply unlock the occluded (latent) heat. It becomes sensible and enlarges the metal, and by the method of doing this the enlargement is made permanent, that is, it does not contract to its original limit.

ANIMAL RUBBER.—An insect which produces a species of india rubber has been recently discovered in the district of Yucatan, Central America, by an American explorer. It is called Neen, and belongs to the Coccus family; feeds on the mango tree, and swarms in these regions. It is of considerable size, yellowish brown in color, and emits a peculiar oily odor. The body of the insect contains a large proportion of grease, which is highly prized by the natives for applying to the skin on account of its medicinal properties. When exposed to great heat the lighter oils of the grease volatilize, leaving a tough wax behind which resembles shellac, and may be used for making varnish or lacquer. When burnt this wax produces a thick semi-fluid mass, like a solution of india rubber, and it is expected that this glutinous liquid will be very valuable for cement and waterproofing.

A RACE WITH THUMBS ON THEIR FEET.—Mr. Tremlett, the British Consul, at Saigon, in his report this year, mentions as a remarkable peculiarity of the natives of the country that they have the great toe of each foot separated from the others, like the thumb of the hand, and it can be used in much the same manner, though not to the same extent. This distinctive mark of an Annamite is not, however, usually seen in the vicinity of Saigon, but is now confined to the inhabitants of the more northern section of the empire, where the race has remained more distinct. This peculiarity is the meaning of the native name for the Annamite race; and that the name and peculiarity are of great antiquity is shown by the mention in Chinese annals 2300 B. C. as that (or those) of one of the "four barbarian" tribes that then formed the boundaries of the Chinese Empire.

THE CELLULOID MARVEL.—A capital example of those numerous industrial revolutions of which we have spoken, and which are peculiarly characteristic of America, is furnished by the new article celluloid. Although it was invented nine or ten years ago (by two brothers named Hyatt), its perfect manufacture has been regularly in progress for only about five years, and is considered to be still in its infancy; yet immense quantities of the substance are produced; it is converted into a wonderful variety of forms, and new modes of applying it are discovered almost daily. This composition of tissue paper, camphor, and certain chemicals is already used for billiard balls, combs, backs of brushes, hand mirrors and other toilet articles, whip, cane and umbrella handles, every kind of harness trimmings, foot rules, chessmen, handles of knives and forks, pencil cases, jewelry of all kinds, pocket-books, mouth-pieces for pipes, cigar-holders, musical instruments, doll heads, porcelain imitations, hat bands, neckties, optical goods, shoe tips and insoles, thimbles, emery wheels, shirt cuffs, collars, etc. Its use as a substitute for ivory has already exercised a world-wide effect upon the ivory industry, the falling off in the demand having been felt in the remotest regions of Africa. It has lately been introduced as a substitute for linen or paper in the making of shirt cuffs, collars, etc. It has the appearance of well-starched linen, is sufficiently light and flexible, does not wrinkle, is not affected by perspiration, and can be worn for months without injury. It becomes soiled much less readily than linen, and when dirty is quickly cleaned by the application of a little soap and water with a sponge or rag.

THE RUSSIAN THIRTY-TWO-INCH OBJECTIVE. A contract, it is said, has been made by Alvan Clark & Sons, of Cambridgeport, Mass., with the Russian government, relative to the great objective for the Imperial Observatory at Pulkowa, for a great telescopic objective. The proposed glass is to be the largest in the world. The contract provides that the definition of the glass shall not be inferior to that of the telescope in the Naval Observatory in Washington, and that the amount of light shall be greater in proportion to the increased area of the objective, allowance being made for the absorption of light by the glass. The objective at Washington is 26 inches in diameter; the proposed glass is to be from 31½ to 32 inches in diameter, with a clear aperture of 30 inches. Three years and a half are allowed for its completion—two years to procure the rough disks, and 18 months for grinding, polishing, correcting, etc., with an extension of time, provided good and sufficient reasons are given for the failure to finish within the specified period. When finished the glass will be mounted in Hamburg. The cost of the glass alone will be $32,000. The material for the glasses will probably be furnished by French manufacturers, the Clarks finding them the most trustworthy.

TRAVELING STONES.—Many of our readers have doubtless heard of the famous traveling stones of Australia. Similar curiosities have recently been found in Nevada, which are described as almost perfectly round, the majority of them as large as a walnut, and of an irony nature. When distributed about upon the floor, table, or other level surface, within two or three feet of each other, they immediately begin traveling toward a common center, and there lie huddled up in a bunch like a lot of eggs in a nest. A single stone, removed to a distance of three and a half feet, upon being released, at once started off, with wonderful and somewhat comical celerity, to join its fellows; taken away four or five feet, it remained motionless. They are found in a region that is comparatively level, and is nothing but bare rock. Scattered over this barren region are little basins, from a few feet to a rod or two in diameter, and it is in the bottom of those that the rolling stones are found. They are from the size of a pea to five or six inches in diameter. The cause of these stones rolling together is doubtless to be found in the material of which they are composed, which appears to be loadstone or magnetic iron ore.—*Virginia City Enterprise.*

CARBON IN COMETS.—It is generally believed that some compound of carbon exists in comets, and it has been assumed that the bright lines in the spectra of these bodies were due to that compound being in an incandescent state. G. J. Stoney has advanced another hypothesis. He suggests that the bright lines are caused by the light of the sun falling on the compound of carbon and rendering it visible in the same way that light renders the moon, the planets, and other opaque objects visible, the vapor of carbon being opaque to the particular rays which appear as bright lines in its spectrum.

CURRENTS OF AMPERE.—Ampere asked if the molecular currents of magnets are entirely created in the magnetic substance during magnetization, or if the magnetizing cause merely determines a circulation of currents pre-existing in the metals in their natural state. He inclined to the latter opinion. The author thinks that there is every reason to admit, with Ampere, that the particular currents pre-exist in the magnetic metals, and that the current of the battery merely determines the circulation and the direction.—*M. Treve, in Comptes Rendus.*

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Oct. 2.		Week Ending Oct. 9.		Week Ending Oct. 15.		Week Ending Oct. 23.	
Alpha	17¾	14½	17¾	16	16¾	15½	15⅝	14½
Alta	6	5½	5½	6	6	5	6⅛	5½
Andes	1.20	95c	1.20	1.05	1.30	1	1.15	1
Alps	....	....	....	....	....	....	....	....
Argenta	1.60	90c	85c	75c	1.05	75c	1	80c
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	....	....	....	....	10c	....	....	....
Baltimore Con	....	....	....	....	....	....	....	....
Belcher	4⅜	3.60	3.85	3.65	4.60	3.65	4	3⅝
Belmont	65c	60c	65c	50c	1.10	50c	1.30	80c
Best & Belcher	18⅜	17¼	17½	16⅞	19¾	17½	18½	17⅛
Bullion	8¼	7⅛	10	8	8⅝	7½	7⅛	7
Bechtel	1½	1	1.15	1	1½	1⅛	1⅛	1½
Belle Isle	5⅜	4.85	4.95	4.05	4.65	4.10	4½	4½
Bodie	14	13½	13½	10½	13	12⅝	13⅝	12⅛
Benton	3.40	2⅜	3	2.85	3½	2⅞	4.10	3.15
Bulwer	12	11½	11½	11	12	11½	11¾	11½
Boyle	....	....	....	....	....	....	....	....
Black Hawk	1	75c	1.10	75c	95c	75c	80c	55c
Belvidere	85c	80c	1⅛	80c	85c	50c	75c	....
Booker	1	95c	80c	55c	90c	60c	80c	65c
Caledonia	2⅝	2	2.40	2.15	2½	2.20	2.65	2.30
California	5⅜	5¼	5⅝	5¼	6¼	5	5⅝	5¼
Challenge	2.30	2.10	2½	2.10	2.40	2	2.20	2
Chollar	7⅛	6⅜	7	6⅜	7¾	6⅝	7	6⅜
Confidence	10½	9	10	9	10½	9½	10	9
Con Imperial	1.35	1.20	1.30	1.20	1½	1.05	1.15	1.05
Con Virginia	5½	5¼	5⅝	5¼	6¾	5	5⅞	5½
Crown Point	4.30	3⅞	4.20	4	4.45	4.10	4.10	3.90
Con Washoe	....	....	....	....	....	....	....	....
Champion	40c	30c	30c	25c	25c	20c	25c	15c
Concordia	20c	....	....	....	....	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	1½	55c	1.30	1.10	1.15	70c	1½	75c
Eureka Con	26	22⅝	25½	24½	28	20	26⅝	24
Exchequer	6⅛	5	6¼	5¼	6	5¼	5⅝	5
Endowment	55c	35c	50c	....	55c	50c	50c	40c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	2.55	2	2.10	2	2.20	2	2⅜	2
Gila	25c	15c	25c	20c	30c	25c	30c	15c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	13	12	13	....	12½	12	11⅞	....
Goodshaw	40c	25c	30c	20c	35c	30c	40c	35c
Gould & Curry	11⅜	9⅞	10½	9¼	12	10	10½	9⅞
Hale & Norcross	13½	11⅛	12¾	11½	15⅞	13¼	14⅝	13½
Hillside	1.85	1¾	2	1¾	1.90	1¾	1.90	1.85
Highbridge	....	....	....	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	15c	....	15c	10c	15c	....	15c	....
Independence	2	1¾	1⅝	1.55	1¾	1½	1.70	1½
Julia	4½	3¾	4.05	3.80	4.10	3¾	3.95	3½
Justice	3¼	3.20	3.30	3.05	3¼	3.10	3.20	2.85
Jackson	3.90	....	4½	4	4	....	4	3½
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	1	....	....	....	....	....
Kentuck	1.30	4.20	4.15	4	4.40	4	4	3.95
Kossuth	....	....	....	....	....	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	1	70c	1	75c	90c	75c	80c	60c
Lady Wash	1.05	99c	1	85c	1.10	20c	1.20	1
Leopard	60c	55c	60c	....	55c	50c	55c	50c
Leviathan	60c	45c	60c	50c	60c	55c	60c	50c
Leeds	65c	....	60c	....	....	....	55c	50c
Lee	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	25c	....
Modoc	1¼	1.20	1	....	1	90c	....	....
Manhattan	3	....	2⅜	2¼	2⅜	....	2⅜	....
Martin White	2	1.90	2	1½	1⅜	1⅜	1⅜	1½
McClinton	65c	60c	65c	60c	65c	30c	35c	....
Meadow Valley	5c	....	5c	....	5c	....	....	....
Mexican	37	31	32⅜	31½	43⅜	32½	36½	34
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	3	....	....	....	....	....
North Con Virginia	9	8	9½	8	9½	....	....	....
New York	60c	45c	55c	40c	60c	40c	60c	35c
Northern Belle	3.95	3⅜	3⅜	3½	4	3.60	5⅜	4⅜
New Coso	....	....	....	....	....	....	....	....
Navajo	40c	30c	50c	35c	65c	40c	50c	35c
Occidental	3¼	2.10	2⅜	2.30	2½	2¼	2½	2¼
Ophir	43½	36	36½	33	38½	34½	36	32
Oriental	15c	....	15c	10c	40c	10c	40c	35c
Overman	9⅝	8⅝	9½	9	9⅝	9	9⅝	9
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	....	....	....	....
Phil Sheridan	40c	....	25c	20c	60c	20c	60c	35c
Potosi	6	5½	6¼	5⅜	6⅜	5⅝	5⅞	5⅛
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	1¼	1.10	1¼	1.10	1¼	1.15	1¼	1.20
Richer	....	....	....	....	25c	....	25c	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	14⅛	12	12⅝	11⅞	14⅞	12½	13	11½
Seg Belcher	22	....	....	....	....	....	....	....
Sierra Nevada	49	42⅞	49½	47	86½	50	64½	56
Silver Hill	1½	1¼	1½	1¼	2	1.30	1.40	1.20
Silver King	6	5⅞	6	5	6	....	6⅝	6
Silver Prize	....	....	....	....	....	....	....	....
Succor	....	....	....	....	....	....	25c	20c
Summit	1⅜	1¼	1¼	1¼	1.60	1¼	1.55	1.40
Scorpion	3.60	3.10	3.60	3.30	6⅜	3.40	5½	4⅞
Solid Silver	50c	30c	30c	....	30c	15c	25c	20c
South Bodie	25c	20c	25c	20c	20c	....	15c	....
South Standard	10c	5c	....	....	20c	....	10c	....
Star	75c	50c	70c	60c	65c	50c	60c	55c
St. Louis	....	....	30c	....	....	....	....	....
Syndicate	5½	5	5	....	6½	4.90	7	5⅞
Tioga Con	3.05	2⅞	2⅞	2.60	3¼	2.60	3.60	3¼
Tiptop	1¼	1.10	1.20	1.10	1¼	1.10	1.30	1.20
Trojan	30c	20c	20c	15c	20c	15c	20c	15c
Union Con	72½	61	67⅞	64	94	70	76	69
Utah	20½	17½	20⅞	19½	27½	20½	25	21⅛
Vermont Con	....	....	....	....	....	....	....	....
Ward	3¼	2.90	3	2.70	2.85	2.65	2⅜	2½
Wells-Fargo	5c	....	....	....	20c	10c	20c	10c
Woodville	....	....	40c	....	40c	30c	30c	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	16½	15	16	15	17	15½	15½	14½

Sales at S. F. Stock Exchange.

Friday A. M., Oct. 17.
95 Alpha....15½@15½
180 Alta....5⅝@5½
410 Andes....1.15@1.10
200 Belcher....3.80
405 Benton....3¼@3.15
805 Bullion....7½
10 Best & Belcher....17⅛
410 California....5⅝@5½
425 Con Virginia....5⅝@5⅜
195 Chollar....7@6¾
1460 Con Imperial..1.05@1.10
35 Crown Point....4
70 Confidence....9½
50 C Dorado....3¼
85 Challenge....2.20@2.10
160 Caledonia....2.60@2½
100 C P Ravine....20c
350 Exchequer....5⅝@5⅛
100 Fairfax....80c
400 Flowery....55@50c
185 Gould & Curry...10½@10⅝
1355 Golden Gate....2⅛@2⅜
195 Hale & Nor....14@13⅞
320 Julia....3.95@3.90
185 Justice....3¼@3.20
180 Kentuck....4
580 Lady Wash....1.15
100 Leviathan....60c
400 Lady Bryan....60@75c
200 Mt View....2.80@2⅞
1705 Mexican....36@35⅞
20 Mackey....90c
150 New York....50c
565 N Bonanza....1½
670 Ophir....36@35
60 Occidental....2.40
65 Overman....9¼@9
2610 Phil Sheridan....60@35c
270 Potosi....5⅞
55 Savage....12⅞@13
200 Succor....20c
600 Senator....20@25c
300 Solid Silver....25c
630 Silver Hill....1.40@1¼
960 Sierra Nevada....63@64½
425 Scorpion....5¼@5⅜
1450 Trojan....15c
185 Utah....24¼@24½
705 Union Con....75@76
4500 Wells Fargo....20c
400 Ward....2.70@2⅞
150 Woodville....30c
440 Yellow Jacket....15@15½

AFTERNOON SESSION.
170 Argenta....85c
100 Adenda....50c
150 Boston....1.40@1.30
100 Bulwer....11¼
45 Belvidere....75c
220 Black Hawk....80@75c
275 Booker....80@75c
610 Belmont....1.20@1.30
1060 Belle Isle....4½@4.35
190 Bodie....12½@12½
1700 Big Prize....35c
1005 Bechtel....1.40@1½
750 Champion....15@20c
170 C Pacific....7½@7⅞
300 Crœsus....15c
1000 Day....75@80c
30 Eureka Con....25
200 Endowment....50c
300 Gila....30@25c
285 Grand Prize....2½@2
550 Goodshaw....35c
200 Hamburg....5c
330 Independence..1.70@1.60
20 Jackson....3½
250 Jupiter....90c
510 Leopard....55c
50 Leeds....50c
200 Metallic....75c
405 Mt Diablo....8@8½
150 McClinton....35c
125 May Belle....25c
50 Mono....6¼@6½
100 Mammoth....7⅝
225 Martin White...1½@1.60
775 Navajo....40@35c
565 Northern Belle....5⅝@5¼
1400 N Belle Is....30c
495 N Noonday....3.90
1360 Noonday....3@3.10
250 Oriental....40@35c
200 Paradise....1¼
550 Queen Bee....15@10c
120 Ray'd & Ely....1.20@1¼
100 Richor....25c
340 Summit....1½
355 Syndicate....7@6⅞
240 S Bulwer....45c
5 Silver King....6
210 Tioga Con....3¼@3.60
950 Tiptop....1¼
30 University....25c

Saturday A. M., Oct. 18.
125 Alta....5⅝@5½
125 Alpha....15⅜
160 Andes....1.10@1.05
895 Argenta....80@95c
175 Best & Belcher....18
100 Belcher....3.60@3.90
705 Bullion....7½@7½
410 Benton....3⅞@3.70
1200 Belmont....1¼
1330 Belle Isle....4.35@4½
120 Bodie....12½@12½
1270 Bechtel....1.45@1½
300 Boston....1.30
1450 Big Prize....35c
100 Booker....70c
200 Bulwer....11½@11½
210 Black Hawk....60@55c
320 California....5½@5¼
150 Con Virginia....5⅜@5½
240 Chollar....6⅞@6⅝
1390 Con Imperial..1.05@1.15
120 Crown Point....4
50 Confidence....9
465 Caledonia....2.40@2.65
60 Challenge....2.10@2.20
350 Con Dorado....3
115 C Pacific....7½@7½
1485 Day....80@90c
100 D Standard....35c
30 Dudley....90c
550 Exchequer....5¼@5
110 Eureka Con....26@26½
260 Fairfax....70@80c
2155 Flowery....55@50c
225 Gould & Curry...10⅞@10⅛
900 Golden Gate....2½
100 Grand Prize....2.60@2½
275 H & Norcross....14⅜@14½
400 Independence..1.60@1.70
165 Justice....3@3.05
340 Julia....3.80@3.65
40 Jupiter....1
50 Kentuck....3.95@4
830 Lady Bryan....75@70c
150 Leviathan....55@50c
220 Lady Wash....1.20@1.15
670 Leopard....55c
1260 Mexican....35½@36½
200 Metallic....80c
140 Mount View...2.80@2.85
100 Mackey....1
450 M White....1.60
220 Mammoth....7½
500 Mt Diablo....9@9½
220 Mono....6¼@6
570 New York....60@50c
250 Navajo....40c
920 N Bonanza....1.35@1.45
240 Northern Belle....5¼@5½
190 Noonday....3.10@3
1000 N Belle Is....25@20c
400 N Noonday....3.90
800 Ophir....35½@34½
80 Overman....9⅝@9⅝
230 Occidental....2½
820 Oriental....40c
350 Potosi....5⅞@5⅞
1090 Phil Sheridan....50@45c
150 Paradise....1½
150 Raymond & Ely....1½
65 Savage....12⅝
50 Succor....20c
1585 Sierra Nevada....60@5
800 Senator....20c
125 Silver Hill....1¼@1.35
865 Scorpion....4⅞@4.90
50 Summit....1.40
100 Syndicate....7
100 S Standard....10c
2000 Trojan....16c
200 Tuscarora....45@40c
700 Tioga....3⅛@3.60
50 Tiptop....1.30
195 Utah....23½@23½
965 Union Con....72@65
100 University....25c
3650 Wells-Fargo....15@20c
580 Ward....2.60
325 Wales....10
225 Yellow Jacket....15⅛@16

Monday A. M., Oct. 20.
185 Alta....6⅛@6
130 Alpha....14½@14½
150 Belcher....3.90
320 Bullion....7½@7⅞
90 Best & Belcher...17⅞@17½
235 Benton....4@3.85
135 Con Virginia....5½@5⅝
280 Chollar....7@6¾
115 California....5½
3065 Con Imperial..1.05@1.10
85 Confidence....9½
100 Challenge....2.10@2
265 Caledonia....2.55@2½
1250 C Dorado....3
235 Crown Point....4@3.90
390 Exchequer....5½@5
100 Flowery....50c
870 Golden Gate....2¼@2½
255 Gould & Curry...10½@10½
320 Hale & Nor....14½@14
95 Julia....3⅞@3.80
220 Justice....3@3.05
40 Kentuck....4
120 Lady Bryan....75@80c
580 Lady Wash....1.15@1.20
1365 Mexican....36½@36
100 Mackey....45c
140 Mt View....2.80@2⅞
380 N Bonanza....1.40@1.45
45 New York....50c
80 Occidental....2.40
200 Ophir....34@34½
80 Overman....9⅝@9⅝
820 Phil Sheridan....50@55c
100 Senator....20c
125 Silver Hill....1.30
330 Savage....12½
1610 Sierra Nevada...59½@62½
820 Scorpion....5½@5
200 Trojan....15c
105 Utah....25@24½
1115 Union Con....75½@74½
1800 Wells-Fargo....15c
275 Ward....2.60
250 Yellow Jacket....15@14½

AFTERNOON SESSION.
1460 Argenta....1
500 Albion....20c
1590 Belle Isle....4½@4.35
2500 Big Prize....35c
395 Bodie....13@12½
1875 Bechtel....1.40@1½
200 Bulwer....11½
140 Booker....75@65c
275 Black Hawk....70@60c
1150 Boston....1.40@1½
175 C Pacific....7½@7½
1360 Day....1@1.10
225 Dudley....90c
130 Eureka Con....25@25½
250 Endowment....50@40c
45 Grand Prize...2.60@2.65
325 Gila....25@30c
100 Goodshaw....40c
265 Independence .1.60@1.65
550 Jupiter....1.30@1½
450 Leopard....55@50c
550 Metallic....80@75c
60 Manhattan....2⅞
50 Mt Diablo....9⅝
20 Mono....6
400 Mammoth....7@6⅞
440 M White....1.70
420 Navajo....40@35c
75 Northern Belle....5⅜@5½
700 N Belle Is....25c
115 Noonday....2.90@3
120 N Noonday....3⅞@3½
340 Oriental....40c
270 Paradise....1½
1330 Raymond & E....1¼@1.20
100 Star....55c
115 Syndicate....6⅞@6½
160 Summit....1½
250 S Bulwer....45c
180 Silver King....6@6½
1650 Tuscarora....40c
70 Tioga Con....3.40
900 Tiptop....1.20
150 University....25c

Tuesday A. M., Oct. 21.
170 Alpha....14⅞@15
175 Alta....5⅝@5⅜
630 Andes....1.05@1
170 Bullion....7½@7⅞
115 Belcher....3.95@4
15 Best & Belcher....17⅞@18
520 Benton....4@4.10
365 California....5½@5⅝
30 Confidence....9⅝
1520 Con Imperial..1.15@1.10
640 Crown Point....4@4.10
35 Challenge....2
180 Caledonia....2½
175 Con Virginia....5⅝
120 Chollar....6⅞@6⅞
1930 Con Dorado....3@2⅞
385 Exchequer....5⅛@5¼
200 Fairfax....70c
200 Flowery....50c
150 Gould & Curry....10½@10
1070 Golden Gate....2¼@2½
165 H & Norcross....13⅞@14⅜
50 Julia....3.70@3.60
130 Justice....3@3.05
50 Kentuck....4
50 Leviathan....50c
45 L Bryan....80@75c
540 Lady Wash....1.15@1.20
1115 Mexican....35½@35½
475 Mackey....70c
200 Mt View....2.60@2½
600 N Bonanza....1¼@1.10
330 New York....50c
285 Ophir....34@34½
45 Overman....9
80 Occidental....2½
520 Potosi....5½@5⅝
820 Phil Sheridan....55c
295 Scorpion....5¼@5⅝
410 Savage....12
295 Silver Hill....1.30
905 Sierra Nevada....62@61
200 S Utah....10c
225 Utah....24@24½
1670 Union Con....75@74
1500 Wells-Fargo....15@10c
255 Yellow Jacket...14⅞@14½

AFTERNOON SESSION.
400 Albion....20c
700 Argenta....90c
100 Atlas....40c
340 Boston....1.30@1.45
775 Belle Isle....4⅞@4.40
150 Black Hawk....60c
250 Booker....80c
230 Bulwer....11½@11⅝
950 Big Prize....30c
130 Bodie....13
640 Bechtel....1.40@1½
500 Champion....25c
70 C Pacific....7½
1600 Day....1¼@1.20
200 Eureka Con....25@24⅞
160 Grand Prize....2.60
400 Gila....15c
150 Goodshaw....40c
100 Hussey....15c
135 Hillside....1.85@1.90
200 Independence....1.60@1½
15 Jackson....3⅞
870 Jupiter....1½
800 Leopard....50c
50 Leeds....55c
45 Mono....6@5⅞
905 Martin White....1⅞
100 Manhattan....2⅞
100 Metallic....80c
120 Mammoth....6½
300 Mt Diablo....9½@9
700 N Belle Is....25@30c
150 Noonday....3
910 N Noonday....3½@3.55
635 Northern Belle....4⅞@4½
1100 Navajo....40c
500 Oriental....40@35c
300 Orient....25c
50 Paradise....1½
400 Queen Bee....25@20c
300 Raymond & Ely....1.20
100 Star....60c
100 Syndicate....6¼
275 Silver King....6¼@6⅞
250 S Bodie....15c
100 S Bulwer....40c
185 Summit....1½@1.55
70 Tioga....3¼
850 Tuscarora....60@45c
450 Tiptop....1¼
100 University....25c
30 Wales....10

Wed'sday A. M., Oct. 22.
55 Alpha....14⅞@15
70 Alta....5⅞
550 Andes....1.05@1.10
40 Bullion....7½@7⅞
60 Belcher....3⅞@3.80
390 Benton....4@3.95
30 Best & Belcher....18½@18
110 California....5⅝
10 Confidence....9½
1105 Con Imperial....1.10
100 Crown Point....4
10 Challenge....2
345 Caledonia....2½@2.45
60 Con Virginia....5⅝
220 Chollar....6⅞
1210 Con Dorado....2½@2⅞
270 Exchequer....5⅛@5¼
100 Fairfax....70c
1165 Golden Gate....2
60 Gould & Curry...10½@10½
110 Hale & Nor....13⅞@13½
250 Justice....3@3.05
225 Julia....3½
200 Leviathan....55c
655 Lady Wash....1.15
315 Lady Bryan....80@75c
50 Mountain View....2.60
275 Mexican....34
530 Mackey....60@45c
250 New York....50c
170 N Bonanza....1¼@1.30
35 Overman....9½
160 Ophir....33@32⅞
150 Occidental....2¼
270 Potosi....5⅛
800 Phil Sheridan....55@50c
100 Plutus....2.40
275 Savage....11½@11½
100 S Utah....15c
645 Sierra Nevada....57@57½
170 Silver Hill....1¼
30 Solid Silver....20c
265 Scorpion....5½@5½
700 Trojan....15@20c
300 Utah....23@22
645 Union Con....70@71½
1150 Wells-Fargo....10c
110 Ward....2½@2.60
140 Yellow Jacket....14⅞

AFTERNOON SESSION.
200 Atlas....50c
400 Albion....15@20c
410 Argenta....95c@1
900 Big Prize....40c
60 Bodie....13½
405 Bechtel....1.45@1½
315 Booker....80@70c
700 Belmont....85@80c
1700 Boston....1.40@1.45
1220 Belle Isle....4⅞@4.45
100 Bulwer....11⅞
430 Black Hawk....60@65c
140 Champion....20c
100 Caledonia (B H)....2.10
100 C Pacific....7½
250 Day....95c@1
190 Dudley....90@80c
120 Eureka Con....24@24⅞
400 Endowment....50c
790 Goodshaw....40@35c
50 Golden Terra....11⅞
145 Grand Prize....2.60@2.55
775 Gila....25c
500 Hussey....15c
100 Hillside....1.85
270 Independence..1.60@1.55
50 Jackson....4
690 Jupiter....2
200 Martin White....1⅞@1.70
470 Mt Diablo....8½@9
100 Mono....5⅞
290 Mammoth....6½@6⅞
300 Navajo....45@50c
2050 N Belle Is....25@30c
205 Northern Belle....5
250 N Noonday....3.65@3⅞
550 Oriental....35@40c
50 Orient....30c
100 Paradise....1½
410 Raymond & E...1.20@1¼
50 S Bulwer....45c
100 S Bodie....15c
260 Silver King....6½@6⅞
35 Summit....1½
95 Syndicate....6@5⅞
100 Star....60c
480 Tioga Con....3¼@3.30
915 Tiptop....1⅜@1.30
1400 Tuscarora....55@60c
350 University....25@30c
10 Wales....10

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Argonaut M & M Co	California	2	10	Oct 7	Nov 15	Dec 8	J L Fields	240 Montgomery st
Bechtel Con M Co	California	3	15	Oct 1	Nov 5	Nov 25	W H Lent	309 Montgomery st
Benton Con M Co	Nevada	2	50	Sept 17	Oct 22	Nov 10	W H Watson	302 Montgomery st
Champion M Co	California	4	20	Oct 15	Nov 20	Dec 9	Jno Crockett	203 Bush st
Gila S M Co	Nevada	5	25	Sept 30	Nov 3	Nov 24	W W Parrish	328 Montgomery st
Grand Prize M Co	Nevada	2	50	Sept 17	Oct 21	Nov 11	J E Dixon	20 S F Stock Ex
Hale & Norcross S M Co	Nevada	62	1 00	Sept 9	Oct 14	Nov 4	J F Lightner	58 Nevada Block
Jupiter M Co	California	5	30	Sept 18	Oct 21	Nov 10	E C Masten	22 Nevada Block
K K Con M Co	Nevada	9	2 00	Oct 3	Nov 5	Dec 3	B B Minor	309 Montgomery st
Mexican G & S M Co	Nevada	8	1 50	Sept 11	Oct 15	Nov 6	C L McCoy	203 Bush st
Mono G M Co	California	5	1 00	Sept 4	Oct 9	Oct 29	W H Lent	309 Montgomery st
Murchie G & S M Co	California	2	25	Oct 9	Nov 8	Dec 8	S D Rogers	328 Montgomery st
New York M Co	Nevada	20	30	Oct 22	Nov 24	Dec 16	D L Thomas	203 Bush st
Potosi M Co	Nevada	1	50	Aug 29	Oct 7	Oct 28	W E Dean	203 Bush st
Real Del Monte M Co	Nevada	8	1 00	Sept 18	Oct 20	Nov 29	C V Hubbard	203 Bush st
Rough & Ready Con G M Co	California	1	05	Oct 15	Nov 19	Dec 9	W H Lent	309 Montgomery st
Savage M Co	Nevada	39	1 00	Sept 22	Oct 31	Nov 20	E B Holmes	309 Montgomery st
Silver Hill M Co	Nevada	8	50	Oct 16	Nov 19	Dec 11	W E Dean	203 Bush st
Solid Silver G & S M Co	Nevada	2	25	Oct 6	Nov 10	Dec 8	J J Applegate	320 Sansome st
South Standard M Co	California	5	15	Sept 11	Oct 15	Nov 3	C A Sankey	331 Montgomery st
Succor M & M Co	Nevada	24	25	Aug 30	Oct 13	Nov 3	Wm H Watson	302 Montgomery st
Tioga Con M Co	California	7	30	Sept 10	Oct 15	Nov 1	W H Lent	62 Nevada Block
Utah S M Co	Nevada	27	2 00	Oct 22	Nov 25	Dec 13	G C Pratt	309 Montgomery st
Yellow Jacket S M Co	Nevada	24	1 00	Oct 13	Nov 18	Dec 18	Mercer Otey	Gold Hill, Nevada

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Hydraulic Grav M Co	California	1	20	Oct 2	Nov 10	Dec 13	James Ireland	216 Sansome st
Butte Creek Hyd M Co	California	3	15	Sept 18	Oct 20	Nov 5	R L Taylor	310 Pine st
Dardanelles M Co	Nevada	7	50	Sept 9	Oct 10	Oct 27	H C Hinman	411 California st
De Haro M Co	Nevada	2	10	Sept 24	Oct 27	Nov 12	W W Bausman	409 California st
Double Standard G M Co	California	1	10	Sept 13	Oct 21	Nov 11	W H Lent	309 Montgomery st
Diana G & S M Co	Nevada	4	10	Sept 24	Oct 23	Nov 15	J T McGeoghan	318 Pine st
Equitable Tunnel & M Co	Utah	21	10	Sept 16	Oct 21	Nov 14	C J Collins	227 Montgomery st
Geo Douglas M Co	Nevada	3	10	Sept 24	Oct 27	Nov 13	W W Bausman	409 California st
Hamburg M Co	Nevada	1	1 00	Sept 19	Oct 21	Nov 10	D A Jenning	401 California st
Joe Scates Con S M Co	Nevada	4	10	Sept 24	Oct 27	Nov 13	W W Bausman	409 California st
J & K G M Co	California	1	15	Sept 29	Nov 3	Nov 24	W H Lent	309 Montgomery st
Mammoth Grove M Co	California	1	02	Oct 9	Nov 13	Nov 29	A B Paul	328 Montgomery st
Maybelle Con M Co	California	3	10	Sept 6	Oct 15	Nov 10	A W Fox	310 Pine st
Mayflower G M Co	California	6	10	Oct 9	Nov 12	Dec 9	J Morizio	328 Montgomery st
McClinton M Co	California	4	25	Oct 10	Nov 14	Dec 4	W H Lent	309 Montgomery st
Meadow Valley M Co	Nevada	15	25	Sept 12	Nov 12	Dec 8	T W Colburn	414 California st
Mono and Cross Con M Co	California	1	10	Oct 8	Nov 12	Nov 29	J M Buffington	309 California st
Monte Cristo Con M Co	California	1	10	Oct 3	Nov 17	Dec 15	Butler Burris	309 Montgomery st
Mt Hood M Co	Nevada	3	10	Sept 24	Oct 27	Nov 13	W W Bausman	409 California st
Nob Hill G & S M Co	California	1	15	Oct 6	Nov 10	Nov 28	J H Sayro	330 Pine st
North Scorpion M Co	Nevada	1	10	Aug 11	Nov 3	Nov 20	T B Ludlum	211 Sansome st
Numa M Co	Nevada	2	02	Oct 23	Nov 24	Dec 15	D Wilder	328 Montgomery st
Orion M Co	California	5	30	Oct 9	Nov 10	Nov 25	P Conklin	28 Sansome st
Quartz Mountain G M Co	California	7	50	Sept 20	Oct 27	Nov 17	E Hestres	729 Montgomery st
Sabine M Co	Nevada	2	10	Sept 24	Oct 27	Nov 12	W W Bausman	409 California st
San Xavier M & S Co	Arizona	1	25	Oct 14	Nov 17	Dec 8	F A McGee	32 Merchants' Ex
South Comstock G & S M Co	Nevada	6	25	Sept 9	Oct 13	Nov 3	J M Buffington	309 California st
Tolo M Co	Nevada	2	10	Sept 24	Oct 27	Nov 12	W W Bausman	409 California st
Vancouver M Co	Nevada	3	10	Sept 24	Oct 27	Nov 13	W W Bausman	409 California st
Wide Awake P & M Co	Arizona	8	03	Oct 11	Nov 11	Dec 11	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Con Dorado M Co	California	J McDougall	309 California st	Annual	Oct 28
McClinton M Co	California	W H Lent	309 Montgomery st	Annual	Nov 4
North Noonday	California	A W Fox	310 Pine st	Annual	Nov 4
Occidental Con G M Co	California	W T Smith	402 Montgomery st	Annual	Nov 1
Real del Monte M Co	California	C V Hubbard	203 Bush st	Annual	Nov 6
Western M Co	California	C S Curtiss	203 Bush st	Annual	Nov 3

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Belle Isle M Co	Nevada	John E Dixon	Stock Exchange	75	Oct 6
Bodie Con M Co	California	W H Lent	Nevada Block	50	Oct 1
California M Co	Nevada	C P Gordon	23 Nevada Block	60	Aug 17
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	60	Aug 16
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	2 00	Oct 20
Independence M Co	Nevada	John E Dixon	Stock Exchange	25	Aug 21
Indian Queen M & M Co	———	A K Durbrow	69 Nevada Block	20	Aug 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	July 26
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	30	July 28
Montezuma M & M Co	———	J T McGeoghegan	318 Pine st	25	Aug 12
Pioneer M Co	California	J W Pew	310 Pine st	08	October 6
Standard Con M Co	California	Wm Willis	309 Montgomery st	50	Oct 13

SALES OF LAST WEEK AND THIS COMPARED

Thursday A.M., Oct. 16.
145 Alpha....17@16⅞
805 Alta....5⅞@6
425 Andes....1.20@1.30
770 Benton....3½@3⅞
225 Best & Belcher....18
270 Belcher....4.20@4
455 Bullion....7⅝@7½
325 California....5⅞
288 Con Virginia....6⅛@6
450 Chollar....7@7¼
35 Crown Point...4.35@4.30
1695 Con Imperial..1.10@1.05
40 Confidence....10
560 Caledonia....2½
25 Challenge....2
1150 C Dorado....2.80@3¼
330 Exchequer....5½@5⅝
200 Fairfax....75c
290 Flowery....55@50c
345 Gould & Curry...10½@10½
1430 Golden Gate....2⅞@2.65
185 Hale & Nor....14
450 Justice....3¼@3.20
80 Julia....4@4.10
70 Kentuck....4
260 Lady Wash....20c
310 L Bryan....80c
915 Mexican....38@38½
100 Mackey....75c@1
230 Mt View....2⅞@2.90
895 New York....50@45c
495 N Bonanza....1½@1.55
325 Ophir....36½@36½
220 Overman....9½@9
135 Occidental....2½
1255 Phil Sheridan....60@50c
310 Potosi....5⅞@6
200 Plutus....2.45
80 Scorpion....5½
80 Savage....12⅞
345 Silver Hill....1.65
1850 Sierra Nevada....69@64
100 Senator....20c
375 Solid Silver....30c
200 Trojan....15c
355 Utah....23@25
1715 Union Con....77@82
350 Ward....2.80@2⅞
2600 Wells-Fargo....20c
235 Yellow Jacket....15½

AFTERNOON SESSION.
350 Albion....15c
260 Adenda....45c
275 Argenta....80c
350 Boston....1.40@1.35
990 Belmont....1@1.05
100 Black Hawk....60c
50 Booker....75c
100 Belvidere....75c
30 Bulwer....11.55@11
610 Belle Isle....4½@4.30
450 Big Prize....30c
195 Bodie....12⅝@12½
1770 Bechtel....1½
300 Champion....10c
50 Dudley....90c
200 D Standard....20c
1150 Day....75@85c
115 Eureka Con....24⅞@24⅞
100 Endowment....50c
280 Grand Prize....2⅜
300 Golden Terra....12
1050 Goodshaw....50c
335 Hussey....20c
110 Independence .1.60@1.55
1100 Jupiter....2 40@2½
15 Jackson....4
200 Mt Diablo....9
330 Mono....5⅞@5⅞
200 Modoc....5c
685 M White....1⅞
50 Mammoth....6@6½
200 Metallic....80@75c
130 Northern Belle....5⅞
150 Navajo....45@40c
1900 N Noonday....3⅞@3.60
300 N Belle Is....25c
900 Oriental....40@35c
10 Paradise....1½
100 Queen Bee....20c
150 Real del Monte....3
600 Raymond & E....1¼
200 S Bulwer....40c
100 Syndicate....6½
10 Summit....1½
20 Star....60c
200 S Bodie....10c
20 Silver King....6½
8200 Tuscarora....60c@1
350 Tiptop....1.40@1.30
425 Tioga Con....3.35@3½
50 University....25c

Thursd'y A. M., Oct. 23.
150 Alpha....14⅞
80 Alta....5½@5⅝
460 Andes....1.10@1.05
90 B & Belcher....17⅞@17½
40 Belcher....3.90
425 Bullion....7@7½
480 Benton....3.60
360 California....5⅝@5½
600 Con Virginia....5⅝@5½
190 Chollar....6⅞@6⅝
35 Crown Point....3.90
260 Con Imperial....1.10
125 Confidence....10
200 Caledonia....2.30@2.35
290 Challenge....2@2.10
950 C Dorado....2.70@2½
250 Exchequer....5@5⅛
100 Fairfax....75c
75 Gould & Curry....9⅞@9⅞
840 Golden Gate....2
45 Hale & Nor....13½
35 Julia....3.60@3⅞
70 Justice....2.90@2.85
1400 Lady Bryan....75@80c
750 Leviathan....55c
265 Lady Wash....1.10@1
390 Mexican....34@34½
390 Mackey....60c
505 New York....45@35c
100 North Carson....10c
490 N Bonanza....1¼@1.30
315 Ophir....33@32
370 Occidental....2.40@2½
215 Potosi....5⅛@5½
200 Phil Sheridan....40c
95 Savage....12⅞
715 Sierra Nevada...57½@58⅞
370 Silver Hill....1¼@1.20
3220 Succor....25c
535 Scorpion....5⅛@5
200 S Utah....15c
200 Trojan....15c
50 Utah....22@21½
1175 Union....74@75
2200 Wells-Fargo....10c
85 Yellow Jacket...14⅝@14⅞

AFTERNOON SESSION.
1435 Argenta....95c@1
400 Addenda....40c
200 Albion....15c
270 Atlas....50c
30 Bulwer....11¼
90 Bodie....13½@13½
840 Bechtel....1.40@1.45
400 Black Hawk....75c
500 Boston....1.40@1½
600 Big Prize....30c
100 Booker....75@70c
1650 Belmont....90@75c
1195 Belle Isle....4.30
70 C Pacific....7½@7⅞
250 Caledonia (B H)....2.10
2150 Champion....15@25c
100 Caledonia (B H)....2¼
100 C Pacific....7½@7⅞
120 Dudley....1
670 Day....75@70c
235 Eureka Con....26½@25½
75 Endowment....50c
260 Grand Prize....2.40@2½
200 Goodshaw....35c
350 Gila....25c
100 Hillside....1.80
515 Independence....1⅞@1.70
580 Jupiter....75@60c
240 Leopard....65c
40 Leeds....50c
1000 Martin White...1.65@1½
50 Meadow Valley....30c
200 Metallic....75c
110 Mono....6½
100 Mt Diablo....7@7½
135 Mammoth....7⅞
1800 N Noonday....4@3⅞
1450 N Belle Is....30c
345 Noonday....3.95@3.70
90 Northern Belle....4¼
250 Navajo....45@40c
2300 Oriental....40@50c
1750 Paradise....1½
50 Queen Bee....15c
170 Raymond & Ely..1.15@1¼
60 Star....50@60c
550 S Bulwer....35@40c
310 Syndicate....6½
160 Summit....1.30@1.40
670 Tioga Con....3.15@3.30
200 Tuscarora....45@40c
790 Tiptop....1¼
100 Vortex....25c

Pacific Board—Latest Sales.

Wed'sday A.M., Oct. 22.
100 Alta....5⅞
20 Alpha....14⅞
100 Belcher....3⅞
140 Best & Belcher....18½@18
50 Bullion....7.40
100 Chollar....6⅞
10 Con Virginia....5½
150 California....5⅝
100 Crown Point....3.95
80 Con Imperial....1.10
20 Exchequer....5½
60 Gould & Curry....10½@10
50 Hale & Nor....13⅝
50 Justice....3
130 Mexican....34@35½
310 Ophir....33½@32⅞
40 Overman....9⅝@9½
70 Potosi....5⅛
140 Savage....11⅞@11½
20 Scorpion....5
210 S Nevada....57½@57⅞
30 Union....71@71½
110 Utah....22@22½

AFTERNOON SESSION.
100 Andes....1.10
50 Bodie....13½
100 Bullion....7⅝
300 Colorado....3⅞@4
20 Con Imperial....1¼
30 Con Virginia....5⅝
50 Day....1.15
50 Eureka Con....24⅞
20 Exchequer....5¼
80 Gould & Curry....10
60 Justice....2.95@3
100 Lady Wash....1.15@1.20
150 Mono....5⅞@6
50 New York....40c
600 Oro....1.30@1¼
50 Ophir....33⅞@33
750 Phil Sheridan....50@40c
80 Sierra Nevada....59½@59
50 Union....73@74
50 Uncle Sam....2¼
250 Wells-Fargo....10c
10 Ward....2½
20 Yellow Jacket....14⅞

California Board—Latest Sales.

Wed'sday A.M., Oct. 22.
30 Alpha....15½@15⅞
40 Alta....5⅞
350 Atlas....45@42c
30 Belcher....3.90
10 Best & Belcher....18½
20 Bullion....7½@7⅞
30 California....5½
20 Con Virginia....5⅝
150 Con Imperial....1½
40 Crown Point....3.90
70 Chollar....6⅞@6⅝
50 Challenge....2.10@2.15

AFTERNOON SESSION.
20 Alpha....14½
20 Alta....5⅞
350 Argenta....95@90c
500 Atlas....45@44c
300 Almaden Q....1¼@1⅜
30 Belcher....3.85
30 Best & Belcher..17⅞@17⅞
40 Bullion....7⅞@7½
200 Brilliant....15c
600 Black Hawk....72@75c
50 California....5½@5¼
20 Con Virginia....5⅝@5⅝
200 Con Imperial....1.10

30 Caledonia	2.55	40 Crown Point	3.85
60 Exchequer	5c@5¼	30 Challar	.6¼
100 Favorite	.15c	20 Challenge	2.10
40 Gould & Curry	.10¼@10¼	30 Caledonia	2.45
1000 Globe	.8c	800 Coso Con	.5c
100 Gipsy Q	.9c	30 Exchequer	.51
20 Hale & Nor	.13¼@13¼	150 Enterprise	.11
20 Julia	3.60	30 Gould & Curry	.10¼
35 Justice	3.05	130 Julia	3.65
100 Leviathan	.60c	30 Justice	2.90
40 Mexican	.34¼@34¼	50 Mexican	.34¼@31¼
300 N Sierra Nevada	.13c	100 Mint	.15c
150 New York	.50c	30 Ophir	.33c@33¼
300 N Union	.40c	20 Potosi	.4¼
40 Ophir	.33¼@33¼	10 Savage	.11¼
10 Savage	.11¼	30 Sierra Nevada	.58¼@58¼
40 Sierra Nevada	.58¼@57¼	100 S Utah	.9c
100 Senator	.25c	150 Silver Hill	1.30
30 Union Con	.71¼@73	140 Senator	.25c
20 Utah	.2¼	200 Trojan	.15c
400 Wells-Fargo	.11¼@10c	30 Union Con	.73c@72
20 Yellow Jacket	.15¼@15¼	20 Yellow Jacket	.14¼@14¼

Mining Share Market.

The condition of the stock market the current week does not present any salient features upon which to hang the forlorn hope of a "boom." An astonishing feature is the fact that the good news of the rich strike in Sierra Nevada did not cause the market to respond, except in one instance, when a slight but sharp advance was made in Sierra Nevada and Union Con. Perhaps the heavy, dull condition of the market does not depend so much upon lack of confidence in reports as in the fact that there is no money circulating, or at least attainable for speculative purposes. Manipulators, like sponges, have taken in all the pecuniary moisture of investors and have left nothing but the dry-as-dust hut-never-full class of "agents," who find their occupation gone. Active mining has diverted considerable money into other channels for the present. Perhaps the approaching change in the government of the State prevents many from disposing of their surplus income in speculation. Whatever may be the cause, an effect exists, viz, a dull though steady market, which it seems impossible to stir up by anything less than a tremendous explosion of some, at present unknown, financial phenomena.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Martin White, Oct. 13th, $4,210; Belle Isle, Oct. 20th, $16,000; Leopard, Oct. 16th, $5,900; Belle Isle, Oct. 20th, $16,000; Alexander, Oct. 17th, $7,290.85; Northern Belle, Oct. 18th, $9,122; Bodie Con., Oct. 20th, $30,500.

LATE MINERAL PATENTS ISSUED.—Patents have been issued for the following mining claims in California, to date: Amador county—Thomas Sorrocco, *et al.*, Placer. Butte county—J. B. Hewitt, Placer; Thos. H. Dodson, *et al.*, Placer, Cherubusco mining district; Wm. Armstrong, Bobhies Blue Ledge, Wyandotte mining district. Calaveras county—Thomas J. Sparks, *et al.*, Placer, Stone Cabin Gravel, Chile Camp; Lawrence Sullivan, *et al.*, Placer; James Gunter, *et al.*, Placer, Washington Ranch district. El Dorado county—Jorgen Anderson, *et al.*, Sailor Placer; Jas. A. Hancock, *et al.*, Old Henderson and Fryer Placer. Inyo county—Virginia Con. M. Co., Golden Gate mine, Keystone Lode, Sister Lode and Mill Site, Virginia mine, West Virginia Lode. Los Angeles county—S. B. Caswell, *et al.*, Towsley Petroleum Claim; Jonathan D. Dunlop, Dunlop's Blue Light mine. Nevada county—Vincent G. Bell, Slide Quartz mine. Placer county—Frank Smith, Canyon Creek Placer. Tuolumne county—Henry Williams, Gilles and Carrington Quartz Mine and Mill Site. Yuba county—W. M. Crane, *et al.*, Placer. I. E. Brown, Placer.

JACKSON'S UNIVERSAL WRENCH.—Andrew Jackson, of this city, has recently patented, through the MINING AND SCIENTIFIC PRESS office, an improved universal wrench, consisting of a novel combination of a stationary and movable jaw, the moving ends of which are separated or closed in a line diagonal to the handle by means of a screw, which actuates a movable nut. The movable jaw is hanged to this nut, so as to open or close at will, and is kept closed by a spring. The tool is simple, easily and readily fitted to any nut, bolt or pipe, and has few parts to become broken or get out of order. The shape of the jaws is peculiar. The fixed jaw has a depression formed in its end with three faces, while the movable jaw has two faces and a projecting lip, which extends over the end of the fixed jaw, so as to rest upon it when closed. The outer end of this lip turns up, so that the jaw will be readily opened by simply pressing it against the nut or pipe. Mr. Jackson's address is 143 Fremont street, in this city.

COURTNEY challenges any sculler in England, for £200 a side, the race to come off at the beginning of 1880.

THE number of troops in Austro-Hungary is 1,094,000, in France 1,815,000, and in Russia 2,389,000.

EX-GOVERNOR STANFORD has arrived at New York.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

ALPINE.

ISABELLE TUNNEL.—*Monitor-Argus*, Oct. 20: The tunnel is in about 1,100 ft, and is progressing at the rate of from 8 to 10 ft per day. This is an enterprise of great magnitude, the tunnel being 8x9, with a prospective length of some 0,000 ft. It has excellent prospects of success.

AMADOR.

BUTTE BASIN.—*Ledger*, Oct. 18: A large body of water was struck in this claim on Monday, bringing the underground operations to a temporary standstill. The flow of water was so great that in spite of the pumping facilities, capable of throwing 20 gallons every minute, the water gained so rapidly that inside of 24 hours it stood three ft deep in a tunnel 100 ft in length. Mining has been abandoned for a few days, to see if the water will not decrease, so that the present pump can manage it. If not, a steam pump will be brought into requisition. It is believed that the extraordinary flow of water is an infallible sign that pay gravel is close at hand.

CONEY.—The contract for grading the mill site was let last Monday to some Austrians, but grading operations have not yet been commenced, nor will they be until next week. The contract for building the 40-stamp mill has not been let. The heavy timbers for the batteries are on the ground, and the work will soon be under full headway. The new steam hoisting works are expected to be started to-day (Saturday), which will speedily solve the question of draining the shaft. Retimbering the shaft has progressed to the depth of 140 ft, and it is thought that not more than 100 ft more will have to be retimbered.

MISCELLANEOUS.—S. H. Clark last year put up a stamp mill to work the cement met with in his gravel claim near Oleta. The gravel has changed since then, and will admit of washing by hydraulic power. The mill has heretofore been changed so as to crush quartz, and 20 tons from a quartz mine in that vicinity are awaiting crushing.

PLYMOUTH.—The Phœnix company are now running 80 stamps by steam power, the water now being out of the ditch. Several hands have been at work to-day retimbering the tunnel, so that in a day or two it will be all right, and water coming down the ditch.

NEW ROASTING WORKS.—*Dispatch*, Oct. 18: The new roasting works for ore, of Emmerson & Co., recently erected near the Good Hope mine, was put into active operation last Saturday, and we are told that it gave perfect satisfaction to its constructors and owners. They claim that their process of extracting gold from ore will eventually work a complete revolution in the working of gold-bearing quartz.

CALAVERAS.

FAIR PLAY MINE.—This mine is situated on San Domingo creek, a short distance west of the Hathaway mine, and about one and a half miles from the road leading from Murphys to the Big Trees, and owned by Smith & Co., of San Francisco. The owners are now running a tunnel and have already reached a distance of over 300 ft with good ore all the way. The lead has been traced for several hundred feet. The owners estimate the ore at about $16 per ton. The lead is from two to two and a half ft in width. A mill will be erected on this claim in a short time. Quite a number of men are at work already.

THE UNO CLAIM.—This claim is owned by Sylvester & Co., and is situated on the Dehring ranch in Nassau valley. The Doctor says he has sunk a shaft about 30 ft deep. The vein is about five ft in width, and he thinks it will pay about $10 per ton. He has extracted some 35 tons, which he is at present unable to work for want of proper machinery.

ITEMS.—The Fletcher Bros. are running a tunnel in their claim on what is known as Dead Horse hill, with fair prospects. Many rich deposits of gold were found on this hill in early days, and perhaps many more will be found in the years to come. Some 10 or 12 men are now engaged in mining on the Utica, all of whom are doing very well. The Vanderbilt mine on Chapparel hill, near Carsons, is being worked day and night. Potter and McCauley are engaged in mining on what was formerly known as the Doc Hill mine. Their shaft is down perhaps about 20 ft. The vein in the bottom of the shaft is some five or six ft wide and looks well, but we were told that the richest part was not more than six or seven inches wide.

BOSTON MINE.—Calaveras *Chronicle*: This property, in Buckeye gulch, has been sold to a San Francisco company. We understand it to be the intention of the new proprietors to thoroughly prospect and develop the mine, and a force of hands has already been set at work. A tunnel is to be run into the hill several hundred feet, on the ledge, preliminary to more extensive developments. The company will erect reduction works in the near future, the rock carrying gold and silver-bearing galena sulphides that cannot be satisfactorily worked by the ordinary milling process. The Boston mine is a large, well-defined ledge, and it has been pretty extensively prospected with favorable results.

NEW WORKS IN CHAMPION.—A new shaft is to be sunk, work upon which is already commenced. The old shaft—some 500 ft in depth—is too crooked to work. New hoisting works of the most powerful description are being erected over the new shaft, and the work of sinking is being pushed as rapidly as possible.

INYO.

MODOCK.—*Independent*, Oct. 18: Work is going on in the 1000 level, with following results for past week: Drift south, 300 level, run 18 ft; connection drift between No. 1 and 2 crosscuts, 300 level, 15 ft; north crosscut, 300 level, 15 ft; north crosscut, 1000 level, 14 ft, and under drain, 92 ft. Total length of drift south, 300 level, 316 ft; connection drift, 300 level, 15 ft; north crosscut, 300 level, 52 ft; north crosscut 1000 level, 130 ft; under drain, 370 ft. Connection drift at 300 level continues with ore vein started on and is looking well as they advance. Will sink on ore near mouth of crosscut No. 2 as soon as the connection is completed. The 800 and 1000 level drifts are in good ore ground and are promising points. The under drain is making good headway, giving plenty of air for its present distance.

THE PINCHOT MINE.—The *Independent* speaking of this gold mine, the property of Messrs Kelley, Beyer & Miner, says: It is situated on the side of the Sierras, about five miles northwest from Big Pine, and one mile above the placers from which so much coarse gold was taken some years ago. It is the old Black Warrior, which McMurray opened and run arastras upon in '73-74. It passed into the hands of the present owners—who are thoroughly experienced in the business of mining and reducing ores—in June last, or at least they then began work upon it. The ledge is full three ft in width, bearing honeycombed and decomposed quartz which, assayed by Curt Ober, at Mammoth, carries $480 in gold to the ton. The country around is seamed with large and small ledges, but so far none have been sufficiently opened to show their worth. The mine in question has been worked through an incline 45 ft in depth, from the bottom of which drifts extend 80 ft along the ledge. The owners intend tunneling to get 100 ft deeper. An arastra has been kept in steady operation for some time, which rods process, however, saves but little of the gold.

MONO.

HOMER DISTRICT.—Mammoth City *Herald*, Oct. 15: Among the lucky owners of locations in the Homer district, situated on Mill creek, are our fellow townsmen Frank Hutchinson, H. D. Bequette and Charles Ball, who, together with Jack Kohoe and Hitchcock, the discoverers, have located in the Sovereign claim, a 20-ft lode, showing well in gold, and the Hawkeye, a late discovery. The latter ledge is 12 ft wide, and shows very rich in gold in the croppings. They are also located in several other late locations in that district.

REFORMATION DISTRICT.—In consequence of some informalities in locating this district a few weeks ago, it has been reformed to the satisfaction of the miners of Tioga and Jordan districts. The boundaries are as follows: Commencing at the quarter section corner on the line between sections 15 and 16, in township 2, north range 25 east, Mt. Diablo meridian; running thence north to Castle Peak district; thence west along Virginia creek to the westerly line of Mono county; thence south along said line to the head of Lee Mining creek; thence east along said creek to the line of section post, and thence to the place of beginning.

NOONDAY.—Bodie *Chronicle*, Oct. 18: In going down with the shaft three ledges were cut, the first 60 or 70 ft from the surface. The second about 150 ft, the third about 280 ft. These ledges have their top west of the shaft, but dip east; and on the 300 level are all east of the shaft. The ledge at 280 ft is again cut by an east crosscut 90 ft from the shaft. The ledge cut at 150 ft is again cut in the same east crosscut about 110 ft from the shaft, and is well defined and is five ft thick, of good milling ore. On the 200 level the ledge has been exposed in the Noonday and North Noonday claims a distance of about 800 ft, all this to near the surface is ready to be stoped out. On the 300 level, drifts are being run on the vein north and south preparatory to excavating the ore. The main shaft has been sunk to the 412 level, and timbers are being put in for a station. The mill is progressing finely and will be ready to run about December 1st.

SOUTH BUTWER.—Drifting north on the ledge from winze No. 2 on the 350 level. The ledge is looking very favorable, being more than the width of the drift of a fair character of ore. It is the intention of the company to put in pumping machinery at an early day, when sinking will be resumed.

MCCLINTON.—The west crosscut has been driven this week 10 ft; total 133 ft. The ground has been somewhat harder. The north drift on Eshington ledge has been advanced 10 ft, and the ledge has widened. The east crosscut from new shaft has made good progress, being now in 40 ft, and cutting several seams of quartz this week.

UNIVERSITY.—The new three-compartment shaft has attained a depth of 130 ft. The formation is iron-stained porphyry, filled with seams of clay and quartz. The shaft is 13 ft 9 inches long by 4 ft in width, and is well and substantially timbered by 8x8 square timber, and lagged with 2-inch plank. A new safety skipp has been made and will be put in and running next week.

BLACKHAWK.—Quartz and vein formation still improving as the shaft goes down. Crossed a five-inch vein in drift at bottom of Warren winze. It looks well but does not prospect as well as it should.

CALIFORNIA.—The new shaft is down 44 ft; an advance of six ft. Rock hard in the bottom. During the week a small house was erected over the shaft.

OOONSHAW.—With the exception of one boiler and the pump the pumping machinery is on the ground—some 17 tons having arrived—and all hands are busy getting ready to place it in position. Superintendent Buckley is in hopes of getting the new works running between the 1st and 5th of November.

SOUTH STANDARD.—Grading for the new pumping machinery will be finished to-night, and the laying of the foundation will be commenced on Monday. By the time the foundation is laid the machinery will be here and the work of putting it in position will be pushed energetically.

BOOKER.—The shaft is down 462 ft. The ground is working better this week. The Cornish pump raises 190,000 gallons of water every 24 hours. Superintendent Elsworth has contracted for 700 cords of wood to run the works the coming winter.

NEVADA.

SMALL MINES.—The Nevada City *Herald*, speaking of the receipts of bullion from small mines in that vicinity, says: Phil. Richards, at his banking establishment on Main street, is buying and shipping an average of from $3,000 to $4,000 worth of gold per week that comes from the small claims in the vicinity of Nevada. It is a good showing, considering that this is the dullest season in the year for the business, and there are two firms in the city in the same line of business. The large quartz mines are as a rule producing bigger amounts than ever before known in the history of the district.

IDAHO MINE.—*Transcript*, Oct. 18: The vein on the 700-ft level, 1,100 ft east of the main incline, has been recovered and bids fair from the indications to be a bonanza of no mean proportions. The main chute of ore is found between the 1000, 1100 and 1200 levels to be doubling back to the west in the form of a letter U. The vein averages 4 ft good, and in some places is 6 ft thick at the depth of 1,120 ft. It is strong and lively, and carries more and more free gold as it descends. It is evidently approaching a more compact ore body than any yet encountered. This chute of ore has produced already $10,690,000 for the Idaho and Eureka companies. The fact that there is now a new vein on the 700 and 800 levels east, with 1600 ft of virgin ground, and heavy development on the 1100 and 1200 levels, are pretty good proofs that the prospects of this mine were never better than now.

A GOOD CLEAN-UP.—A crushing of 16½ tons of ore from Pare & Ragan's claim, on Deer creek, just made at the Deadwood mill, paid about $10 per ton. There are 100 ft of drifts in the mine, and nearly enough ore in sight to keep the owners at work all winter.

SOAPSTONE MINE.—We learn from the Grass Valley *Union* that a mill is to be immediately erected at the Stockbridgs Soapstone quarry, near Colfax, to reduce the rock and save the sulphurets which contain both gold and silver. The reduction machinery to be used is one of Cooper & Cowle's pans and rollers, which is an improvement on the old style Chile mills, the pan being broad and having a large grinding surface, and the wheels being geared in a manner to make them capable of much more reducing capacity than the old style mills. This machinery is now in process of manufacture at Sacramento, and in about two weeks will be set up in running order at the quarry, being driven by steam machinery which is already in place. The quarry has been opened to a width of from 50 to 60 ft, and a great deal of the rock contains sulphurets which by actual working process is found to pay $5 per ton. As it is easy of extraction and can be reduced very cheaply, it is confidently believed that good profits can be realized by the saving and working the sulphurets, as they alone contain the gold, there being none found in the rock. The sulphurets will then probably be worked by the chlorination process.

THE LIVE YANKEE MINE.—The *Transcript* says the Live Yankee mine near Nevada has been purchased by John T. Bradley, of Oakland. This mine was bonded over a year ago by Fred Jones, who put up temporary machinery and sunk a shaft 123 ft. Drifts were opened and various crushings of rock made that showed an average of $34 per ton. The last crushing went over $40 per ton. The ledge is from 2 to 6 ft in width, and is heavy in gold-bearing sulphurets. Heavy pumping and hoisting machinery is to be erected on the mine, and a three-compartment perpendicular shaft sunk. Fred Jones will continue as Superintendent. Messrs. Bradley and Jones are both old Grass Valley quartz miners of many years' experience in the business.

ROCKY BAR MINE.—The *Foothill Tidings* informs us that this mine is now working about 75 men and continues to look favorably. A recent crushing of 250 loads of rock yielded $30 per load, not counting sulphurets, and another lot is now going through which looks as well. The drift to connect the old Chavanne shaft is close on to completion, and the drain drift from the New York Hill has only about 100 ft to run. This will enable the work to go on in winter with much less expense, draining off the surface-water through tunnel. We learn from some of the company later in the week that the drift between the new shaft and the old Chavanne shaft is likely to show that there are two distinct ledges in the mine, about 40 ft apart. As both are pay ledges, it would seem a happy disappointment. A cross-cut is being run to connect the two and drain the old shaft.

RICH QUARTZ.—Grass Valley *Union*, Oct. 21: A clean-up of 27 loads of quartz from the Judd & Casey claim, on Osborn hill, made at the Allison-Franklin mill, gave a yield of $80 per load. The Judd & Casey is being worked in a quiet way, but it never fails to produce good results when the crushings are made. The shaft on the claim is 210 ft deep, and the hoisting done with a whim. The ledge in the drifts and stopes shows a general width of about 18 inches.

SACRAMENTO.

THE FOLSOM "STRIKE."—A correspondent of the *Record-Union*, who did the work, gives the following particulars: On the 17th of July prospecting was commenced with a set of artesian well-boring tools, and was continued with several interruptions till the 25th of September, when the granite was reached. Numerous rock strata were perforated and several auriferous sand and clay veins found, the first being at a depth of 36 to 42 ft and was composed of green, sandy clay, containing fine gold averaging five cents to the pan. This vein is 12 ft thick and lies above the low-water level of the American river. At from 50 to 63 ft is a vein of fine quartz sand and gravel containing sulphurets assaying $15 per ton. No gold of any consequence was found from this till a vein of blue clay at 102 ft was reached. This strata lies on the granite and is 10 ft thick, making the rock 112 ft from the surface. As the shaft was commenced where the soil had been washed away some 25 ft, the granite is 137 ft from the natural surface. In this clay gold in paying quantities was found, and at the bottom, or just on the granite, 32 cents was the product of about 25 cubic inches of earth. This mode of prospecting is now, and, I believe, has never been attempted in California before. Gold was found on W. Owyun's tule land in the Lisbon reclamation district by the same parties operating at Folsom, but the position of the strata containing it was such as to prevent its being successfully worked. The results at Folsom show this to be a very satisfactory way of prospecting, and, as it is far less expensive than any other means now employed, will prove of great advantage to the mining interests. Not only coarse gold, but also the very finest float gold was brought up, and mining men express themselves as perfectly satisfied that the prospecting was thoroughly done. The intention is to prospect a large claim on the bank of the American river, and if future results are as satisfactory as the present, to open up and work the mine. At present work is stopped in order to completely work up the data already obtained.

SIERRA.

ITEMS.—*Messenger*, Oct. 18: The Bonanza company are busily at work raising their shaft, which will be about 300 ft deep.

The Union mine, at Gibsonville, has recently found richer ground than it ever had before. The company is working vigorously.

The shaft sunk by Horace Taber for the Monitor company has reached bedrock, but nothing was found on the bedrock to warrant drifting. Gold in small quantities was found all the way down until within a few ft of the bottom.

TUOLUMNE.

CONFIDENCE MINE.—*Democrat*, Oct. 18: Work is progressing in the mine with favorable results. The ore now being crushed is from the five and eight hundred ft levels. This week another fine body of ore has been discovered in the mine; the last, we heard, was opened 12 ft, showing a high grade all the way. There is ore enough to last for years of a moderate paying quality. The past history of the mine is sufficient to warrant a belief in its great intrinsic value, as at periods high grades have been found and paid very largely.

NEVADA.

WASHOE DISTRICT.

OPHIR.—Gold Hill *News*, Oct. 22: Hardy vein is being followed on the 2100 level at the rate of two ft per day, and is still yielding milling ore; total length of the drift from crosscut No. 1, 123 ft. The joint Mexican crosscut west on the 2000 level is now 272 ft in length and in hard-blasting porphyry showing some water.

SIERRA NEVADA.—The drift south and west from the 2300 station of the incline is now 60 ft in ore, the face still in ore of fair milling grade, but not so rich as near the hanging wall. The water is out of the incline to the 2400 level, which is being cleaned out preparatory to starting a crosscut on this level, which will be done in a day or two. The workings east on the 2200 level and from the foot of the east shaft are now in 170 ft, the face in hard-blasting porphyry.

UNION CON.—The drift south and west from the 2300 station of the Sierra Nevada incline is now in 00 ft, and passing through ore of fair grade and milling quality, although not so rich as that next the hanging wall of the vein.

ALTA.—On the 1850 level the drifts north and south have both cut into quartz. These workings have been swung round so as to enter the ore vein diagonally, and they are opening a fine prospect.

CON. IMPERIAL.—The winze from the 2600 level is down 65 ft and the bottom is in a beautiful formation of quartz but of low grade. This winze will be continued to the 2800 level for the purpose of opening that up. The east crosscut, 2600 level, starting 125 ft north of the south winze is being prospected by the diamond drill. At a distance of 20 ft from the lateral drift a body of quartz which extended some 40 or 45 ft in width, and yielded assays from the drillings of from $5 to $5 was struck.

MEXICAN.—The joint Union crosscut west on the 2000 level is in a mixed formation of soft vein matter with streaks of clay and considerable quartz; total length, 215 ft. The joint Union winze from the 2000 level is in a formation similar to that in the crosscut only carrying more water; total depth, 145 ft.

CON. VIRGINIA.—The drift south from the west crosscut, 850 level, is now 190 ft in length and passing through a vein formation of clay and quartz. The winze from the 1500 level has of late been penetrating low-grade ore; total depth, 40 ft. The raise from the 1650 level to meet this winze is up 70 ft, and a drift has been started toward the point of connection.

BATTLE MOUNTAIN DISTRICT.

COOD MINE.—*Messenger*, Oct. 18: We learn from Walter Dawe that the mine owned by him and Mr. John Ramdohr at Galena, is proving to be among the best in the district. They have 40 ft of shaft and 150 ft drift. The ledge, which is 5 ft wide, contains argentiferous galena in good quantities. They have 7 tons of ore that assays $150 to $175 per ton, and 20 tons that assays from $40 to $60 the ton.

BELMONT DISTRICT.

BELMONT.—The last official report from the *Courier* says: Our stope north is looking well and yielding the usual amount of pay ore. The drift started north from No. 2 raise under the ore was advanced 0 ft during the week, through a vein of quartz 5½ ft thick, with 1 ft of same good milling ore.

OILA.—Letter of September 29th says: During the past week the south drift from south drift winze No. 2 was driven 4 ft. In it we have struck a wide vein of good ore and one that promises to yield a large quantity. An average assay of the vein has not yet been made, but an assay of $286.32 has been had from a selected piece. The stope in south drift winze is looking well and yielding about 6 tons per day. At the mill we now have 130 tons of ore. If we had salt we would start immediately. I learn from Mr. H. we will have it in a short time, when the mill will start. In a few days—as soon as lumber can be got—I propose starting drifting in the 200 level, and think that in 100 ft we will strike the continuation of the old ore body worked during 1875. If not, we will certainly strike the ore we are now at work upon. In running this level we greatly facilitate the handling of the ore and reduce the expense.

COMO DISTRICT.

ITEM.—The Lyon Co. *Times* says: Como is assuming the appearance of a prosperous mining camp. Twenty new buildings already up and more building. Black sulphuret ore was struck in the bottom of the Eureka shaft last Wednesday evening, assays of which go up in the hundreds. This had the effect of making the owners of the claim more exacting than heretofore; and whereas they would gladly have accepted $30,000 for it a week ago, they now ask $50,000.

[CONTINUED ON PAGE 268.]

Homer Mining District, Mono County.

Another "treasure trove" has been added to those already existing in Mono county, California. This one is in the Mill Creek mountains, now known as the Homer mining district. In a descriptive article, the Bodie *News* cites Holy Writ to the effect that "there is much gold there; and the gold of that land is good." We opine that very few mining districts are supported upon Scriptural authority, hence this new district possesses unusual interest on that account, if on no other.

It says: Homer district is situated 22 miles southwest of Bodie, within Mono county. In going up Mill Creek canyon for the first three or four miles, the high grey granite mountains, on either side, present a forbidding barren aspect, and no one, to quote the language of our text, would expect to find "much gold there," and it is not strange that the energetic prospector should have been so many years in forcing his way over the rocks and up the canyon beyond these granite peaks, to the gold and silver-ribbed mountains above. On reaching a point five miles above the mouth of the canyon, the appearance of the country suddenly changes, the mountains presenting a reddish brown and soft yellow color, and on examination these mountains are found to be composed of immense alternating dykes, thousands of feet in width, of metemorphic and talcose slate and quartzite, with here and there a dyke of some eruptive rock, not yet classified, but which will probably be placed in the family of trachytes. To the practical eye of the prospector, and the trained mind of the scientist, these alternating formations at once suggest the presence of rich gold and silver-bearing veins, and the recent discoveries there have fully confirmed the theories of both.

Gold was discovered in March or April, 1879, by William D. Wasson, who located his family at a point in the canyon five miles and a half above where it debouches into Mono Lake valley, and soon after began prospecting. He discovered several veins, notably the Golden Girdle and Little Blue, both of which gave promise of great value when properly developed. On the 23d day of August Charles H. Nye (a relative of the late U. S. Senator, James W. Nye) and Lawrence L. Homer discovered and located the Nioma and Wasatch veins, the remarkable richness of which was the primary cause of the excitement concerning the district. O. J. Lundy and his partners in the saw-mill in the canyon, Messrs. Boomershine and Morton, and also James McDonald, made discoveries early in the summer, some of which have proven to be of great value.

Later discoveries worthy of particular note, include the Crevasse, Secret and Wonder by Nye and Homer, the May Lundy, Minnie Lundy, Dick Turpin and several other claims by Judge Owens and others, two or three ledges remarkably rich in free gold recently discovered by James McDonald and others, the Callamer and Golden Prince by A. F. Proctor & Co., and the Lucky Dan discovered a few days since by Daniel Olsen. Dozens of other ledges have been discovered in the district within the last two weeks, many of which show free gold on the croppings.

The Principal Mines

Of the district, so far as present developments show, are the Nioma, Wasatch, May Lundy, Dick Turpin, Crevasse and two of McDonald's discoveries, the names of which we cannot recall. Many others show free gold in abundance, but the district is young and so little has been done in the way of developing the mines that it would be hazardous to venture an opinion on the merits of all. The Nioma is perhaps the largest vein discovered in the district. In some places it crops out bold and high, and is estimated to have an average width of over 30 feet, but part of the ledge, especially the western side, is somewhat mixed with talcose slate. Four samples, taken from different places and across eight feet of the ledge where the quartz was unmixed, gave an average assay value of $183 per ton, chiefly gold of fine quality. The Wasatch lies six hundred feet east of, and parallel with the Nioma. It is a small ledge about two feet wide, but very rich, one streak about eight inches in width being literally salted and peppered by nature, with free sparkling gold. We have seen specimens from this mine which would not suffer by comparison with the richest pieces from the Bodie mines. The Crevasse, a large, fine looking vein very recently discovered, lies between the Wasatch and Nioma, and within the surface boundaries of the former. There have been no developments made as yet on this vein, but the croppings, where uncovered, give good assays in gold. The Lucky Dan, and the very rich claims recently discovered by McDonald, lie further south and over the summit of the high ridge, and are probably extensions on the Nioma and Wasatch belt. The May Lundy and Dick Turpin are near these claims and are very rich, the the metal in the latter being chiefly silver. The Callamer and Golden Prince both show very rich gold croppings.

Numerous tunnel rights have been located in the district, under the Congressional mining law, the mountains being very steep and favorable to that system of opening the mines.

The town sites have been surveyed and laid off in regular blocks, with wide streets. One in the valley, directly below the Nioma and Wasatch claims, is called Wasson, and the other, a mile and a half below, on the land of Mr. J. O. Lundy, an old pioneer who is living there with his family, is called Lundy.

Few places in this mountainous mining country are naturally so accessible as these new camps. Different roads leading from Bodie, Bridgeport, Aurora, Benton and Mammoth all converge near the mouth of Mill Creek canyon, and thence there is a good natural wagon road to within one mile of Lundy. Old Uncle Dan Olsen, of Bodie, has already applied for a charter to construct a toll-road up the canyon to the mines, and has had a working survey made and mapped by competent engineers.

It is said that capital has already sought and taken large investments in the mines.

Globe District, Arizona.

It is asserted by a correspondent of the Phœnix *Herald* that there is no other portion of the Territory of Arizona which promises more in the way of actual production than the Globe district. It already has the reputation of a great mineral belt destined to add largely to the wealth of Arizona. Indeed its wealth-producing power cannot be fully understood as yet while so many of its mines are still undeveloped, and tested by assay only, and so few mills are in operation to produce the bullion that the mines are capable of furnishing. As the tourist goes through the mountains, in every direction from Globe City he finds the outcroppings of ledges varying from a few feet to a hundred feet in width. These ledges can readily be traced for miles, in many instances across ravines and over mountain tops, and show such a vast deposit of mineral wealth as is rarely seen.

Hitherto the facilities for milling have been inadequate, and are so still, if the owners of mines would work them for the legitimate purpose of producing money by actual toil. This is a lesson the miners of Arizona must sooner or later learn if the Territory is to ever become famous as a rich mineral region. Capitalists will not buy mines at anything like a fair valuation unless they have been shown by actual mill test to possess more than a mere speculative value.

Happily for the district, there is now a fair prospect that the mills will be able to furnish miners with facilities for testing the real value of their property by actual production. The Isabella mill, for instance, is now running on custom ore, and the results are such as to fill even the most doubtful with hope as to the future of the mines in this region. When the mill was first erected it was hastily constructed, and the results were anything but satisfactory. In the month of June, the mill, run under the present management, produced only 2,892 ounces of bullion. Major Sisson, the present Superintendent, not being satisfied with the result—not paying expenses in fact—began to reconstruct the mill so as to be worked more economically by automatic handling of the ore, and so increased the capacity of the mill that the results have given a new impulse to the mining interest of this locality. The month of July and nearly the whole of August were spent in this work of repairing, and during the last two weeks they have worked 90 tons of ore, producing 20,430 ounces of bullion. They guarantee to the owners of ore 80% of the assay value, and charge $45 per ton for crushing. At present they are running but five stamps, but the company have in contemplation the putting in of as many more, thereby doubling the capacity of the mill at but very little additional expense.

The little mill is a marvelous success, and will solve the problem of the mining interest of this section. In addition to this there is a prospect of four other mills being erected soon. The Miama mill, recently burned, will probably be rebuilt at once. A mill to work the ore of the Mexican mine will also soon be erected. Also one at Richmond basin, where they are now digging the well and laying the foundation for the machinery. One or two others are spoken of, and steam hoisting works are being put up on the McCormick mine.

The daily production of wealth is, after all, the only safe standard of value, and this is now being realized. Messrs. Eaton and Bailey have just had worked in the Isabella mill, from the dump of the Rescue mine, 29 tons of ore. The result was 15,296 ounces of silver bullion of a quality from 850 to 950 fine, and worth, at the standard value, $19,313. This bullion is now on its way to San Francisco, and will have the effect of attracting the attention of capitalists to the hidden wealth of Arizona.

Rich strikes have recently been made in several of the mines, and large bodies of ore have been uncovered. In the Southwest Alice mine, owned by Dr. Thatcher and Mr. Morehead, at a depth of 100 feet a large body of ore has been found which assays 360 ounces to the ton. A discovery of rich ore has been made in the Silver Era. In other mines there are equally promising openings.

Characene.—Dr. Phipson has succeeded in obtaining from organic substances present in fresh water a new and interesting product which he has named "characene." It is a kind of camphor which gives to the algæ in general, and to the waters in which they grow, that peculiar, marsby odor which has hitherto been thought to be one of the results of vegetable decomposition, but which really arises from a substance produced by certain plants while they are alive and vigorous. As yet few of the properties have been definitely ascertained.

Rich Strike in Mammoth.

The Lake (Mono Co.) *Mining Review* gives an account of another big strike in the Mammoth mine a few days ago. It appears that one night last week, W. J. Perks, the night foreman of the Mammoth mine, found some rich ore in a new crosscut, which was started the other day from the winze which has been sunk from what is known as the Bonanza tunnel. Specimens were brought from the tunnel to the office, and "all hands agreed—even the oldest miners—that nothing like it in the nature of gold quartz had ever been dug out of the earth. The specimens were not small pieces as big as walnuts, such as are usually shown, but huge chunks, some of them weighing as high as 10, 15 and 20 pounds, and one great boulder going even as high as 50 pounds. All were literally alive with gold. On every side gleamed huge 'epletches,' some as big as peach leaves, while all over and through the porous looking rock stood a solid incrustation of frosty looking gold, closely bound up with yellowish, iron-stained quartz. The size of the lumps and their formation indicated plainly the approximate size of the vein from which they came, and showed that it was no narrow knife-blade streak.

"It will be remembered that the rich gold strike of last spring was made in a crosscut started in the winze 60 feet from its mouth. The new crosscut in which this strike was made is 45 feet from its mouth, or 25 feet above the old one. The rich rock was broken into but a few feet from the mouth of the crosscut, and in quality it is far superior to the find of last spring. And what is better, as a miner informs us, 'there are lots of it there.' The locality of the new deposit and its comparative nearness to the old one proves conclusively that the rich streak is an unbroken one for at least 50 feet in depth. How much further it goes down will have to be proved by crosscuts below the one run last spring. As we all know, the winze is down 200 feet. So there are yet 140 feet of 'virgin' ground to be tested by means of crosscuts. Whether this will be done immediately we are unable to say."

Gold Deposits at Folsom.—Nearly all the gold mined from the alluvial deposits in California has been found in beds of gravel deposited by running water, and so universally has this been the case, that miners do not expect to find gold in paying quantities unless the characteristic strata of gravel are found. The enterprise of Mr. W. H. Dolman, of Oakland, in prospecting for deep-gold deposits in the bed of what was once an inland sea has developed a very different and unlooked-for condition of these deposits. Instead of the boulder and gravel strata that were expected on the bedrock, only strata of sand and clay intermixed with the debris of marine shells were found, and while fine gold in paying quantities was passed through at different levels, as the boring progressed, it was invariably associated with sand or clay and not with gravel, while the coarser gold was found on the granite underlying all, and in such amount as to give a guarantee to the successful working of these deposits, which bid fair to be richer and more extensive than any mines heretofore discovered either in California or elsewhere. As we have before remarked, the town of Folsom—where these discoveries have been made—is situated on the shore of what was once a sea from 200 to 300 miles in width and many hundred in length. The primitive rock, either granite or slate, is intersected with veins of quartz, all of which contain gold either free or in the form of sulphurets. There is every evidence that the whole surface of the adjacent rocks has been disintegrated and washed into the sea to the extent of several hundred feet in hight. While the action of the waves, breaking along the shore for perhaps thousands of years, has reduced this debris to the finest of sand and deposited the gold on the bedrock in the condition in which it has been discovered.—*Folsom Telegraph.*

Remarkable Gangue.—The Placerville *Republican* in a late issue says: The first lode in the vicinity of Coloma which commands attention is the Sam Simms mine, one and a half miles southwest of the town. This is the most extraordinary mineralogical formation in California, and is the only one of the kind known in the State, and lies in the western part of the mineral belt. Though its total gold yield has never been made public, it is generally known to be large, while the expense involved in its extraction has been insignificant. The remarkable feature of this mine is that the gangue, for the most part, consists of a very rare and valuable metal, supposed to be vanadium or roscoelite. Quite a deep interest is being excited by it among scientists, and two very experienced mineralogists are now engaged in a series of tests, to enable them to determine, critically, what the mineral is. Should it be found in quantity, and prove as valuable as is now believed, additional importance will thereby be given to this portion of the great zone.

A Pre-historic Clam-Bake.—In excavating for the Jacksonville (Fla.) water works, recently, there was found, 28 feet below the surface, an ancient clam-bake. In a bed about six feet by four in area, the clam and oyster shells, many with gaping mouths, were arranged as for a modern clam-bake, intermixed with hardened sand, charcoal and fragments of decayed wood.

El Dorado and other County Mines.

A full account of the mining industries of El Dorado Co., California, appears in a recent number of the *Republican*, from the pen of M. H. Bennett, being the conclusion of a series of articles on the subject. In the general summing up, Mr. Bennett says that all the facts demonstrate that in this county quartz mining is rapidly gaining in favor, while placer and gravel mines are being operated with fairly good returns. The future gold yield of the State may be confidently coupled with a thorough exposé and utilization of the many and extensive quartz ledges. The quartz and porphyritic ledges and dykes are almost numberless, and it is owing to their disintegration, by time and atmospheric causes, that all, or nearly all, the hill-slopes, ravines and creek-beds have afforded such large returns to the surface workers.

Progress, such as is being made in improved gold-saving apparatus, and advances in the science of metallurgy, are combining to render many mines that were but recently considered unremunerative greatly esteemed, and vast quantities of tailings, more or less permeated with both free gold and sulphuret, will at an early day be made to return as much or more of the precious metal than when first milled.

All along the auriferous belt are to be seen what are termed "prospect holes," ranging in depth from one to two hundred feet. These have been abandoned, in most part, owing to a lack of intelligence as to the formation, impatience for a quick return; or, as in many instances, when fully convinced of the merit of the property, lack of capital prevents the successful prosecution of the work.

It is a very significant fact in connection with mining operations extending through the counties of Calaveras, Tuolumne, Amador, El Dorada and Placer, that wherever deep sinking has been done, the results have been gratifying. Yet, to an unaccountable degree does the opinion prevail now and heretofore has, and especially in San Francisco, that the veins along this great belt do, to use the local term, "peter out." A most forcible evidence of the fallacy and ignorance prompting such a conclusion is afforded in the case of the Pacific mine, at Placerville. Parties from San Francisco and New York, professed mining experts in times past, assuming the conducting of work for which they were totally disqualified, were the medium through which large sums of money were expended without satisfactory returns, simply because the investigations were not intelligently directed, and as a necessary sequence, the property was as often abandoned and pronounced as worthless. During the year 1878, the attention of some English capitalists was called to this property, and their experts came almost at once upon a large paying vein of ore, milling tests of which proved so gratifying as to lead to the purchase of the mine, which, owing to the disfavor in which it had been held, was sold at a nominal rate, a fractional part of its value. Every additional foot of depth attained under the present administration, reveals the rapidly increasing quantity and value of the ore.

Another striking instance is that of the Church-Union mine, on the same belt and about five miles south of the Pacific. Within the past six years, it, too, was abandoned as unprofitable, yet when placed under the management and supervision of capable men, its intrinsic value was thoroughly established, and a property that was not long since sold for taxes, has within the past few weeks sold for a quarter of a million.

The Gwin mine, in Calaveras, is now, while being worked on the 1400 level, paying much better than at any previous period, while the history of the mines in Amador is too well known to be stated. Suffice it to say, they are now yielding handsome returns at depths ranging from 1,200 to 2,000 feet.

Much may and should be said of the abundant and economic supplies of water that are at command for mining uses, and when compared as a motor for hoisting work and milling, affords a very great advantage over steam power, as regards the facility with which it can be attached and the simplicity of its management. If, however, steam power be deemed requisite as an auxiliary, wood for fuel can be obtained here, for years hence, at half or less than half the cost of it in any other important mining locality on the Pacific coast or interior; and when the time shall have arrived for using coal, the transportation cost of placing it in and along the mineral belt of El Dorado will prove insignificant as compared with that of taking it to any of the other mining counties.

The Metric System.—The educational society for introducing the Metric system, the American Metric Bureau, has just published a new edition of the standard work on this subject by its President, F. A. P. Barnard, President of Columbia College, New York, which has heretofore been published in New York at $3 per copy. This new edition contains three times the matter, and has been made the most complete work in the language, its index of 2,000 references making it really a metric cyclopædia. The society wish to scatter it widely through the country, as the best means of giving accurate information about the metric weights and measures of which so much has been ignorantly written. They offer it at $1.50, or one-fifth the rate charged by the New York publishers for the original edition. If not found at the book stores it can be had of the society by mail at $1.70. The address is Secretary Metric Bureau, 32 Hawley street, Boston.

Valuable Iron Mine.

The Oakland *Times* of October 17th informs us that a capitalist of Oakland has secured the title to a mammoth lodge or deposit of pure red hematite or sesquioxide of iron; a recent discovery, located near St. Helena, Napa county, within three miles of railroad and 60 miles from this city. The deposit is the largest of this class of ore ever discovered on this continent, the ledge or vein being more than a quarter of a mile in width, cropping out boldly on two mountains, separated by a deep canyon through which a stream of water flows, and the ore being exceedingly rich; thus making the discovery one of the most important to this coast that has been made since the discovery of the Comstock.

Red hematite is one of the most valuable of the ores of iron, as from it is made a large proportion of the finer varieties of iron and steel. The samples from the Napa mine (now on exhibition at the First National Gold Bank and at the real estate office of Woodward & Taggart in this city, and at 208 Montgomery street, San Francisco) are of foliated or micaceous structure, very compact laminæ, are of great purity, and singularly free from sulphurous, phosphoric and argillaceous substances. Nearly all the Bessemer iron, and the finest steel manufactured in England and America, are made from red hematite of less purity than the specimens we have seen from this mine.

The importance of this discovery can scarcely be overestimated, inasmuch as another discovery, recently made by a gentleman of this city, whereby iron ore can be reduced by the use of crude petroleum at much less cost than by the use of coal, can be utilized in building up an industry of great moment to this coast, and in supplying the Pacific States and Territories with an excellent article of iron and steel, for which we have heretofore been compelled to pay out millions annually to the Eastern States and Europe. It is said, also, that within the past six months large deposits of coal suitable for coking and the reduction of iron ores, have been discovered on the northern coast.

New Motive Power.

Speaking of the boundless possibilities of invention, the Boston *Commercial Bulletin* says: For a long time it was thought that continued mechanical progress was in great measure dependent upon the duration of the coal supply. But of late there has been a growing feeling that discoveries will be made by which a motive power independent of fossil fuel will be brought to light.

These views received strong support at the recent meeting of the British Association at Sheffield, particularly in the lecture given by Prof. Ayrton, on electricity as a motive power. Machinery in the hall was put in motion driven from power derived from a distance. By the use of electricity the waste of power in transmission could be reduced for any distance to not more than 30% of the whole power absorbed at the generator, so that the employment of steam engines of vast size outside a town like Sheffield would be by far the most economical means of extracting the energy out of coal.

Small steam engines we were told were the most expensive, for it was at least four times as expensive to produce power from them as from large ones. But electricity not only produced motive power, but heat and light, and by it they could heat from a distance a coil of iron wire white hot, and by putting it into a vessel filled with water the latter in a short time would begin to boil. Here we have simplicity itself in the generation of steam. In connection with power, the question of cost is a most important one, and in this there is a great advantage in favor of electricity, which could be sent down to where it was required, the same as gas or water, and regulated as easily. As to light, it appears that if there was a large quantity required in one place, that by electricity was 20 times cheaper than coal, whilst Sir W. Thompson went so far as to say that it might be made 133 times cheaper.

The Lotus in New York.—At the recent exhibition of the New York Horticultural Society, Mr. E. D. Sturtevant, of Bordentown, N. J., exhibited three water lilies, which promise to have great practical value for decorating grounds where there are small lakes. One of the plants was a true Nilotic Lotus, with circular leaves standing above the water, similar in appearance to those of our native *Nelumbium luteum*, and showing large nodding flowers. There were also some cut flowers of the *Nymphæa dentata*, a large flower of purest white—an enlarged copy of our own white water lily, *N. odorata*. Another was a blue variety, and most striking of all was a hybrid from two Indian varieties. The large heart-shaped leaves of this plant floated on the surface of the water, while the flowers were of a delicate pink shade. Mr. Sturtevant declared that these flowers, as well as those of the *N. dentata*, were fully 12 inches in diameter during the warm summer weather. These plants were all grown in the open air.—*Scientific American.*

Telegraph in Brazil.—The Brazilian government has presented to the Legislature a project for establishing a general system of telegraphs, to spread all over the republic like a network, and to be placed in immediate communication with the public offices.

Useful Information.

Borax for Salting Butter.

The Italian Minister of Agriculture has addressed a communication to the Chamber of Commerce of Milan relative to experiments in salting butter with borax which have been carried out at the agricultural station at Florence. From the account which appears in the *Giornale di Agricoltura*, borax would appear to have a most marvelous effect in insuring its absolute preservation. Samples of fresh butter made at the Florence station, and purposely not carefully freed of their buttermilk, were found, on the addition of about 8% of borax, to maintain their natural fine flavor, without the least change whatever, for upwards of three months. To attain this satisfactory result it is necessary that the borax should be perfectly dry and in very fine powder, and care must be taken to insure its thorough mixture with the whole mass of the butter operated on. Among the further advantages of this plan, it is noted that borax imparts no flavor of any kind to the butter, while it is entirely harmless in its nature, and also reasonably cheap. Still later experiments have shown that a very much smaller proportion of borax suffices to produce the desired effect, and also that simple solutions of the salt act quite as well as the dried powder.

It has been alleged that too much borax imparts a bitter flavor. This might be lessened by washing in water. The main point is that if borax should prove a useful preservative element for butter, meats, etc., the borax industries of Nevada might be very properly advanced.

Isinglass from Sea Weeds.—A very interesting product, called "kanten," or vegetable isinglass—a species of gelose derived from either of the sea weeds *Gelidium corneum* or *Plocaria lichenoides*—is made in China and Japan, and exported to Europe in flat and molded tablets and in bundles of strips. It is known in Cochin China as "hai thao." It is soluble in boiling water only, of which it takes up about 500 times its weight. It is manufactured as follows: The sea weed, called by the native name of "tengusa," is carefully washed and afterward boiled, so as to form a gluish decoction, which is strained off and put into square boxes. When cool it forms a stiff jelly, which can easily be divided into squares a foot in length. The manner in which the surplus water is removed is very ingenious. The jelly prisms are exposed in the open air during a cold night, and allowed to freeze. During the day the sun melts the water which runs off, leaving behind what one might term the skeleton of white, horny substance, which is extremely light and easily dissolved in hot water; when cooled it again forms a stiff jelly. This article can be applied to many purposes—for culinary uses, for making bonbons and jellies, for clarifying liquids, as a substitute for animal isinglass, for making molds used by the plaster-of-paris workers, for hardening the same material; in short, as a substitute for all kinds of gelatines, over which it has the advantage of producing a firmer jelly.—*Confect. Journal.*

Hydrogen a Good Conductor of Heat.—A very simple method of showing that hydrogen is a better conductor of heat than other gases, which is probably due to its metallic character, is described by Carl von Than. Two strong copper wires, several inches long, are held parallel to each other, but not in contact, by slipping over them two short pieces of glass tube, one an inch from the end, the other in the middle, and filling the tubes with plaster of Paris. The short ends of the wire are bent twice at right angles, so as to be an inch apart at the ends, and are connected by a very fine platinum wire. The wires are kept in a vertical position by clamping the second tube to a retort-holder or other support. The longer ends of the wires are bent apart and attached to the poles of a battery of three or four cells. The wires being insulated from each other, the current passes through the fine platinum wire, heating it red-hot. If a bell-jar of hydrogen be held over it, the wire ceases to glow, because heat is conducted so rapidly away. On bringing it into the air again it begins to glow.

Siphon for Carboys.—The *Pharmacist* gives the following from a German source: Bend two glass tubes at right angles, so that the longer end will exceed the hight of the vessel, while the aggregate length of the two shorter ends shall be a few inches more than the radius of the same. These tubes joined by means of rubber tubing, and one of the longer legs furnished with a perforated cork, serve as a siphon. Fit the cork to the mouth of the carboy; provide it with another smaller glass tube, to which is attached some rubber tubing several inches in length (the same as for a wash bottle); then blow through the latter. The pressure produced in the vessel is sufficient to cause the filling of the siphon.

To Distinguish Conductors of Electricity from Non-Conductors.—When the platinum wire is glowing in the air the current may be interrupted, and rods of zinc, iron, copper, silver, or gas carbon, as well as pieces of sulphur, phosphorus, glass or charcoal, introduced into the circuit. When a good conductor is inserted the wire glows; when a non-conductor is introduced it ceases to glow.

A Substitute for Porcelain Capsules.—A German chemist states that ordinary crockery vessels may for most purposes be used instead of the expensive porcelain capsules of the laboratory. The glaze on some of the former is superior to that on most of the ordinary porcelain vessels, and while they cannot be used for operations requiring the application of direct heat, they will answer well for making certain ferric and other compounds which readily stain or attack the porcelain laboratory ware commonly found. Moreover, the crockery ware can always readily be obtained, while the porcelain ware is not obtainable in suitable sizes.

To Polish Iron or Steel.—For those in the metal or hardware trades who wish to obtain that beautiful deep black polish on iron or steel which is so much sought after, all that is required is to boil one part of sulphur in ten parts of oil of turpentine, the product of which is a brown sulphuric oil of disagreeable smell. This should be put on the outside as lightly as possible, and heated over a spirit lamp till the required black polish is obtained.

Metallic Laces.—Debray uses wires of German silver in the manufacture of metallic laces. He colors metallic foils for the same purpose by depositing upon them iridescent films of oxide of lead. Litharge is dissolved in caustic alkali and the resulting solution is decomposed by a current of constant intensity, the positive pole of the battery being in communication with the metallic surface to be coated.

Good Health.

Memory in Different People.

M. Delauney has made a communication to the *Societe de Biologie* respecting memory as studied under various biological conditions. The inferior races of mankind, such as Negroes, the Chinese, etc., have more memory than those of a higher type of civilization. Primitive races which are unacquainted with the art of writing had a wonderful memory, and were for ages in the habit of handing down from one generation to another hymns as voluminous as the Bible. Prompters and professors of declamation know that women have more memory than men. French women will learn a foreign language quicker than their husbands. Youths have more memory than adults. It is well developed in children, attains its maximum about the 14th or 15th year, and then decreases. Feeble individuals of a lymphatic temperament have more memory than the strong. Students who obtain the prize for memory and recitation chiefly belong to the former class. Parisian students have also less memory than those who come from the provinces. At the Ecole Normal and and other schools, the pupils who have the best memory are not the most intelligent. The memory is more developed among the peasantry than among the citizens, and among the clergymen than among the laity. The memory remains intact in diseases of the left side of the brain, and is much affected in those of the right, from which it may be inferred that the right side is more the seat of this faculty than the left. From a physiological point of view, memory is diminished by over-feeding, by physical exercise, and by education, in this sense, that the illiterate have potentially more memory than those who know how to read and write. We remember, moreover, better in the morning than in the evening, in the summer than in the winter, and better in warm than in cold climates. Memory is, therefore, to a certain extent, in inverse proportion to nutrition, and more than that, it is in inverse proportion to evolution, since it is greatest in those individuals who are the least advanced from an evolutionary point of view—inferior races, women, children, the feeble, etc. In short, according to M. Delauney, there is an evolution of the memory, which is first sensorial, literal, and then intelligent; but memory, properly speaking, diminishes inversely as the evolution.—*Medical Press and Circular.*

A Curious Freak.—A curious instance of partial loss of memory is mentioned in the French papers. A painter, who was visiting a friend at Sceaux, was standing on a balcony on the second floor, when he overbalanced and fell on the ground below. Every one rushed down stairs, expecting to find him dead, but he quickly picked himself up and seemed unhurt. When, however, he turned to address his friends, he could not remember their names. He had forgotten his own, and, to his utter astonishment, he also found that he could not recall a single substantive. He can pronounce, one after the other, the letters of which the names of his wife and daughter are composed, but he is unable to unite them into one word.—*Boston Traveler.*

Adulteration of Tin.—The adulteration of tin with lead, antimony, or other metals, is exceedingly prejudicial to health. Tin which contains lead should be proscribed entirely by the pharmaceutical world. The lead in the block-tin worm of stills finds its way into distilled waters of every description. Cisterns lined with tin that has been adulterated with lead, or contain that matter accidentally, are a source of danger to every one. Solutions, distilled waters, and other liquors preserved in such cisterns soon become charged with lead, which thus finds its way into the various pharmaceutical preparations made from them.

Insect Stings.—The pain caused by the sting of a plant or insect is the result of a certain amount of acid poison injected into the blood. The first thing to be done is to press the tube of a small key from side to side, to facilitate the expulsion of the sting and its accompanying poison. The sting, if left in the wound, should be carefully extracted; otherwise it will greatly increase the local irritation. The poison of stings being acid, common sense points to the alkalies as the proper means of cure. Among the most easily procured remedies may be mentioned soft soap, liquor of ammonia (spirits of hartshorn), smelling salts, washing soda, quicklime made into a paste with water, the juice of an onion, tobacco juice, chewed tobacco, bruised dock leaves, tomato juice, wood ashes, tobacco ashes, and carbonate of soda. If the sting be severe, rest and coolness should be added to the other remedies, more especially in the case of nervous subjects. Nothing is so apt to make the poison active as heat, and nothing favors its activity less than cold. Let the body be kept cool and at rest, and the activity of the poison will be reduced to a minimum. Any active exertion whereby the circulation is quickened will increase both pain and swelling. If the swelling be severe, the part may be rubbed with sweet oil or a drop or two of laudanum. Stings in the eye, ear, mouth or throat sometimes lead to serious consequences. In such cases medical advice should always be sought as soon as possible.

Brain Work and Brain Development.—According to the *Gazette des Hospitaux*, MM. Lacassagne and Cliquet have examined, by the aid of the *conformateur*, the heads of 190 doctors of medicine, 133 rudimentarily educated, 90 illiterate, and 91 prisoner soldiers, with the following results:

		Soldiers.		
Diameters.	Doctors.	Educated.	Uneducated.	Prisoners.
Longitud'l....	85.29	81.97	79.13	81.10
Frontal.....	48.91	43.65	42.25	41.12
Parietal.....	52.58	49.66	50.27	49.90

There is thus a considerable difference in favor of the doctors, and this is especially marked in the frontal measurements. Moreover, the two sides of the head are not symmetrical—in the educated the frontal region is more developed to the left, in the uneducated the occipital region is more developed to the right. The head is larger (more developed) in the case of the educated than in those of inactive intelligence. Among the educated the frontal region is more developed in proportion than the occipital; and if the difference is greater in the occipital it is very trifling, while among the illiterate it is considerable.

The Evils of Smoking in Early Youth.—It appears that the German government has seriously taken this matter in hand, as smoking is practised to a great excess by the youth of that country, so that it has been considered to have damaged their constitution, and incapacitated them for the defence of their country. In certain towns in Germany the police have had orders to forbid all lads under sixteen years of age to smoke in the streets, and to punish the offence by fine and imprisonment. Moreover, a Belgian physician has found, during a journey of observation and inquiry, made at the request of the Belgian government, that the too general and excessive use of tobacco is the main cause of color blindness, an affection which is occasioning increasing anxiety, both in Belgium and Germany, from its influence upon railway and other accidents, and also upon military inefficiency.

Domestication and Brain Growth.—At the recent meeting of the British Association, Dr. Crichton Browne gave an address on the influence of domestication on brain growth. He had found by experiments that domestication had greatly reduced the brains of the duck, and he argued that men, like ducks, might be fed and housed, fenced about, and exempted from participation in the life struggle, until, like the ducks, they would depreciate in mental capacity. Their bodies might increase in size and succulence, but their brains would become straitened and withered. Disease and luxury crippled the brains. It was as true as ever that men were perfected through suffering, toil, and conflict, and it was not through affluence and comfort that genuine civilization was attained. It was the civilization, not merely the domestication, of mankind that must be aimed at.

Best Antiseptic.—Prof. Klebs, of Prague, announces that the benzoate of soda is the best antiseptic in all infectious diseases. It acts, as the experiments of the author show, very powerfully. It is claimed that a daily dose of from 30 to 50 grammes to a full-grown man will render the poison of diphtheria inoperative. The benzoate is prepared by dissolving crystallized benzoic acid in water, neutralizing at a slight heat with a solution of caustic soda, drying and then allowing the solution to crystallize over sulphuric acid under a bell-glass. Large doses do not appear to be absolutely necessary. Good results may be obtained by the daily administration of about 12 grammes.

Cure for Burns.—An iron-foundry man recommends powdered pinewood charcoal as "a never-failing, speedy remedy" for burns and scalds.

MINING AND SCIENTIFIC PRESS.

W. B. EWER.....SENIOR EDITOR.

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The Week.

In spite of a dull mining share market, news from mining quarters are very cheering. The late rains have enabled some hydraulice to resume to a moderate extent, and the fast accumulating snows in the mountains justify a good supply of water for spring operations. The late rise in quicksilver, owing to floods in Spain and a deficiency in the market, gives hopes that our cinnabar mines will renew their activity with the realization of good profits. Iron has also yielded to the pressure of demand and gone up in the general rush. The congratulations expressed for the return of the English sales of iron to America, have been somewhat dampened by the revelation that the market happened to be bare of iron for a short time, and a moderate supply received from England was only temporary, and American producers rushed in with alacrity and stopped the importations. Lead also has felt the movement, and has been forced up, giving room for further and greater developments of the carbonate interests of Colorado. Although the supply of lead not being forthcoming to meet a sudden demand, its rise was not as prompt and steady as it might have been. Perhaps in all of the productions which are liable to sudden and peremptory demands, the motto of the producer should be "*semper paratus*"—always ready.

The inflow of gold from Europe continues, and European bankers are vainly endeavoring to devise means of stopping it. The Indians are committing depredations in New Mexico, and our exchanges of Montana are advising their readers to buy shot-guns, as well as more peaceful implements. In general, prosperity may be said to be returning, although slowly, and we feel confident it will be our pleasing duty to record hereafter increasing trade.

An Evil to be Remedied.

It seems to be an unfortunate characteristic of experts to "jump" at conclusions in order to justify preconceived opinions or theories. *A priori* reasoning founded upon assumption is very generally the basis of a multitude of opinions which are received in a more or less greater degree as they are in accordance with the desires of the individual seeking the opinion. The element of reasoning from assumption is a very general one in our mining operations. If not, there would be less error in the expert opinion bestowed upon the public. There is for instance a certain well-defined geological knowledge about mineral deposits and veins. Not every one, even a scientific geologist can, however, without careful examination, ascertain correctly whether a particular find is a mere surface deposit or a true fissure vein. The elements of nature are often perverse in their manifestations, and frequently deceive the eye of an expert. Knowledge certainly is increasing, but at the same time its glittering attendant, quackery, is not far behind. The disposition of individuals to run into abstruse theories is an advantage to that class of individuals who derive profit from the fact that mankind is engaged in a perpetual struggle towards the truth, and seize upon a semblance for the reality.

Why is it that there are so many and various opinions about the constitution of our mines? Why is it that on the one hand a mine is declared teeming with riches, and on the other hand declared to be a humbug? Is it the fault of science that so much uncertainty exists in relation to our mines, making it almost impossible to make a safe investment? It is more the fault of ingenious deceivers who, for a consideration, will give a scientific opinion as to the value of a mine, not intending to deceive, certainly not, but appending their names as scientific experts to a favorable report upon a mine in the entire, from an assay of a well-selected specimen of ore. It is easy to detect these imposters, but there is no law to punish them. They cannot be reached pecuniarly, being execution proof, and the criminal code is silent against their deceptions. It is a pity that the damage done cannot be remedied by some modification of our laws, or that preventive measures cannot be adopted.

In relation to the opinions of experts about mining, the Salt Lake *Tribune* in its issue of October 18th, remarks: "There are mining doctors with cabalistic letters attached to their names, who in practice, if not in theory, insist upon their ability to see further into a grindstone, or into an uncovered and unexplored mineral vein than any man who has not graduated from the school of the mining prophets, however extensive may be his practical knowledge of mines and mining. It is time that mere scientific assumption, unsupported by practical acquaintance with mines and mining, or by painstaking examination of the mineral properties upon which it passes judgment, should be treated by mining men and capitalists with the contempt it so justly merits. If the mischief caused by these scientific blunderers was confined to the dupes who employ them, nothing need be said; but the itching desire for notoriety, if not for golden ducats, which rushes into print with volunteer and unproved statements, to the disadvantage of particular mines or districts, affects whole communities, and deserves severe rebuke."

The *Tribune* is moved to these remarks by an alleged false report of the Bingham gold mines, made to the London *Mining Journal*. The principle we contend for, in regard to all such matters, is that although scientific education cannot be otherwise than valuable as a basis of observation, yet the line must be drawn somewhere, and theory combined with practice regarded as the only just criterion of valuable opinion.

It is admitted that our mining interests are of tremendous importance, yet there is scarcely any of the occupations of life left in such a chaotic, confused condition as our mining interests. Would not the mines and mining prospects of this region be advanced by getting rid of a horde of incompetent deceivers, who either blow our mines up as solid masses of precious metals, or run them down as worthless trash? We must strike a medium, and that medium may be very properly arrived at by the establishment of a regular school of mines, the mining engineers of which shall be experts in the true sense of the word, whose acts shall be supervised by the application of some such law as that now in force in this State with reference to medical doctors. In this case, the necessity of reducing the mortality rate, which had fearfully increased through the malpractice of incompetent quacks, was the main lever which moved the Legislature to adopt such stringent measures.

Next in importance to life stands the property, and it is not only policy but duty on the part of lawmakers to prevent its loss through the false representations which may be made by parties supposed to know the truth. There is no doubt but the purchaser must be on his guard; but if he has not the requisite ability to judge for himself, he calls in his own expert—who misleads him equally as badly as the seller. The abundant evidences which show the deceit and representation in regard to our mining interests show the necessity of some counteracting influence to protect the community who seek investment. Great injury has already been accomplished by the spirit of "*laisser aller*," and bad repute will certainly affect us in the future. If the law is competent to provide a punishment for the swindler of every-day life, it is abundantly able, by preventive enactments, to deprive the theoretical mining expert or swindler of his influence, and compel him to acquire proper knowledge of his business, or to drop out of sight.

Mining Laws and Regulations.

In early days in California when mining was confined merely to surface washing with the pan and rocker, it was found necessary to establish certain rules among the miners defining the qualifications of an individual worthy of holding and working a claim, and restricting the size of each claim, in order to give as many as possible a chance to reap the golden harvest. These rules were few and simple, and varied with circumstances in different localities. They were for the most part suggested by an innate sense of right and wrong and common justice, and were recognized and adopted by the common consent of the miners themselves and no other class.

These laws and customs appeared to work with such entire satisfaction to all parties concerned that they are even now sometimes referred to as models of legislative wisdom, but they were probably no wiser nor better than similar codes that would again be adopted under the same conditions. Their objects were extremely simple, and the individuals who made them and were governed by them fully understood those objects. In case of disputes, the parties disagreeing did not refer to a musty mass of precedents, but appealed first to their common sense of justice, and if that failed to settle it, a decision by arms was apt to be the next step, and, appreciating this, men were slow to inaugurate a quarrel. The defeated party in a suit of that kind never afterward complained of defective laws, while the victor, of course, had no occasion to; but could those who suffered injustice by our primitive mining laws rise and explain their cases, it is probable that our respect for those laws would be greatly diminished.

That style of enforcing laws has, however, become nearly obsolete, and as it faded out sharp practices grew apace. Dishonest shysters, no longer fearing the quick decisive arbitration of the revolver, were only too ready by ways that were dark to steal the property of the simple but honest miner and prospector. Not only has the tendency to summary justice died out, but all other conditions have greatly changed. Mining, from being but the temporary pursuit of a few thousand hardy adventurers who followed but a single branch of it in the most primitive style, has become the leading industry of a great people on this coast, and, as the time changed, the necessity of corresponding changes in the mining laws has been felt. The attempts of Congress to meet the requirements have been founded upon the necessities of the case, and have been partially successful. It was urged upon that body that the local rules and regulations that had always prevailed among the miners operated so satisfactorily that any disturbance of them would be injurious to the interests of the people, and this argument was given such weight that Congress, apparently fearing that it might conflict with established local customs, passed an act—the act of May 10th, '72—now alleged to be inadequate, to meet new questions constantly arising. Except, as to those sections relating to patents to mineral lands, the idea seemed to be merely to establish a few general rules for future guidance in locating and holding claims, while details were left to district laws to provide for.

As Congress has organized a public land commission, a part of the duty of which is to investigate the working of the present mining laws and suggest improvements, a consideration of some of the deficiencies of the present law is now of general interest. One of the most apparent deficiencies of the law as it now stands, is that it places no limit on the number of locations and the amount of mineral land a single person can hold. It does not even prohibit the same party from making two locations on the same vein. The consequence is that whenever any new mineral-bearing section is discovered, every piece of ground that has even a suspicion of value is immediately seized by the first comers and held for sale to those who may arrive later. It is not uncommon for a single set of men to hold from 25 to 200 claims for a whole year without doing a single stroke of work toward their development, the only item of expense being a matter of one or two dollars each for recording. The prices at which such claims have been held has usually been so high as to prevent new comers, even though they were men of means, from taking any active interest in the mines, and in this way many promising districts have been crippled in their infancy, or greatly retarded in their growth. Though it might not be advisable to restrict each man to a single claim in any district, yet the limit should be somewhere within reason. We do not allow one settler to monopolize all the agricultural land he can find, and there is no good reason why we should allow one miner to grab a large number of claims to the exclusion of others just as deserving.

In Section 2320 of the Revised Statutes, we read that "no location of a mining claim shall be made until the discovery of the vein or lode within the limits of the claim located." This at first glance would seem to be a good provision, but experience shows that there is a vast difference of opinion among men as to what constitutes a lode and its discovery, and as no penalty is attached to claiming a vein which is only supposed to exist, the clause is entirely inoperative. The mere cropping out of country rock or finding of a fragment of well-worn float, is often considered sufficient evidence to warrant the location of a vein. Indeed locations are very commonly made where no indications of a vein whatever exist, and the ground held in the hope that it may in some way become of value.

Another clause provides that claims shall be located and described by reference to some natural object or permanent monument such as will identify them, and that the boundaries shall be distinctly marked. But in this case also there is no practical remedy against a false or deceptive description. Notices are often recorded where the claimants have in reality not marked the boundary lines at all, or in which only vague reference is made to natural or permanent objects intended as boundaries. The object of recording them is very frequently the hope that valuable discoveries may afterwards be made in the near vicinity, and the defective claims floated over them.

The provision which allows a locator one full year in which to make $100 worth of improvements, is usually accepted in district codes of law as being a proper and easily complied-with measure, but it is altogether too liberal and gives the speculator too much chance. At least that amount should be put on during the first three months, so that claims could not be held for considerable time for nothing and delay active mining.

But our troubles, after all, are not so much the result of defective laws. The few changes hinted at above are perhaps all that are needed in reference to locating and holding veins. The greater difficulties lie in the facts that there is a large class of men disposed to be dishonest, and that incompetent and careless men are too generally put in office, so that laws, which are good and sufficient in themselves, fall to the ground through lack of proper administration.

We cannot enforce a law requiring all men to be honest and conscientious, and when they become so we will hardly have need of any law. But we certainly can have laws which will protect the miner against the irregularities of official acts. As it is now, if the official neglects his duties the claimant is the sufferer, because the Government repudiates official delinquencies.

A Visitor from Alaska.

We had the pleasure of a call from E. Conklin, of New York, the representative of the American Press Association, who has just returned from a trip to Alaska. Mr. Conklin describes the scenery along the route as of surpassing beauty. The steamer is kept in a channel near the main land, and the voyage seems more like that along a beautiful river, narrowing in sometimes between high and woody cliffs, and then widening out into the semblance of a beautiful placid lake, fringed with timber and green-clad hills. Mr. Conklin says that there exist many errors about Alaska, both as to climate and resources. For instance, the Bay of Sitka is generally represented in pictures with natives spearing walruses, and a back ground of tremendous icebergs; a fancy picture for this reason that icebergs and walruses are unknown there. Root crops are grown to perfection. Potatoes were shown him weighing three-quarters of a pound each and 30 in a hill.

The thermometer last winter did not get below +11°, which is much warmer than New York. The Kuro Siwa, or warm Japan current which flows through Behring's straits into the Arctic ocean, exerts an astonishing influence upon the climate, the isothermal line of which would probably be about the latitude of Philadelphia.

Thirty miles from Fort Wrangel up the Stickeen river, exists the only living glacier in America. It is fully 60 by 20 miles, and its progress may be watched from day to day. The whole country is immense and its climate varied. The climate of the frigid zone may be found away to the northeast, while that along the coast is moderately temperate, the interior varying as the influence of the sea diminishes. The mines are about 2½ miles from Sitka and are regarded as true fissure veins, the ore is, however, low grade. The mining is generally by means of tunnels run into the sides of the mountains. Probably 500 miners are engaged in mining, which can easily be carried on for five months of the year. Sitka is a general rendezvous for the population, which is of a floating character, prospecting in the summer and returning to the town in the winter.

A regular trade is springing up between the Pacific coast and Alaska, and its resources are gradually assuming great commercial importance. Mr. Conklin, in a new work entitled "Picturesque Northwest," to come out in May, will fully describe this region and introduce some valuable engravings of scenery, etc.

THE miners on a strike at Charleroi, Belgium, are returning to work, the Socialists advising them to defer the strike until the men in all the pits can join it.

Late Decisions under Mining Laws.

The Acting Commissioner of the General Land Office, M. Armstrong, has issued instructions to the Land Offices as follows. "You will refuse to receive any papers certified, sworn to or subscribed before a notary public who is United States deputy surveyor—mineral or others."

The reason of the instruction, which must be regarded as a "ruling," arises from the fact that the Legislature of Montana has authorized the Governor to appoint United States deputy mineral surveyors as notaries public in matters pertaining to mining claims, public or private lands, etc., the Surveyor General applied to the Commissioner of the General Land Office to know what he shall do about it, Acting Commissioner Armstrong responds in no equivocal terms that the thing cannot be done.

Section eight of the act of Congress entitled, "An Act to provide a temporary government for the Territory of Montana," approved May 26th, 1864, provides: "And no person holding a commission or appointment under the United States except postmasters, shall be a member of the Legislative Assembly or shall hold any office under the government of said Territory."

The deputy surveyors are amenable through the Surveyor General to the supervision and control of the General Land Office, and are clearly officers by appointment under the United States, and the office of notary public is an office under the government of Montana Territory.

The offices are practically antagonistic, as it was probably intended that the offices of the United States should be under the exclusive supervision of the Government, which would not be the case if holding a State or Territorial office. The act of the Legislature of Montana is in plain violation of said law of the United States, said Territorial Legislature is not only in excess of the power granted, but in direct contempt of an express prohibition.

The decision in the case of the protest of Central City, Golden Gate and Archer City (all said to be portions of Deadwood, Dakota), against the application for patent of James Pierce *et als.*, to a placer claim, is a protection for mining lands as against town sites. The Acting Commissioner in his decision says:

"I am of the opinion, from the testimony, that the land involved should properly be claimed as valuable for minerals." The testimony in the affirmative is direct and explicit, while that in the negative at the most but denies that the land is sufficiently rich to be worked with profit, and is based upon statements made to witnesses by third parties.

It appears from the decision of the Secretary of the Interior, *in re* Thomas Starr to enter as placer mining certain tracts in Leadville, Colorado, that the land should, under the provisions of Section 2318 Revised Statutes, be held as "valuable for minerals," and should be reserved from sale except as provided by law regulating the sale of mineral lands, and said: "In my opinion, the evidence submitted as to the relative value of the land for town sites or mining purposes was improperly allowed. If the land was mineral, it was subject to location under the provisions of the mining law, without reference to the relative value of a portion of the tract for township purposes."

This decision, says the Acting Commissioner in the Deadwood case, relates to placer mining ground only. A different rule obtains under the Statute and the decision of the Department in the case of town sites located on lode claims, and in such cases reservations are inserted in the respected patents. The land in question in this controversy is plainly mining ground and valuable as mineral. "I decide that it is not subject to town-site entry or to any disposition whatever, except under the provisions of the mineral law. I conclude that the patent in this case should be dismissed, and the land held subject to sale as mineral, with 60 days to appeal from this decision." The Acting Commissioner also decided recently the following points:

All lands belonging to the general Government in Missouri and Kansas are subject to being entered as agricultural lands.

Lands containing valuable deposits, except in veins of quartz and rock in places, are subject to being entered as placers.

No locations of mining claims can be made on the Petaca Grant, or any other land held under Spanish or Mexican titles obtained before annexation.

The patent approved and issued last May to Jose P. Azivida, for W. ½ N. E. ¼ 32, and N. W. of N. W. ¼ 33, 2 N. 14 E., at Stockton, California, as agricultural land, has been withheld for investigation at the instance of W. Gaynore mining company, upon an allegation not only that it is mineral, but that it has been worked as mineral land for 15 years.

A party who discovers and locates a mineral claim, and subsequently makes another discovery on the same claim, or finds lode number two to run across his first location, can locate the second claim and hold both, there being no conflict with other parties at date of location; or he can abandon the original location and make another, in case the new vein discovered falls outside of his first claim. The above opinion was given in a Utah case, where the discovery of the second lode was within the limits of the first location.

It is proposed to offer in Congress an amendment to the land laws, so as to make an individual caught in the attempt to obtain Government land by false representations forever disqualified as a pre-emptor under the homestead or any other law.

Indian Peculiarities.

The aborigines found in America by the discoverers were termed Indians, because the objective point in voyages to the West was India, and hence when the Western Continent was discovered it was hailed as the long-sought-for country of fabulous wealth and mystery. In many respects the manners and customs of the Indian tribes showed evidences of a tradition which must have descended to them from the human race in Asia. Their religion, theory of origin and acquaintance with the events related in the Bible, and of general mythological belief among the Asiatic nations, show a remarkable similarity. One element in Indian customs remarkable for its similarity to the peculiarities related of the more civilized nations of the old world, is that of dancing upon occasions of joy, sorrow or war. In all, however, there is a natural grotesqueness which is supposed to indicate the ideas thought to be indicative of the sensations or of preparation for some important event. The feeling is natural, even the white man is desirous of "dancing for joy," and uses the expression, when the Indian practically demonstrates it.

The solemn religious dance of the Hindoo

INDIAN WAR DANCE.

finds a parallel in the sun dances of some of the Indian tribes, and is even perpetuated in the dancing feature common among the Shakers of civilization. In the war dance of the Indian, which we illustrate on this page, the grotesque and horrible form a dreadful accompaniment which even to a savage mind can be excused only by the dread uncertainty of the war to follow the uncouth ceremony. The devil is particularly materialized for the occasion and the enemies of the tribe turned over to his domain, while the wild bull of the happy hunting grounds is propitiated in the hope that his prototypes in the opposing camp will become the loot of the victors.

Very much of the Indian character and origin may be learned from the meaning of even the simplest dances. David danced before the ark, and perhaps the savage dancing before the image of some unknown divinity, demonstrates an origin which the most profound researches of scientific men in regard to prehistoric remains dare not contemplate.

ATTENTION is called to an important advance in refined sugar and syrup. Local refiners are keeping up with the advance in the New York market. They now have the field well in hand.

IN San Francisco half dollars are quoted at 99¼ buying 100 selling; trade dollars, 95 buying, 96½ selling; Mexican dollars, 91 buying, 92 selling.

GENERAL MERRITT has been ordered from Washington to suspend operations against the Utes, pending negotiations for peace.

Recent Decisions Relating to Patents, Trademarks, Etc.

U. S. Circuit Court, Western District of Pennsylvania—Couse & Blood vs. Johnson, Black & Co. Decided Sept. 25th, 1879.

1. The claims of a patent ought not to be expanded constructively beyond the limitations which the patentee has imposed upon them so as to cover subsequent improvements in an art in which the invention claimed was, at most, only a step in advance.

2. The patentee's exclusive right is enforcible only within the limits of his own definition of it.

3. Where a claim is not limited to a particular form or construction of device, and the specification does not assign any peculiar merit or claim any new result as the product of its conformation, such form cannot be considered as an essential part of the invention.

4. Where the subject of a claim is of doubtful patentability, and the specification vague with regard to it, the patentee cannot make a valid claim for it.

5. The application of old mechanical devices, without material change, to a use in which they were not employed before, but which was known and had been practiced, does not constitute a patentable invention.

6. The use by complainant of kerosene oil in a stove by means of prior devices is not patentable, even though such prior devices were intended for use as illuminating-lamps, in which alcohol or other combustible fluids were to be used.

7. The air chamber below the burner and around the wick-tubes of an ordinary lamp, although contemplated to supply the burner with air, also prevents the heat from being thrown upon the oil-holder, and hence anticipates a claim for an air chamber for that purpose in an oil-stove, between the oil-holder and the stem.

8. When the thing complained of as an equivalent of the thing patented cannot be used as directed in the patent, and its use as there directed would render the patented thing inoperative, it is not an equivalent and not an infringement.

9. The use of water on top of the oil-reservoir, to intercept the heat from the burner, is not an infringement of a claim for the use of a non-conducting packing in the air chamber of the burner for the same purpose.

10. The insulation of the oil-holder of a stove, by making the legs of the stove long enough to allow the lamp to be placed under it without touching, is not invention, and does not require ordinary mechanical skill to devise.

11. The placing of the legs of an oil-stove in a trough of water on top of the oil-holder, to intercept conducted heat, does not infringe a claim for insulating the oil-holder from the stove by the non-contact of the parts, to prevent the passage of conducted heat.

U. S. Circuit Court, Eastern District of New York. Cammeyer, *et al.*, vs. Newton, *et al.* Decided March 19th, 1879.

1. A reissue to be valid must be for the same invention contained in the original patent, and when, in a suit between the same parties, the Supreme Court of the United States had decided that the defendant's apparatus did not infringe a valid reissue thereof, and the suit was accordingly dismissed.

2. The omission in a reissue of an element essential to the invention as originally described and patented, is fatal to the reissue.

3. Reissued patent No. 6,249, granted to Samuel Lewis, Jan. 26th, 1875, for improvement in apparatus for removing obstructions under water, is invalid.

U. S. Circuit Court, District of New Jersey—Spring, *et al.* vs. The Domestic Sewing Machine Company. Decided July 17th, 1879.

1. A decree by the court, made at the request and in accordance with an agreement of the parties litigant, not effective against others not parties thereto.

2. A decree by consent of parties litigant should have very little weight in any court, when produced as an adjudication in favor of the validity of a patent.

3. Two years' use by defendant of the complainant's patent, with the latter's knowledge, who took no steps to stop it, is sufficient to defeat a motion for a preliminary injunction.

4. Complainants are chargeable with the laches of the former owners of the patent, having succeeded only to the rights of such former owners.

The New Davis Crusher and Pulverizer.

In company with the inventor, Mr. John T. Davis, we visited this week the Golden State and Miners' foundry, to examine the new form of crusher and pulverizer to be seen at work there. The machine is an ore crusher and pulverizer combined, and has three distinct motions combined in one—the *eccentric*, the *rotary* and *vibratory;* and by this combination a large amount of work is done with a small machine. The ore is fed in at the top, through a hopper, and passes down through the machine and out at the bottom, where it drops on a screen, which regulates the fineness, the coarser particles going back into the machine with the broken ore. The machine in operation will take in pieces 4 inches square.

We saw the machine working dry, but the inventor says it works quite as well with water, so that it will meet any case, but will do the most work in a dry state. It can be made cheaply, so that any person having a good ledge of ore can arrange to have it put up on their mine. It will be especially useful for such mines as are at a distance from a large supply of wood or water.

The machine will weigh about 2,500 pounds, and cost about $500. The body is strongly made, and so arranged that the shoes and dies are easily replaced—a full set costing only $4. An automatic lever attached to the machine enables the operator to grind the ore to any desired fineness, from the size of a bean to a No. 90 screen—an advantage of great utility in working sulphurets or preparing ore from leaching. Mr. Davis has devoted much time to perfecting a machine which will meet the wants of the mining community, and those interested in such appliances may see this one at work at the foundry named, on First street, near Folsom. We shall shortly give an engraving of the machine, with fuller details of its construction and operation.

UNITED STATES GEOLOGICAL SURVEY.—A circular letter, dated Oct. 20th, 1879, has been issued by G. F. Becker, Esq., Geologist in charge of the Survey at San Francisco, which says: A main object of the United States Geological Survey is to advance the knowledge and practice of the mining arts by investigation and description of the occurrences of ores, of the methods employed in mining them, and of the processes by which they are treated. Every mining district will receive the attention of the Survey; the information obtained and the results of special investigations will be so presented as to afford a trustworthy record of the mineral character of the country and of its resources, and of the methods of manipulation which have proved most suitable under varying local conditions. Each district will therefore receive the benefit not only of the labors of the Survey within its limits, but of the collective experience of the whole country. Mr. Becker, very properly, requests the co-operation of the newspapers published west of the Rocky mountains, and desires his office to be placed on the free list, as the expense of subscribing to all the papers necessary and desirable for correct information is greater than the Survey can afford. Suitable acknowledgements of courtesies extended to the Survey will be made. We believe there will be a united effort on the part of local newspapers to comply with this desire, as it is the most effective means of gleaning accurate and complete information. We may state in this connection that Dr. Becker has very recently ordered for the Survey a complete set of bound volumes of the MINING AND SCIENTIFIC PRESS—making 38 volumes in all—which he desires to keep on hand for reference and as a full record of mining events in this country.

IN New York Government bonds are quoted at 102½ for 4s of 1907; 103⅜ for 5s of 1881; 105¾ for 4½s; sterling, $4.81½@$4.83½; silver bars, 113½; silver coin, ⅛@1 discount.

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Our Associates and Correspondents are the Best Practitioners in every country where Patents are granted.

For Foreign Patents no model is required, as a rule, except in Canada. The Specifications and Drawings of the American Patent, if complete and perfect, will suffice for us to prepare the case. In Great Britain and other countries we apply for patents in the inventors' own names, thus avoiding their being published to the world in the name of a foreign agent, as is usual through other and less painstaking agencies.

Frequently several inventions, covered by different patents in the United States, on the same subject, can be skillfully combined in one patent in foreign countries, when well understood by intelligent attorneys.

As the privileges of our inventors are cut off in *some* countries, and curtailed in others, if not applied for soon after the issue of the U. S. patent, we advise inventors whose patents will be valuable in various populous civilized countries, to lose no time in applying for patents whenever they intend to obtain them for themselves or the benefit of others—with their own means or through the resources of those who are permitted to share the benefits. It must be remembered that the English (and some other important nations) invite the early introduction of inventions into their realms, by offering patents to the first *introducer* (which means the first *applicant*), without regard to the rights of the *actual* inventor, who has no after recourse.

For important inventions it is best to apply for foreign patents at the time of application for or before the issue of the U. S. patent.

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Australian Colonies:	
Victoria	14 years in successive periods, 3, 4 & 7 yrs.
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New South Wales	7 to 14 years
Queensland	7 to 14 years
New Zealand	Full term, 14 years
Austria	15 years, by annuities.
Argentine Republic	25 years or more, determined by gov't.
Belgium	20 years by annuities.
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Denmark	5 to 20 years, at the option of governm't.
England	14 years, in successive periods, 3, 4 & 7 yrs.
France	15 years, by annuities.
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Italy	12 years, by annuities.
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Mexico	Full term, 10 years
Norway	5 to 10 years, at the option of gov'm't.
Portugal	Importation 5, Invention 15 years
Peru	25 years or more, determined by gov't.
Russia	Importation 1 to 6 yrs, Invention, 3, 5, 10 yrs.
Spain	Importation, 5 yrs, Invention 5, 10, 15 yrs.
Sweden	3 to 5 yrs, at the option of government.

We have the Foreign Patent Laws, Foreign Patent Reports, and other valuable and assisting documents, for ready reference in our MINING AND SCIENTIFIC PRESS Patent Agency Library—the most complete Patent Library on this side of the Continent.

The cost of patents in any one or more of the above countries will be furnished on application to us.

Any further information regarding the time within which patents must be worked in any foreign country, time of payment and amount of annuities for patents in any of the above countries, will be cheerfully given on application.

Full particulars regarding any countries not named above, will also be given when desired.

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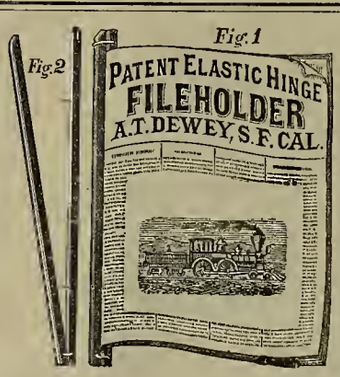

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Copp's Hand-Book of Mining Laws.

Henry N. Copp's hand-book of mining laws, just issued, contains the United States mining laws and instructions thereunder, a digest of decisions, forms, list of mining patents issued, etc. The digest of decisions alone is a very valuable thing, giving, as it does, in brief form, all the decisions of the Secretary of the Interior and Commissioner of the General Land Office in relation to mining matters. These are all under proper headings for easy reference. Forms are given for notice of location, proof of labor, notice of forfeiture, miners' lien, application for survey, patent, etc., affidavit of improvements, etc. There is also a list of patents issued for mining claims from July 20th, 1866, to August 1st, 1877. The book is of pocket size and very convenient for all who are interested in mines. It will be sent post-paid for $1, on application to Dewey & Co., 202 Sansome street, San Francisco

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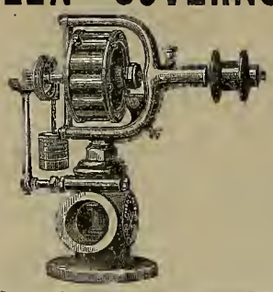

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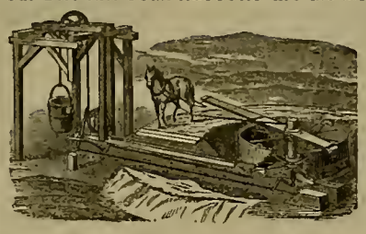

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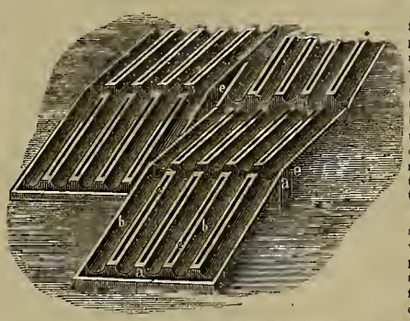

This invention meets a want which has long been felt by Gravel Miners and Millmen, viz.: that of a simple, cheap Riffle which will save the largest possible amount of gold or sulphurets, with the least possible waste of quicksilver. That this Riffle answers all these conditions will be apparent to any practical man who takes the trouble to examine it. The arrangement of this Riffle is such that there is a strong, unobstructed upper-current to carry off and break up the gravel or cement, and a slow under-current, checked by numerous riffles, which give gold or sulphurets a better opportunity of settling than if they were exposed to the force of the main current.

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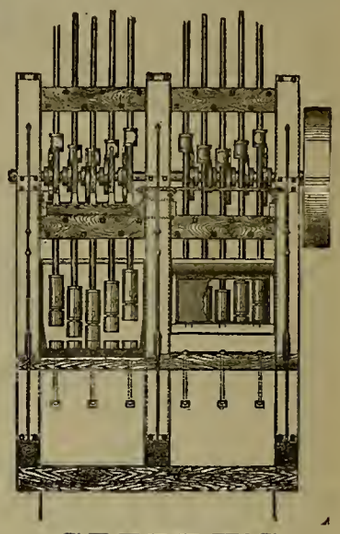

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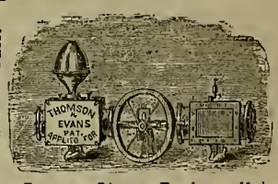

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[CONTINUED FROM PAGE 261.]

I. X. L. DISTRICT.

NEW MINES.—D. R. Sessions, in the Carson *Appeal*, says of this new district: Good mines have been found in Churchill county, in a range of mountains 12 miles west of La Plata. One miner ran a tunnel 20ft long and struck a ledge 30 ft wide, which has not yet been penetrated. Some of the ore is pure silver. There is an abundance of wood and water in the vicinity. Since the discovery of that mine, eight square miles of timber have been taken up. There are now about 59 men at that place, principally from Eureka.

PARADISE DISTRICT.

MARTIN CREEK.—The editor of the *Reporter* visited the Paradise Co's new mill at this point and pronounces it one of the finest and best regulated ten-stamp mills on the coast, producing bullion at the rate of about $1,000 or $1,200 per day, with room to add ten more stamps, if necessary, which will undoubtedly be the case, should the Paradise mine continue as rich in the future as it has been in the past. The machinery is all working splendidly, and the mill is being run to its full capacity, day and night. There is enough ore on hand and at the mine to keep the ten stamps in constant operation for six months, and it is the intention of the company to run the mill and mine for all they are worth the coming fall and winter.

SOUTH MOUNTAIN DISTRICT.

A PROSPEROUS CAMP.—The *Silver State*, published at Winnemucca, Nevada, with reference to this district, informs us that Thomas J. Taylor, an experienced miner and smelter, who went from Eureka to South Mountain to examine the mines of that section, and, if favorably impressed with their appearance, to start a smelting furnace to reduce the ores, arrived here yesterday on his way home. He is of the opinion that the mines are rich and permanent, and that South Mountain is destined to be a great producer of base bullion. A furnace is successfully running on ore from the Mono, and he thinks there is ore enough to keep it running until a tunnel, which is now being run, cuts the ledge, after which he thinks there will be no trouble in getting plenty of ore. The first shipment of bullion was made from the furnace Saturday. It consisted of 10 tons, which assays $665 in silver to the ton. Another shipment will be made this week, and, as the furnaces are running splendidly, it is expected that shipments will be made regularly henceforth. Mr. Taylor believes that South Mountain is destined to be a lively camp, and that it will be one of the greatest base bullion producing districts on the coast.

SPRING VALLEY DISTRICT.

EAGLE MINE.—*Silver State:* This mine has been incorporated as the Vandewater G. & S. M. Co. It is located in Humboldt county' 13 miles from the C. P. R. R. The company owns altogether 14 well-defined ledges, all prospected sufficiently to determine their value. In addition to these ledges, it owns a water right which is very valuable, and which is expected to yield a profit of $50,000 or more per year from the sale of water. The company owns a 15-stamp mill, and all the outbuildings and other appurtenances of a first-class and well equipped mine. Within six miles of the mill is a salt marsh, from which all the salt needed is obtained at the cost of hauling only. There are several hundred Chinamen washing gold in the canyon, which divides the property of the company. These Chinamen have, during the last five years, taken out over $1,300,000 in gold—not placer gold, but fresh quartz gold—which establishes the fact that the gold of the canyons has but recently been washed from the hills on either side of the canyon, and must have come from the different ledges owned by the Vandewater company. There is sufficient ore exposed in the company's mines to run the mill (with 25 stamps—10 new stamps are to be added) for five years, such ore yielding $30 per ton, and the cost of milling being less than $7 per ton. A new vein parallel to the Eagle has been discovered within the last fortnight, very wide and well defined and very rich. This new discovery is what is known as a blind lode.

PIOCHE DISTRICT.

DAY MINE.—*Record*, Oct. 18: The last official letter of A. S. Gould, Sup't, says: Our work of sinking in the ore body from the lower tunnel level is being driven with all possible energy. We meet with some spar boulders, but the ore continues strong, and of about the same character as per my last report. We find streaks and bunches of a very nearly jet black, soft earthy material, which assays $172.79. Our average assays from the sides and bottom of ore shaft is $125.58.

HILLSIDE MINE.—Forty-five tons of ore are daily shipped down to the furnace, which started up the fore part of this week and is doing good work, turning out a large amount of bullion.

RAYMOND & ELY.—Mr. Mill, Sup't, says: The ore on the 11th is improving as we work up; in the drift we are still in good ore; we have been raising from 11th to 10th and expect soon to make a connection; we are running a cross-cut to make a connection with upraise from 11th and expect to get into a body of ore which may prove to be a different vein than we ever had. We are sinking a winze on the 1000-ft level in a body of low grade ore, and expect to take out a large quantity of ore at this place. Samples from top of upraise go from $100 to $150. Prospects, as we go up, seem to look more favorable.

WILLOW CREEK DISTRICT.

PLACER MINES.—*Silver State*, Oct. 13: H. H. McColly informs us that the Chinese who are placer mining on Willow creek, are doing well, considering the scarcity of water. They do not average over three hours' work each day, yet they make what Chinese call "good wages." Mr. McColly brought down 14 ounces of gold dust, taken out by the Chinese, and sent it to the mint to be assayed.

ARIZONA.

GLOBE DISTRICT.—News from this district in the *Silver Belt* report that ore worked in the Isabella mill for Wilson and Gibbons from their Centennial mine gave $965 per ton. The Mexican mine now has a well-timbered working shaft 70 ft deep. The shaft is not on the vein, and ore body not yet reached. Cox & Coplin are now drifting from their deep shaft towards the main vein and at the same time taking out rich ore. The vein is strong and looks well for a continuance. They are putting up commodious winter quarters.

HUACHUCA.—The Tombstone *Nugget* says: There are now three live camps in the mountains, one at Hartford, one at Ash canyon, and one at the south part of the mountains, with probabilities of some more. Recent discoveries of new veins are creating much interest, and some excitement. Some of these new discoveries are said to be 30 ft wide of croppings and a mile in length, at any point of which rich ore can be found. Some of these are in a gangue of quartz, with indications of its being a vein of free-milling rock, and others of being rich lead ores for smelting. None of them have as yet been developed enough to disclose their true class and character, but enough is shown to prove them to be fissures cutting the formation in their strike. Work is progressing and assays are being made. Andy Baldridge is in town from Mule mountains, where he has discovered some new mines. Assays made by A. J. Mitchel show the ore to be worth $238 per ton. Andy claims that he has a lead which contains 40 ft in width of better ore than the sample he had assayed. The claims lie to the east of the Mule Pass and are entirely new to prospectors.

COLORADO.

CENTRAL CITY.—*Register-Call*, Oct. 17: Rich gold discoveries have been made in the Big Horn mountains, about 25 miles northwest of Fort McKinney.

ITEM.—The Georgetown *Miner* publishes a private letter from Battle mountain, on Eagle river, which says a number of rich strikes have been made in that locality, in one claim 25 ft of mineral having been uncovered. The contact can be seen cropping out all along the face of the mountain. The formation is lime, porphyry, iron and quartzite, exactly the same as at Leadville.

IDAHO DISTRICT.—The *Iris* says that in regard to the Idaho tunnel, since the first lode was cut, at a distance of 48 ft from the mouth of the tunnel, successive lodes have been found at every 25 ft, the last lode cut showing a strong mineralized vein six ft in width carrying sulphurets assaying three ounces in gold and 118 ounces in silver, and a narrow vein of gray copper on the hanging wall assaying half an ounce in gold and 510 ounces in silver. The last lode discovered in the Idaho tunnel, called the Beta, bids fair to prove a bonanza of itself, and the entire enterprise in its great value is fully established. The Hub mine has been taken possession of the past week by E. E. Mack, and a force of men put at work in the shaft and the different drifts, and mineral of a high grade being brought out in large quantities. Shifts have also been placed in the adit already started, which is to cut the shaft at a depth of 150 ft. Another adit is being started in Boomerang gulch which will cut the shaft at a depth of about 400 ft. The town of Idaho Springs is becoming a permanent mining camp.

IDAHO.

SNAKE RIVER PLACERS.—*Enterprise*, Oct. 16: While at Blackfoot City a few days ago we paid a visit to the placer diggings of Lawrence & Holmes, some two miles or so southwest of town. They are running two set of plates, silver-plated and manufactured by the Gorham Manufacturing Company of Connecticut. They have taken out a ditch from Blackfoot creek which supplies them with plenty of water for running a dozen plates more than they have. From this main stream they have lateral ditches running over to the bank of Snake river where they have the plates set. Water is turned on through these lateral ditches, which wash the dirt, sand and gravel through a flume and over a sieve which carries off the coarser material while the gold and finer sands wash through on to the plates, the gold adhering to the plates and the sand and dirt washing away. Mr. Holmes cleaned up from the two plates while we were there about 10 ounces of amalgam, valued at about $0 per ounce, as the proceeds of one day's run. This is done with the labor of two men we believe, so that they can say truthfully they are making from $25 to $30 per day to the hand. With improved facilities they can increase upon the quantity of gold saved. The gold is of the flour gold variety, very excellent quality and no end to the quantity of it.

ADVANCE IN IRON.—Although we are not producers on this coast of such articles as iron pipe, sheet iron, nails and other articles of the same class, and the prices in this market are controlled by those at the Eastern manufactories, yet we may regard the late advance in the price as an evidence of prosperity, which is returning to the country in general, and is making itself felt on this coast. Messrs. W. W. Montague & Co., of San Francisco, in a letter, speaking of the matter, say: In the early part of July the first signs of an advance in the iron market were visible. No great advance took place until the latter part of August. The first week of July pig iron was selling in New York at $18.50 to $19 per ton for foundry, and to-day it is difficult to obtain the same grade of iron at $30, an advance of 55%, with a prospect of its reaching $35. Never before in the history of the iron trade of the United States has the advance been so sudden, so rapid and so great in such a short time. The question asked: What has caused this enhancement of values? Demand, which is far in excess of supply. What has created such a demand? General prosperity in business. After six years of the most extreme commercial depression throughout the country, the United States may be said to have fairly entered upon a new era of prosperity.

PRECIOUS METALS IN CANADA.—The Montreal *Witness* says that a few years ago Gen. Baker, then Surveyor-General of Minnesota, explored the region round Northern Light lake, north shore of Lake Superior, and became convinced of its richness in gold and silver. Afterwards he formed a company, which has had 16 experienced miners at work all summer uncovering veins of mineral. On the Canadian side, near Arrow lake, vein-matter about 30 feet wide was uncovered, and through this run four seams of rich mineral, one, 1 foot wide, two, 2 feet wide, and a fourth, 15 inches wide; one of the 2 feet mineral-bearing seams at a depth of 14 feet, showing a width of 5 feet, while the miners are fully satisfied that the mineral seams all come together at a depth of 50 feet. The seam in which the shaft was sunk already shows masses of mineral that are simply incredible for the depth reached—only 14 feet. The ore is of that species known as gray copper, and carries both gold and silver. It was assayed by Prof. Peckham, of the Minnesota State University, and showed $49 in gold and $57 in silver per ton. One of the best indications is that the ore is evenly diffused throughout the whole mineral matrix. The new mining district is 300 miles southeast of Emerson, and 50 miles due north of Grand Marais, a Minnesota harbor on the north shore of Lake Superior.

THE visiting Governors at Philadelphia visited the old Christ church Sunday, which Washington attended while President.

UNEASINESS is expressed at New York for the safety of vessels exposed to the hurricane on the Atlantic on the 10th inst.

THE restrictions against newspaper correspondents accompanying the British army in Afghanistan have been withdrawn.

New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's office at San Francisco:

COAST RANGE M. Co.—Object, to operate in Marin county. Capital stock, $10,000,000. Directors, Edgar Briggs, A. Peck, F. W. Bowen, George T. Emery and E. A. Peck.

SAN RAFAEL M. Co.—With like objects, capital stock and Directors.

THE "SUN" PUBLISHING Co.—Capital stock, $10,000. Directors, Oscar W. Dunbar, J. H. Delahanty, John Freel, Edward C. Ellinghouse, James A. Cowles, Frank T. Jordan and Daniel Connell.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

[FOR THE WEEK ENDING OCT. 14TH, 1879.

220,522.—DRAIN AND OTHER PIPES—John P. Culver, S. F.

220,527.—YEAST COMPOUND—J. H. Goll and A. Spiuner, San Francisco.

220,536.—FORMATION AND BENDING OF POTTERY PIPES—Wm. B Hyde, Oakland, Cal.

220,630.—DUMPING WAGON—A. McFarlane, San Bernardino, Cal.

220,542.—IMPLEMENT FOR GRAPPLING, WITHDRAWING AND PERFORATING PIPES AND TUBES IN ARTESIAN WELLS—B. F. Mull, Merced, Cal.

220,656.—GOLD WASHER—Wm. H. Pillsner, Elko, Nev.

220,559.—GAS CHECK FOR WASTE AND SEWER PIPE—Wm. Wilson, Oakland, Cal.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

AUTOMATIC GRIP FOR ROPE-RAILWAYS.—Henry S. Grace, S. F. No. 220,283. Dated Oct. 7th, 1879. This invention relates to an improved apparatus for connecting a car with the continually-moving rope or cable by which it is to be driven; and it consists in the combination of two gripping devices connected with each other and with a mechanism within the car to be propelled, so that when one grip is released, the other, which follows or is behind the first one, will be caused to take hold, and *vice versa*—the object being to enable one cable-road to cross another one without entirely disconnecting the car from the cable which drives it. This device also enables the cars to be used with a cable which turns a corner, as the grips are easily detached and the momentum will carry the car around the corner, where it again meets the cable and connects with it.

WATER WHEEL.—David H. Anderson, S. F. No. 220,212. Dated Oct. 7th, 1879. This invention relates to an improvement in that class of water wheels known as "hurdy-gurdy" wheels, which are driven by the momentum of the water, and in which the water is received into the buckets from the outside and discharged in the same manner. It consists in so mounting the buckets or floats on the flanges or rim of the wheel that a continuous span is left between the inner edges of the buckets and periphery of the wheel, so that the momentum of the water is not lost on the first bucket, but is distributed over a number, until its moving force is entirely lost, when it leaves the wheel.

ROTARY ENGINE.—B. E. Letang, San Leandro, Cal. No. 220,246. Dated Oct. 7th, 1879. This invention relates to an improved rotary engine, and consists in attaching to a shaft a series of peculiarly-shaped pistons arranged in a circle on the shaft so as to rotate it, as steam is applied to one side of said pistons. This engine is very compact and light, occupying very small space and requiring less steam than reciprocating engines. As the steam acts on three or more of the pistons at one time, all on one side of the shaft, great power is obtained and direct rotary motion imparted to the shaft.

COMBINED STEAM HARVESTER AND THRESHER. Wm. H. Foye, S. F. No. 220,366. Dated Oct. 7th, 1879. This invention relates to an improved apparatus for harvesting grain, and it consists in a novel combination of a mechanism for cutting and heading the standing grain, suitable carrying and elevating belts, and a threshing and cleaning machine, all mounted upon a frame-work having bearing wheels, together with a novel steering device and devices for raising and lowering the front and rear and the ends of the reaper. In combination with these devices, an engine is employed to drive the sickle and thresher, so that, while the machine is drawn over the field by horses, the reaper and thresher are driven by this engine at any speed required, and independently of the movement of the machine over the ground, thus cutting thick or thin grain with equal facility and relieving the team, as the tractional force necessary to drive the machine is avoided.

STEAM FARMING APPARATUS.—Wm. H. Foye, S. F. No. 220,365. Dated Oct. 7th, 1879. This invention relates to certain improvements in engines and apparatus for farm work, the apparatus being interchangeable, so that portions of it may be employed with the engine during the plowing season, while other portions may be employed with the same engine during the harvesting season, by simply removing the plowing apparatus and substituting therefor that necessary for harvesting, so that the whole will form a comparatively cheap and economical "plant" for all the principal work of a farm.

DOUBLE-ACTING REVERSIBLE GANG PLOW.—Wm. H. Foye, S. F. No. 220,367. Dated Oct. 7th, 1879: This invention relates to certain improvements in gang plows of that class which are hauled across the field to be plowed by means of engines placed at one or both sides of the field with suitable anchors and connecting and operating ropes; and it consists in mounting two gang plows upon a frame in lines which cross each other diagonally within the frame, one gang standing so as to plow in one direction while the other gang is mounted so that it will plow in the opposite direction. These two oppositely acting gangs of plows are provided with mechanism by which one or both of them may be raised from the ground, and the frame is mounted upon a series of adjustable bearing wheels, three of which travel all the time upon solid ground.

SAFETY DEVICE FOR ELEVATORS.—James H. Culver, S. F. No. 220,222. Dated Oct. 7th, 1879. This invention relates to an improved safety device for elevators, and it consists in constructing at the bottom of the elevator well a box provided with flaring slots in its mouth, into which the elevator may fall in case the rope breake or unwinds and the ordinary safety clutches do not act. This box has suitable discharge openings for the air to pass out gradually when the elevator or cage drops into it, and the partially confined air acts as a cushion into which the cage falls, so that its speed is gradually checked and no harm results to the occupants of the cage. Springs are also placed in the bottom of the box, which will also tend to lessen the force of a fall.

MACHINE FOR SEAMING CANS.—R. D. Hume, S. F. No. 220,289. Dated Oct. 7th, 1879. This invention relates to certain improvements in machines for the construction of the containing-cans for hermetically-sealed goods; and it consists in making the crimping-machine adjustable to crimp cans of varying sizes.

Education of Youth.

The Virginia *Enterprise*, speaking of the boys of Virginia City, advances some ideas which with certain qualifications are generally applicable to American boys. It says: "They are a strong race physically and mentally, and they are bright even to precocity. Disciplined and placed in worthy paths and their lives would be real ornaments, but as they are drifting, when manhood turns on its head of steam there will surely be a wrecking of trains. With the greatest mine on earth under our city's streets, no boys can learn mining even if they have lived all their lives here; with the most magnificent mining machinery on earth, at work upon our mines, no boys can learn to be mechanics, and the same rule attaches to all other occupations."

The problem of technical education is involved in this matter, and if it is to be solved at all it will be brought about by the strenuous efforts now being made in this country and in Europe. There is a greater demand for skilled labor then for unskilled, this may be considered the cardinal point of the question, and it is pretty well demonstrated from the fact that skilled labor is very seldom obliged to go a-begging for employment. In nearly every department of mechanics and mining there exists such a division of labor that apprentice work as it used to be known is at a minimum. We may be mistaken, but we certainly have reason to believe, from every-day experience, that purely physical labor remains chained to the dreary routine of "horse work," without very many opportunities to rise above it. The old system of learning to be a machinist by scraping castings, or the shoemaker's art by sawing wood for several years, is very much modified by the quantity of intelligence and skill employed by the new hand. The lad who has received a good technical education need not now fear to be begin at the lowest rung of the ladder, for his merits will not permit him to remain there long.

If the boys of Virginia City were offered the privilege of a technical and experimental school in the mining business, we believe many of them would rise to be an honor to the community. Some unknown and undeveloped genius would be brought out, which is now being smothered through lack of opportunities. Boys live an artificial life in cities because they are crowded out of avenues of progressive development on the ground of inexperience. It will not do to get rid of them by sending them away, for the evils complained of by the *Enterprise* would be perpetuated, not cured. If the boys are not proficient and are inexperienced, how can they be expected to become proficient or experienced unless they are taught? We have no right to complain of the evil future in store for our boys when we have the shaping of that future, and are in a measure responsible for it by failing to afford them the educational advantages which they have the right to expect from us, and with which it is our moral and legal duty to provide them. If the next generation is worse than the present, it is correct to say that the present is responsible for it. If the boys of Virginia City use such infamous language that even "old roughs" turn away with a shudder, they are only following the instructions of "old roughs," who are permitted to demoralize them. The educational problem is easy of solution, if begun properly.

PAUL BOYTON, the swimmer, is coming to California to give exhibitions.

News in Brief.

THREE Afghan Chiefs are imprisoned at Cabul.

FRENCH agriculturists are emigrating to Texas.

THE Marquis of Lorne will visit England about Christmas.

THE Chinese Spanish embassy left New York Thursday for Cuba.

RICHARD CLIFFORD, District Attorney of Trinity county, is dead.

THE Albanians are determined to resist the cession of Epirus to Greece.

STEAMSHIP *Periere* from Havre brought $1,813,000 to New York on 21st.

KING ALFONSO'S marriage will take place on the 27th or 28th of November.

THE recent floods in Spain were terribly destructive of life and property.

A DENSE smoke on the St. Lawrence river has entirely suspended navigation.

IT is reported that the Russians have occupied Merv after several engagements.

INSURRECTIONARY movements are reported in Chihuahua and Durango, Mexico.

IT is rumored in Constantinople that a crisis impends in the Turkish Ministry.

AN amnestied Communist is a candidate for a seat in the Municipal Council at Lyons.

ON railways within 30 minutes of New York drinking water is being sold by the glass.

A DISTURBANCE recently occurred at Lebanon, Syria, in which several persons were killed.

A PACKAGE of papers thrown from the balloon Pathfinder has just been found at Lake, Ind.

SILVER in London, 52¼d: consols, 97 11-16; 5% United States bonds, 105½; 4s, 105⅝; 4½s, 109⅞.

AT Liverpool wheat in quoted at 11@12s for average California white, and 11s 10d@12s 6d for club.

THE severe snowstorm of Friday extended throughout Gallicia, Russia and the Alpine regions.

THE region around Milledgeville, Ga., is under the reign of a gang of murderers and incendiaries.

THE death at Orange, N. J., of Rev. Wm. R. Whiting Hall, Episcopal Bishop of Maryland, is announced.

SNOW fell heavily in Austria October 21st, covering the ground in some places to a depth of several feet.

ALEKO PASHA, Governor of Eastern Roumelia, declines to visit Constantinople on the invitation of the Sultan.

IN the recent flood in Spain 3,500 houses and 120 mills were destroyed, causing a damage of 60,000,000 francs.

THE value of the exports of animals from the United States increased from $389,618 in 1878 to $8,379,200 in 1879.

AN anti-rent meeting was held Sunday at Newport, Mayo county, Ireland, at which 5,000 persons were present.

NOVEL USE OF ETHER.—A prisoner, named Uhlmann, recently barricaded himself in his cell at Vevey, Switzerland, and defied the gendarmes to take him before the judges. It was not thought advisable to shoot him, and the court would not wait till he was starved into surrender, so ether was thrown into the cell until he became sufficiently stupefied to be harmless.

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We have also a complete set of the MONTHLY VOLUMES issued by the Department, with full detailed description and large drawings of all the patents issued since the time when these volumes were first published.

A set of all the LAW BOOKS ON PATENTS is also on our shelves ready for reference. We have also the British Commissioners reports, Canadian Patent Office reports for all British North America, full files of MINING AND SCIENTIFIC PRESS, PACIFIC RURAL PRESS, *Scientific American*, *Scientific American* supplement, *American Artisan* and other American and foreign scientific and mechanical journals, as well as mechanical dictionaries, chemistries, encyclopedias, and other works of reference.

Inventors and patentees are WELCOME TO EXAMINE at their leisure any of the books in the above sets, and we shall be glad to give them any assistance in hunting up what they want.

Our library is the most complete of its kind on the Pacific Coast in every respect, and we are continually adding to it as occasion demands. DEWEY & CO.,

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J. L. THARP—San Francisco.
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A. C. KNOX—Pacific Coast.
S. V. BLAKESLEE.—California.
G. W. MCGREW.—Santa Clara county.
MILTON KENNEDY.—Kern and Inyo counties.
J. B. BACHELDER.—Shasta County, Cal.
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THOS. H. MANNING—Nevada, Idaho and Montana Ter.
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SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

EXTRA COPIES can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

EXPERIMENTAL MACHINERY, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. See ad. F. W. FULLER, 415 Market St., second floor, S. F.

Chew JACKSON'S BEST Sweet Navy Tobacco

LUMBER.

WEDNESDAY M., October 22, 1879.

CARGO PRICES OF PUGET SOUND PINE

REDWOOD.		RETAIL PRICE.	
Rough, M	13 00	Rough, M	18 00
Refuse	9 00	Fencing	18 00
Clear	23 00	Flooring and Step	28 00
Clear Refuse	13 00	Narrow	30 00
Rustic	23 50	2d quality	25 00
Refuse	18 00	Laths	3 50
Surfaced	20 00	Furring, lineal ft	
Refuse	14 00	**REDWOOD.** RETAIL PRICE.	
Flooring	20 00	Rough, M	18 00
Refuse	12 00	Refuse	14 00
Beaded Flooring	23 00	Pickets, Rough	15 00
Refuse	13 00	Pointed	18 00
Half-inch Siding	15 00	Fancy	22 50
Refuse	14 00	Siding	20 50
Half-inch Surfaced	20 00	Surfaced & Long Beaded	30 00
Refuse	14 00	Flooring	30 00
Half-inch Battens	16 00	Refuse	22 50
Pickets, Rough	11 00	Half-inch Surfaced	30 00
Rough, Pointed	12 50	Rustic, No. 1	30 00
Fancy, Pointed	18 00	Battens, lineal ft	
Shingles	1 75	Shingles M	2 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & CO.]

SAN FRANCISCO, October 22, 8 P. M.

SILVER, 25.

GOLD BARS, 890@910. SILVER BARS, 10@18 ⅌ cent. discount.

EXCHANGE on New York, 20, on London bankers, 4⅞@4⅞. Commercial, 50; Paris, five francs ⅌ dollar; Mexican dollars, 92.

LONDON Consols, 97 13-16; Bonds (4%), 105⅞.

QUICKSILVER in S. F., by the flask, ⅌ lb, 33½c.

GENERAL MERCHANDISE.

[WHOLESALE.]

WEDNESDAY M., October 22, 1879.

CANDLES.	
Crystal Wax	17 @—
Eagle	12 @—
Patent Sperm	30@—
CANNED GOODS.	
Assorted Pie Fruits.	
2½ lb cans	2 25 @ —
Table do	3 50 @ —
Jams and Jellies	3 75 @ —
Pickles, hf gal	3 25 @ —
Sardines, qr box	1 67½@1 90
Hf Boxes	2 50 @2 75
Merry, Faull & Co.'s.	
Preserved Beef.	
2 lb. doz	3 75 @4 00
do Beef, 4 lb, doz	5 50 @ —
Preserved Mutton.	
2 lb. doz	3 75 @ —
Beef Tongue	6 50 @ —
Preserved Ham.	
2 lb, doz	5 50 @ —
Deviled Ham, 1 lb, doz	5 50 @ —
do Ham, ½ lb doz	3 00 @ —
Boneless Pigs Feet,	
3 lbs	4 50 @ —
2 lbs	3 75 @ —
Spiced Fillets.	
2 lbs	4 25 @ —
Head Cheese.	
3 lbs	4 25 @ —
COAL—Jobbing.	
Australian, ton	5 00 @ 8 50
Coos Bay	— @ 5 50
Bellingham Bay	— @ —
Seattle	5 50 @ 6 00
Cumberland	12 00 @15 00
Mt Diablo	4 75 @ 8 00
Lehigh	11 50 @12 50
Liverpool	5 00 @ 6 50
West Hartley	— @ 8 00
Scotch	— @ 8 00
Scranton	— @ —
Vancouver Id	6 00 @— —
Charcoal, sack	75 @— —
Coke, hush	60 @— —
COFFEE.	
Sandwich Id, lb	— @— —
Costa Rica	18 @ 16½
Guatemala	18 @ 16½
Java	25 @— 26
Manilla	17 @— —
Ground, in cs	25 @— —
FISH.	
Sac'to Dry Cod	— @ 4
do in cases	5 @ 5
Eastern Cod	— 7 @— 7½
Salmon, bbls	8 00 @ 9 00
Hf bbls	5 00 @ 5 50
1 lb cans	1 10 @ 1 12½
Pkld Cod, bbls	22 00 @— —
Hf bbls	11 00 @— —
Mackerel, No. 1.	
Hf Bbls	9 50 @10 00
In Kits	1 85 @ 2 10
Ex Mess	3 25 @— —
Pkld Herring, bx	3 00 @ 3 50
Boston Smkd H'g	70 @— —
LIME, Etc.	
Plaster, Golden Gate Mills	3 00 @ 3 25
Land Plaster, tn	10 00 @12 50
Lime, Sta Cruz, bbl	1 25 @ 1 50
Cement, Rosendale	2 00 @ 2 25
Portland	4 00 @ 4 50
NAILS.	
Assted sizes, keg	2 70 @ 2 75
OILS.	
Pacific Glue Co's	
Neatsfoot, No 1	1 00 @ 90
Castor, No 1	1 35 @ —
do, No. 2	1 30 @ —
Baker's A A	1 25 @1 30
Olive, Plagniol	5 25 @5 75
Possel	4 75 @5 25
Palm, lb	9 @ —
Linseed, Raw, bbl.	78 @ —
Boiled	80 @ —
Cocoanut	55 @ —
China nut, gs	— @ 65
Sperm	1 40 @ —
Coast Whales	— @ 32½
Polar	— @ 35
Lard	— @ 70
Oleophine	22 @ 22
Devoe's Brll't	17½@ 18½
Photolite	— @ —
Nonpariel	31 @ 32½
Eureka	18 @ 42½
Barrel kerosene	20 @ —
Downer Ker	35 @ —
Elaine	37½@ —
PAINTS.	
Pure White Lead.	8 @ 8½
Whiting	1½@ —
Putty	4 @ 5
Chalk	1½@ —
Paris White	2½@ —
Ochre	3½@ —
Venetian Red	3½@ —
Averill Mixed Paint, gal.	
White & tints	2 00 @2 40
Green, Blue & Ch Yellow	3 00 @3 50
Light Red	3 00 @3 50
Metallic Roof	1 30 @1 50
RICE.	
China, Mixed, lb	4½@ 5
Hawaiian	5 @ —
SALT.	
Cal. Bay, ton	15 00 @22 50
Common	10 00 @12 00
Carmen Id	12 00 @14 00
Liverpool fine	19 00 @— —
SOAP.	
Castile, lb	8 @ 15
Common brands	4½@ 5
Fancy brands	7 @ 8
SPICES.	
Cloves, lb	— @ 45
Cassia	19 @ 20
Nutmegs	85 @ 5½
Pepper Grain	— @ 12
Pimento	19 @ 20
Mustard, Cal., ½ lb glass	— @1 25
SUGAR, ETC.	
Cal. Cube, lb	— @ 10½
Powdered	— @ 10½
Fine crushed	— @ 10½
Granulated	— @ 10
Golden C	— @ 8½
Cal. Syrup, kgs	70 @ —
Hawaiian Molasses	26 @ 30
TEA.	
Young Hyson, Moyune, etc	— @ 51
Country pckd Gunpowder & Imperial	— @ 42½
Hyson	30 @ 35
Fooo-Chow O	35 @ —
Japan, 1st quality	40 @ —
2d quality	20 @ 2

METALS.

[WHOLESALE.

WEDNESDAY M., October 22, 1879.

IRON.—	
American Pig, soft, ton	28 00 @35 00
Scotch Pig, ton	26 00 @29 00
American White Pig, ton	25 00 @— —
Oregon Pig, ton	28 00 @35 00
Refined Bar	4 @ 8
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 8
Norway, according to thickness	7 @ 8
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	15 @ 17
Black Diamond, ordinary sizes	15 @— —
Drill	16 @ 17
Flat Bar	15 @ 19
Plow Steel	8 @ —
TIN PLATES.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft, 7 to 10, lb, less than cask	9½@— 10
NAILS.—	
Assorted sizes	3 50@4 50

LEATHER.

[WHOLESALE.]

WEDNESDAY, M., October 22, 1879.

Sole Leather, heavy, lb	22 @ 23
Light	20 @ 24
Jodot, S Kil., doz	48 00 @50 34
11 to 13 Kil	45 00 @57 00
14 to 19 Kil	61 00 @73 00
Second Choice, 11 to 15 Kil	55 00 @70 00
Cornellian, 12 to 15 Kil	57 00 @67 00
Females, 12 to 13 Kil	63 00 @67 00
14 to 15 Kil	71 00 @76 00
Simon Ullmo, Females, 12 to 13 Kil	58 00 @62 50
14 to 15 Kil	66 00 @70 00
15 to 17 Kil	72 00 @74 00
Simon, 18 Kil	51 00 @63 00
20 Kil	65 00 @67 00
24 Kil	72 00 @74 00
Robert Calf, 7 and 9 Kil	35 00 @40 00
Kips, French, lb	1 00 @ 1 35
Cal. doz	40 00 @60 00
French Sheep, all colors	8 00 @15 00
Eastern Calf for Backs, lb	1 00 @ 1 25
Sheep Roans for Topping, all colors, doz	9 00 @13 00
For Linings	5 50 @10 50
al. Russet Sheep Linings	1 75 @ 4 50
oot Legs, French Calf, pair	4 00 @— —
BGood French Calf	4 00 @ 4 75
Best Jodot Calf	5 00 @ 5 25
Leather, Harness, lb	35 @ 37½
Fair Bridle, doz	48 10 @72 00
Skirting, lb	33 @ 37
Welt, doz	30 00 @50 00
Buff, ft	15 @ 17
Wax Side	15 @ 17

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending October 21, 1879.

HIGHEST AND LOWEST BAROMETER.

Oct. 15	Oct. 16	Oct. 17	Oct. 18	Oct. 19	Oct. 20	Oct. 21
30.199	30.257	30.282	30.240	30.235	30.173	30.034
30.120	30.188	30.181	30.100	30.175	30.050	29.927

MAXIMUM AND MINIMUM THERMOMETER.

80	65	73	77	78	76	77
54	54	55	58	58	57	57

MEAN DAILY HUMIDITY.

82.7	89.3	52	51	55	63.3	58.7

PREVAILING WIND.

W	W	N	NW	NW	NW	N

WIND—MILES TRAVELED.

238	181	130	103	112	98	59

STATE OF WEATHER.

Fair.	Fair.	Clear.	Clear.	Clear.	Clear.	Clear.

RAINFALL IN TWENTY-FOUR HOURS.

Total rain during the season, from July 1, 1879, 0.81 in.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Alpha Hydraulic Gravel Mining Company.

Principal place of business, San Francisco, California. Location of works, Alpha Hill, Nevada Co., California.

Notice is hereby given that at a meeting of the Board of Directors held on the 2nd day of October, 1879, an assessment (No 1) of Twenty Cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold and silver coin, to the Secretary, at the office of said Company.

Any stock upon which this assessment shall remain unpaid on the Tenth day of November, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the Thirteenth day of December, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. JAMES IRELAND, Secy.

Office, No. 216 Sansome street, San Francisco, California

Numa Mining Company.—Principal Place

of business, San Francisco, California. Location of works, Humboldt County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 23rd day of October, 1879, an assessment (No. 2) of Two Cents (2) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 328 Montgomery St., room 21, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 24th day of November, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 15th day of December, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

DAVID WILDER, Secretary.

Office, 328 Montgomery St., Room 21, San Francisco, Cal.

Orion Mining Company.—Location of

principal place of business, San Francisco, California. Location of works, Iowa Hill, Placer County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 8th day of October, 1879, an assessment (No. 5) of Thirty (30) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 28 Sansome street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 10th day of November, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on Tuesday, the 25th day of November, 1879, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors. P CONKLIN, Secretary.

Office, No. 28 Sansome St. (up-stairs) San Francisco, Cal.

The Pacific Land and Trust Company.—

Location of principal place of business, 513 California street, San Francisco, Cal.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 1) levied on the Eighteenth day of September, 1879, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Am't.
Benj. Flint	1	100	$125 00
D W F B'ske	3	100	125 00
E W Steele	4	100	125 00
John Le Baron	5	100	125 00
R P Langton	7	100	125 00
Benj. Flint	18	520	650 00
E P Billings	18	40	50 00
R P Langton	20	1800	2000 0

And in accordance with law and an order of the Board of Directors made on the 18th day of September, 1879, so many shares of each parcel of said stock as may be necessary will be sold at public auction at the office of the Pacific Land and Trust Company, 513 California street, on the 15th day of November, 1879, at the hour of two o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale. WM. ANDREWS, JR., Secretary.

Office, 513 California street, San Francisco, Cal.

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☞ Rooms for $10, $15 and $20 per month.

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Iron and Machine Works.

THOS. PENDEROAST. HENRY S. SMITH.

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MANUFACTURERS OF

IRON CASTINGS and MACHINERY

OF ALL KINDS.

Fremont Street, Bet. Howard and Folsom,

SAN FRANCISCO.

UNION IRON WORKS,

SACRAMENTO, CAL.

ROOT, NEILSON & CO.,

MANUFACTURERS OF

STEAM ENGINES, BOILERS AND ALL Kinds of Machinery for Mining Purposes.

Flouring Mills', Saw Mills' and Quartz Mills' Machinery constructed, fitted up and repaired.

Front Street, Between N and O Streets,

SACRAMENTO, CAL.

PHELPS MANUFACTURING COMPANY,

Manufacturers of all kinds of

Wharf and Bridge Bolts, Railroad Trestle Work, Car Frames and Bolts, Machine Bolts, Set Screws and Tap Bolts, Lag or Coach Screws.

ALL STYLES OF FANCY HEAD BOLTS.

HOT AND COLD PRESSED HEXAGONAL AND SQUARE NUTS, WASHERS, BOLT ENDS, TURNBUCKLES, ETC., ETC.

13, 15 and 17 Drumm St., near California,

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Golden State & Miners Iron Works,

Manufacture Iron Castings and Machinery of all Kinds at Greatly Reduced Rates.

STEVENSON'S PATENT

Mold-Board AMALGAMATORS,

Golden State Pressure Blowers.

First St., between Howard & Folsom, S. F.

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WM. DEACON, PROPRIETOR.

Nos. 131, 133 & 135 Main St., San Francisco.

Stationary and Marine Engines,

Shafting, Pulleys, and General Machine Work. Jobbing and repairing done Promptly and at Lowest Rates. Screw Propellers, Propellor and Steamboat Engines.

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SAN FRANCISCO, CAL.

All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, Sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch. PRICES MODERATE.

J. H. WEEO. V. KINOWELL.

WM. H. BIRCH. JOHN ARGALL.

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THOMPSON BROTHERS, EUREKA FOUNDRY,

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VERTICAL ENGINES,	BABY HOISTS,	STAMPS,
HORIZONTAL ENGINES,	VENTILATING FANS,	PANS,
AUTOMATIC CUT-OFF ENGINES,	ROCK BREAKERS,	SETTLERS,
COMPOUND CONDENSING ENGINES,	SELF-FEEDERS,	RETORTS,
SHAFTING,	PULLEYS,	ETC., ETC.

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Batteries for Dry or Wet Crushing, Amalgamating Pans, Settlers, Furnaces, Retorts, Concentrators, Ore Feeders, Rock Breakers, Furnaces for Reducing Ores Water Jackets, Etc.

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Crushing Rolls, Clarifiers, Vacuum Pans, Air Pumps, Concentrators, Bag Filters, Charcoal Filters, Blow-up Tanks, Coolers and Receiving Tanks.

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Flour Mill Machinery, Saw Mill Engines and Boilers, Dredging Machinery, Oil Well Retorts, Powder Mill Machinery, Water Wheels.

Engines and Boilers of all kinds, either for use on Steamboats and made in accordance with the Act of Congress regulating the same, or for use on land. Water Pipe, Pump or Air Column, Fish Tanks for Salmon Canneries of every description.

Boiler repairs promptly attended to and at very moderate rates.

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HIGH PRESSURE OR COMPOUND.

STEAM VESSELS, of all kinds, built complete with Hulls of Wood, Iron or Composite.

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STEAM LAUNCHES, Barges and Steam Tugs constructed with reference to the Trade in which they are to be employed. Speed, tonnage and draft of water guaranteed.

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Several first premiums received for Quartz Mill Screens, and Perforated Sheet Metals of every description. I would call special attention to my SLOT CUT and SLOT PUNCHED SCREENS, which are attracting much attention and giving universal satisfaction. This is the only establishment on the coast devoted exclusively to the manufacture of Screens. Mill owners using Battery Screens extensively can contract for large supplies at favorable rates. Orders solicited and promptly attended to.

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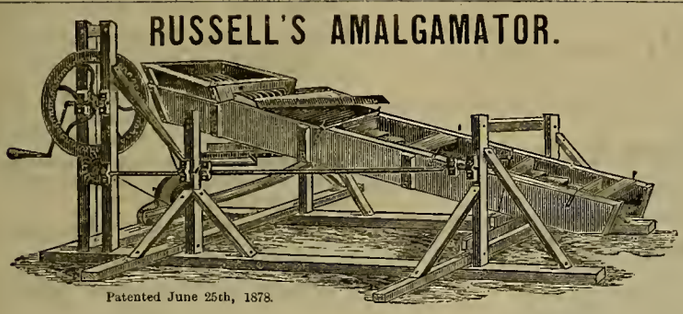

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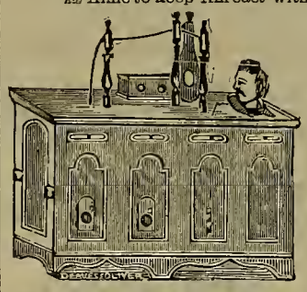

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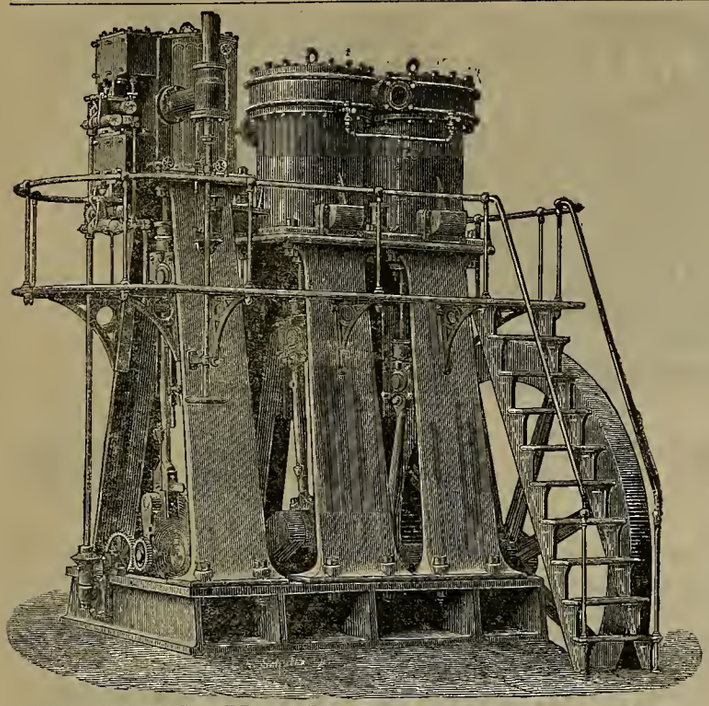

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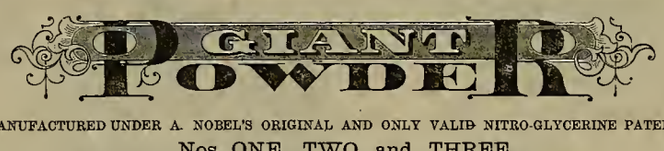

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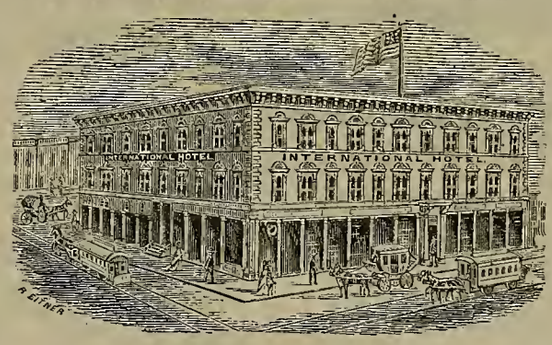

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SAN FRANCISCO, SATURDAY, NOVEMBER 1, 1879.

VOLUME XXXIX Number 18.

Prof. Church on the Comstock Lode.

Two years ago the United States Government determined to resume the task of surveying the Comstock mines, which it had carried up to the year 1870 and then abandoned. The first intelligent study of these important sources of bullion was made by the celebrated Austrian geologist, Von Richthofen, about the year 1864. Mr. Clarence King followed him in 1869, and eight years later Prof. John A. Church was employed to take up the long neglected work. He spent five months in constant examination of the mines, and the results of his work are now published by Messrs. John Wiley & Sons, of New York. He was attached to that department of the Government service which is known as the Surveys west of the 100th meridian, the scope of which has now been reduced, the scientific work being taken from it and placed, with that of all other Government surveys, in the hands of a special scientific commission, under the charge of Mr. King. The Government, therefore, will not issue any further report from Prof. Church, the present volume,* published by a business firm, being an enlargement of the report written for the Government.

Before entering upon a discussion of the book, it may be well to remark that Prof. Church's appointment was the first break in a long series of years, during which the interests of the mines were wholly neglected, though almost everything that had no relation to the welfare of the Western country was carefully hunted up and described. The first step in the new direction was made by the Chief of the Surveys west of the 100th meridian, and the first result of the new departure is Prof. Church's book. The number of new facts which he has collected and new explanations which he has found, is an evidence of the room there is in this important field.

Another proof is the remarkable interest which has been shown at home and in Europe in the preliminary report made by him a year ago. That undertook to explain the cause of the heat in the Comstock mines by the new theory of kaolinization. It has been repeatedly translated and published in Europe, and has formed the subject of comment by authorities in mineral studies.

The present volume is quite as original. It undertakes to give the history of the Comstock lode, as it is shown in the structure and position of the quartz bodies and the country rock.

Probably no other assertion made in the book will be considered so startling and, perhaps, combatted so much, as the assertion that the lode is *not* a true fissure vein. That is to say, Prof. Church says that there was not a great crevice into which the ore penetrated, and in proof of this he points to the absence of an east wall, the enormous thickness of some quartz bodies—200 feet in the Con. Virginia and 300 feet in the Jacket—and the fact that there is no such thing as vein matter outside of the quartz bodies. Above and below them we find nothing but country rock, and no sign of a vein. He considers it impossible for a crevice to open wide enough to take in a body 300 feet thick and yet show no evidence of its continuation, above it or below it.

We are inclined to the belief that the theory which the author offers to take the place of the fissure-vein origin of the Comstock, is one that promises just as great permanence in depth as if there were a fissure. He attributes the ore to waters which ascended from a great depth, which, he thinks, may be as much as 12,000 feet—at all events, much beyond the possibilities of mining. Before giving Prof. Church's theory, we will recount some of the facts upon which he based it.

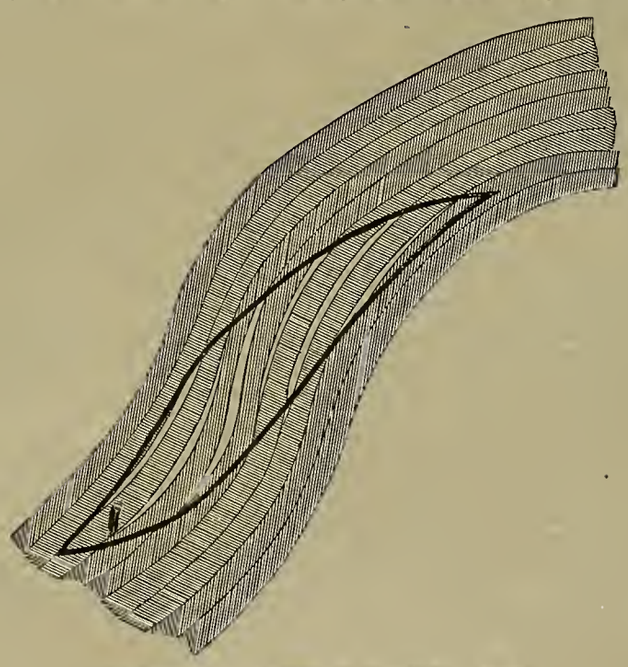
First, as to the position of the quartz bodies. It has always been noticed by miners that there was some connection between the position of ore and the ravines of the surface; but geologists are not ready to acknowledge that the form of the surface, which is a carving made by rain and frost, can have anything to do with the deposition of ore in the crust away from these agencies. But Prof. Church finds that the observation of the miners is true, and that the position of the quartz and the sculpture of the surface are governed by a cause that preceded them both.

The black dyke forms the west wall of the lode, and this wall shows a series of undulations, which would make low hills and shallow valleys if it were laid on its broad side. The quartz invariably forms on the shoulder of these hills. Sometimes it reaches clear over the crest, and frequently it covers a large part of the folds; but the author considers that the shoulder of the ridge was the principal point of deposition.

He finds that all quartz bodies, whether they carry ore or not, are curved at one end. They have the shape of a boomerang, the handle representing the long, thin mass of quartz that lies on the top of the undulations, the swell toward the head representing the thickened part of the quartz just at the shoulder of the fold, the strong curve comes then, following the west wall and carrying the quartz into one of the valleys. Sometimes the curve is at the north end, sometimes at the south end, and in the Justice the ore channel, near the suface, ran N. E.-S. W. From this diversity the author concludes that magnetic causes had nothing to do with the formation of the quartz.

It is well known that the rocks of the Comstock country are diorite, propylite, andesite and trachyte, which appeared in the order given. Prof. Church says that the andesite did not come on the ground until the diorite and propylite had been deposited in broad sheets of rock, folded and then raised up to about their present inclination. The folds now form those hills and valleys in the west wall which we have just spoken of. The rocks were thoroughly cool when the andesite penetrated them, and as that came up in a melted condition, it baked the rocks for a few feet on each side. This is a common thing at eruptive dykes, which are very often bounded on each side by a mass of rock which has been shattered and fissured by their heat, and often several feet thick. Water can penetrate such a seam with great ease. The black dyke has just such a shattered seam of porphyry next it, and Prof. Church says that this was the channel by which the metal-bearing waters entered the rocks. We believe that in making this observation he is the first scientific man who has attempted to point out the actual channel by which ores have been brought into the positions where they are found. Hitherto, cracks, crevices and fissures have been vaguely spoken of as probably existing even where they could not be found. Indeed, the whole theory of true fissure veins rests partly upon the assumption that a fissure is necessary as a channel to account for the presence of the ore. One advantage of this explanation is that it gives a reason for the frequent occurrence of metallic ores near eruptive dykes, though they are not found or are comparatively rare in the neighborhood of the innumerable faults which are discovered in many localities. Great numbers of such faults are known, but when they are not accompanied by eruptive dykes they do not show the intimate relation with metalliferous deposition which is recognized as a peculiarity of igneous rocks.

Entering the rocks by this sheath of broken material next the dyke, the waters would deposit their load of quartz in any crevices adjoining; and now we reach the significant fact that the principal deposition was on the shoulder of the folds or ridges. This indicates crevices there, and to account for their presence Prof. Church offers an elaborate explanation. He says that the rocks of the Comstock are stratified even when their origin is eruptive, and that in folding the different layers formed concentric arches, just as they do in all stratified rocks. After they were folded a new eruption occurred, and an immense mass of andesite was poured out on the surface. The weight of this new rock flattened the folds and squeezed out the layers of which they were composed. Any one of these is of greater length in the crest of a fold than the one under it, and when pressed out it would arch itself slightly over its neighbor just at the edge of the crest, where there would be some relief from the weight of the andesite. This arching might be very small indeed, and form no more than the merest parting of the strata, but such partings are quite enough to admit the waters.



SUBSTITUTED MASSES IN MINERAL VEINS

The reason why the ore is on the edge of the valleys is now apparent, and the explanation also accounts for the similar valleys on the surface. These surface depressions are not the product of erosion merely. They mark the site of troughs which were produced by the original folding, and to these troughs the old surface waters naturally took their way, widening and deepening them. In this way we see that the position of the ore in the depths of the crust and the form of the surface may have an intimate connection, in some kinds of mineral deposits, because the position of the two is determined by a common cause. This explanation is quite as novel as that relating to the ore channel, for so long as the existence of great fractures was felt to be necessary to the formation of ore bodies like those of the Comstock, it was impossible to imagine how there could be any relation whatever between the form of these cracks produced by rending of forces of great power, and the form of the surface which is mostly the product of atmospheric action.

This is one of the evidences that the Comstock is not a true fissure vein, for the fact of a connection of some kind between the interior deposits and the exterior sculpture has long been acknowledged by those who are familiar with the development of the lode. In the place of fracture, Prof. Church puts the ordinary dynamical forces, which have molded the rocks in every part of the earth.

But this explanation supposes that the crevices opened between the strata were very small, and Prof. Church says they may have been too narrow to admit the hand. How then have the vast ore bodies been formed? This is accounted for by the process of *substitution*. When water is filtered through powdered feldspar the rock is decomposed and clay is formed. Heat and pressure greatly increase the action, and the author holds that when the crevices between the strata were filled with hot siliceous water, the rock layers were eaten away and taken into solution, or carried off in a very fine condition and discharged at the surface. Quartz was substituted for the solid rock, and as each layer would be attacked on both sides, the several seams of quartz would finally unite and produce a great body.

The mines give proof that this was the origin of the quartz. Every one knows of the horses that the lode contains, and Prof. Church says that these horses are the remains of porphyry layers that have been only partly removed. In the center of the quartz, whether barren or not, the deposit may be almost or entirely composed of silica, but toward its edges it is *invariably* broken up into alternate layers of silica and porphyry. That is because the edges of the deposits were not reached by the waters as early as the center, and the horses represent a part of the lode that was under the action of the water for only a portion of the time. Though this explanation is new, the market long ago discovered that a horse in a Comstock ore body meant the approaching termination of ore. The edges of the quartz bodies interleave with the porphyry layers, and the appearance of these layers indicates that the boundaries of the deposit are near. Prof. Church says, that the existing definitions of vein structure do not satisfy the conditions of the Comstock. What those definitions are, can be seen from the PRESS of October 4, 1879, where they are given by Mr. Phillips. To the various kinds of veins there described, our author proposes to add *Substituted Masses*, which, he says, have the deep origin of true fissure veins, and yet are not formed in a great crevice.

This mode of formation is illustrated in the following figure copied from the book. It shows how the layers of porphyry may be pressed open by a weight laid on them, and how the union of the little crevices between them by the removal of the rock would form just such a lens of quartz as we find in the Comstock.

But all that we have so far discussed is of small importance compared to the discovery of the true vertical position of the ore bodies. The position on the strike is on the shoulders of the curves in the west wall, as already stated, and on the dip the ore is invariably found, says Prof. Church, in the steeper parts of the lode. The flat portions never contain it. But to ascertain what are flat portions the dips compared must be taken from the same locality, for all dips in Gold Hill are less, on the average, than those in the Virginia portion of the lode. Our readers are familiar with the theory so commonly accepted that the ore bodies of the Comstock stand vertically in the lode, or rise from the footwall to the hanging. Prof. Church says that this is not true. They follow the footwall closely, but lie only in the steep parts of

[CONTINUED ON PAGE 281.]

*The Comstock Lode, Its History and Formation. By John A. Church. Illustrated by six colored geological plates and thirteen engravings. New York: John Wiley & Sons. San Francisco: THE MINING AND SCIENTIFIC PRESS.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Suggestions for the Land Commission.

EDITORS PRESS:—I enclose a copy of a communication addressed to the Public Land Commission, Washington D. C., which you can publish if you think it worthy of space in your journal.—GEO. W. JONES, Exchequer Mill, Silver Mountain, Alpine Co., Cal., Oct. 20th, 1879.

To the Public Land Commissioner:—Having devoted the greater part of the past 20 years to prospecting, mining and working various kinds of ores in Colorado, Utah, California, Canada, New Hampshire and the Lake Superior iron and copper regions, I feel competent to answer some of your inquiries appearing in the MINING AND SCIENTIFIC PRESS of the 27th ult.

The first question is answered in the above.

2d. The width allowed by the present law is not sufficient to cover the width of all lodes, in all cases, in all sections of the country. As far as my experience extends to Colorado, outside of Leadville district, the lodes range from three to ten feet in width. My experience there, however, was at an early day; wider formations may have since been discovered. I discovered several veins in Utah that were over 60 feet in width. I opened what is now known as the Jordan in 1870, and exposed a body of ore 60 feet in width. I was defrauded of the property by the workings of the old law regulating mining locations. The old Telegraph mine is a continuation of the same lode to the east. In this county, in Monitor and Silver Mountain districts, it is quite different. Here I find eight formations. Each formation consists of a group of veins or fissures, all having the same course and dip, showing the same outcroppings and producing the same combination of minerals (when developed, as far as explored) peculiar to themselves.

The first and oldest formation produces gold and magnetic iron, the latter (when pulverized and washed) in the form of black sand, running north 14°, dip 32′ west. They are on a large scale, ranging from 300 to 2,000 feet in width, the gangue near the surface being pure quartz, stained with oxide of iron.

The second formation consists of a group of ledges ranging from 120 to 150 feet in width, running due north and south, with a dip of 14° west of the vertical line. This formation produces gold and silver of about equal value, copper and lead (in very small quantities), zinc and iron pyrites. The gangue is decomposed white quartz, almost a clay. The "float" from this formation is a peculiar white, honey-comb quartz. The ore is well distributed through the vein, but is richer near the east, or "footwall" side of the ledge.

The third and fourth formations have not as yet, at any point, been sufficiently developed to warrant my expressing an opinion as to their value. They both run north of west and south of east. The former dips to the southwest and the latter to the northeast.

The fifth formation is composed of a group of ledges running magnetic north and south, dipping to the east (magnetic variation here 16° east). They are thoroughly impregnated with iron, but as far as developed, do not yield the precious metals in paying quantities. I would here state that the magnetic needle is not reliable while passing over a ledge of this group.

Ledges of the sixth formation run west 16° north and dip to the north, and produce sulphurets of copper, with frequent specimens of black oxide, except at the point of contact with an older mineralized vein. It then contains the combination of metals belonging to the ledge it is crossing, although it preserves its own stratification and gangue. I attribute this to the precipitating power possessed by the metal belonging to that particular group. The latter veins are 120 feet in width.

The seventh formation bears north 50° east and dips 8° northwest.

The eighth formation bears north 32° east and dips from 10° to 30° southeast.

The last two formations have not had sufficient age to become mineralized. They show prominent outcroppings, as the action of the elements has not had time to decompose and obliterate them. Their width ranges from 10 to 600 feet. As they are quite numerous, they destroy a large portion of the older mineral-bearing ledges, and serve to deceive and mystify the miner by cutting off ore deposits and leading him away from the valuable ledges. I find similar combination of ledges in Colorado and Utah, but as the formations are comparatively narrow, the mineralized ledges are not cut up and displaced to the same extent they are in this section of the country.

In Bingham canyon, Utah, I found several naturally worthless ledges being worked profitably, owing to the fact that the fissure worked cut a group of mineral-bearing ledges, enriching the otherwise worthless ledge, producing ore deposits in the form of "chimneys," or "chutes." Prospecting beyond the line of contact with the mineralized veins, the walls and stratification remained perfect, but destitute of mineral.

4th. The courses of all fissures, as well as their width, dip and their comparative age can be readily determined without any outlay of capital in developing, if proper means are employed to that end.

5th and 6th. Answered in the above.

9th. As previously stated, I have found ledges in this section of the country the width allowed under the present law not being sufficient to cover the full width of the ledge.

10th. I have thus far found that each group of ledges carry their regular course, varying but three or four degrees, allowing for elevations and depressions of surface and the dip of the ledge. If they appear to otherwise curve or present an angle, it is owing to the presence of a later formation which may run nearly the same course; the dip will also probably change, although it may be but slight, and the character of the gangue and combination of minerals will also change.

Having other facts to communicate and fearing my statement may be too lengthy, I will not undertake to answer the balance of your questions at the present time. I will state that I find each and every fissure possessing an electric current of its own, independent of all others. I have been investigating its bearings upon mineral deposits for the past 20 years, and I have given you the results of some of my discoveries. If the laws established by nature were perfectly understood (and it is only a matter of time, as they are as plain and can be as readily comprehended by those who will devote the necessary time and study, as the movements of the planets), there would be no occasion for the numerous litigations that are now hampering this industry, and the money now being expended in developing worthless veins would be employed in working the old mineralized ledges and produce remunerative results.

The "Comstock" was a source of wealth to the country while it was worked in its true dip to the west. When, reaching a later formation dipping to the east, the identity of the old ledge was lost and destroyed, and the later formed ledge was followed in its dip until reaching the crossing of another old and mineralized vein at such an angle as to produce a deposit of ore as found in the lower workings of the California and Con. Virginia claims. When the workings pass below the point of contact, the ledge resumes its naturally barren condition, until, at still greater depth, it may cut another vein of the mineralized group.

The fact that a drift has been run or a diamond drill been sent into the "west country" does not demonstrate the incorrectness of my statements, as I find here fully four-fifths of the ground covered by the first formations, also occupied by later formations, and but few of the latter retaining the wealth of the former at the point of contact. The older formations show no outcropping, but create depressions, as both chemical and magnetic forces decompose the ledge matter, rendering it more sensitive to the action of the elements.

I could give additional facts and information gathered from the numerous fields I have visited, but knowing the strong prejudice existing against the idea that any knowledge can be obtained beyond the point of the pick and drill, I shall await the result of my first communication in order to know if your Commission is disposed to make use of these discoveries to assist in preventing the present waste of time, labor and treasure, under the present system, or rather want of system in mining.

At the present time mining companies, as a rule, are legalized lotteries, where the manipulators take the prizes and the general public the blanks; the wealth of the West being absorbed into the overflowing coffers of the few.

For various reasons, I attribute mineral deposits to the magnetic currents which, I have previously stated, I find to exist. 1st, I find metals that are the least sensitive to magnetic influence are found in paying quantities only in the line of the older formations. 2d, I find samples of ore from the second formation showing native gold, native silver, black sulphurete of silver, silver glance, zinc-blende, and iron and copper pyrites all separate and detached, each from the other in the same sample. If the deposit was formed by heat in a melted condition or by infiltration, the deposit would have been found in the form of an alloy. The iron and copper ranges of Lake Superior region are but a few miles apart. If the deposits were formed by any of the means now advocated by scientists, some of the Portage lake copper would have found its way into the iron range of Marquette, from the latter point to L'Anse bay. Again, here I find the fifth formation producing iron only, and the sixth copper; these veins thoroughly impregnated with the metals belonging to them, in close proximity to older veins carrying the "noble" metals.

The Jordan and Old Telegraph mines of Utah (the sixth formation) have yielded and yield immense masses of lead ore, but contain only from 11 to 25 ounces silver and a trace of gold per ton, except at points of contact with older formations, where bunches of ore assaying up into the hundreds of ounces are obtained. Again, in the old workings of the Winnemuck (also of Bingham canyon) a vein of the fourth formation yielded average assays of 60% lead and 60 ounces silver per ton. At the crossing of two older formations, masses of ore were encountered assaying 500 ounces per ton. A slip of 80 feet occurs in the lower workings, causing a displacement of the vein. I could cite other instances to prove the correctness of my theory.

From my own observations I should judge that fissures start from a great depth, probably many miles (perhaps thousands) from the point of outcrop, breaking through the earth's crust at points of least resistance, where fractures have been caused by earlier upheavals, forming vast mineral belts, consisting of groups of ledges, each group possessing different combinations or variety of metals. As the starting point of each group (as they all have different dips) may be many miles away from other groups, each group cutting different metallic deposits, the electric currents impregnate the fissures with the variety or varieties of metals encountered along their course.

I am now in the employ of the Isabelle Gold and Silver mining company (limited), of London, Louis Chalmers, Esq., Manager. This company is engaged in running a long tunnel to strike a group of ledges at a great depth. Several months ago I made a survey of the various formations and stratifications they would encounter, giving their cleavage and fractures. They are now in something over 1,000 feet, and the workings thus far demonstrate the correctness of my survey. I would state, there is nothing in the appearance of the formation at the surface where exposed to indicate the various changes they have already and will in future encounter. Yours respectfully,

GEO. W. JONES.

The Como Mining District, Nevada.

EDITORS PRESS:—If Virginia City can boast of its Mount Davidson, and of that wonderful ore channel, the Comstock lode, trending down beneath its giant shadows, so we are able to boast at Como of our Mount Lincoln, which is 540 feet higher than Mount Davidson, and our Como lode. We have here with a reasonable degree, the certainty of the permanency and reliability of metal-bearing lodes, the topographical, geological and lithological structure of the country in this vicinity being the same as on the Comstock lode. In a country like Nevada, where the surface is everywhere distorted and corrugated by tremendous eruptive forces, vast sums of money might be saved, and innumerable disastrous failures might be avoided by simply noting the trend and position of the volcanic dykes and of the eruptive ridges, which were unquestionably the direct cause of the faultings, defections and other perplexing disturbances so frequently encountered in the quartz veins of the great basins of this State. If a mining engineer can ascertain with reasonable certainty the source of a local disturbance or fault in the quartz vein, he may frequently succeed in regaining an apparently lost lode, and save from abandonment an extremely valuable property. The Como lode, which was in the market from 1860 to 1863, has been abandoned since 1863, until last summer people started sinking shafts, which have achieved brilliant results.

The Eureka shaft at a depth of 75 feet has ores which on an average assay $52. The Chieftain shaft at a depth of 200 feet has ores assaying $62. The West-Rapidan shaft at a depth of 175 feet has ores assaying $336. The Yellow Jacket, Mayday, Sierra Nevada, Buckeye, Ohio, Sunrise, Como, Consolidated Como, Star of the West and the Cresus mines are of equal richness.

The Como lode rests upon an elevated plateau 800 feet higher than Virginia City, at a point about 20 miles southeast from Virginia City. The road is a good one, having from Dayton an easy regular grade, all the way to the summit; but the dismal black walls of basalt, and the fantastic pyramids of scoria and other volcanic vestiges which flank the way on either side, are neither picturesque nor encouraging. Upon emerging from this plutonic chasm, into the bright sunlight and pure air of the elevated mesa, the scene is one of enchanting grandeur. Away to the northwest Mt. Davidson lifts its isolated crest, Virginia City, Gold Hill, Silver City, Dayton and Sutroville are a splendid panorama, seen from our place, while circling far away to the south and west the white domes of the Sierra Nevada glitter in the sunlight with indescribable grandeur. The eastern horizon is scarred and marred by the black trachytic cops of the Diamond range. There is a marked and encouraging change in the lithological conditions of our immediate surroundings, instead of the weird, unsightly, volcanic masses of the deep canyons, the entire bed of the broad plateau is composed of porphyry, diorite and other rocks identical with those of the Comstock. The surface lands of the district are by no means level, on the contrary the entire mesa is corrugated by elevated ridges, and by deep depressions and canyons. The outcrop of the Como lode indicates a strong and permanent ledge, and although the work which has been accomplished in the way of its developments is extremely superficial and imperfect, yet sufficient has been done to prove that the ledge in its immediate vicinity is surprisingly rich in gold and silver. We have here 12 houses, two boarding-houses and one saloon. Inside of 30 days we will enjoy the rattling sound of our new 10-stamp mill; a 5-stamp mill has also been contracted for. The town-site, located on 26th of July, has been surveyed by the County Surveyor to apply for a patent, to prevent the great troubles mining towns generally have to go through by jumpers. Business and mining men will do well to investigate this district. There is a great field for an energetic man to make money. Wood costs $6, instead of $14 as on the Comstock, and there is free water for household and milling purposes. Parties inquiring of the undersigned will receive cheerful answers.

WM. ROSE.

Sun Dance Among the Sioux.

In our last issue we published a few remarks about Indian peculiarities, particularly with reference to dancing. In the same connection, the following graphic description of the annual "sun dance" of the Sioux nation, which took place near the Poplar river, in Montana Territory, about three weeks ago, will prove interesting. The account is taken from a letter received at the Interior Department, from Dr. T. Woodbridge, agency physician for the Fort Peck agency. The Doctor says:

I have just witnessed the great Indian festival of the "sun dance," or worship of the sun. Great preparations had been made for it, and everything was on the grandest scale. The city of lodges was moved, and the Indians encamped on a beautiful plain inclosing a hollow square large enough for the movements of thousands of horsemen. In the center the great pavilion or medicine lodge was erected, 150 feet in diameter, the outside formed of small posts of green poplar and willow, thickly interwoven with green branches. Resting on this and on a rude framework within, all around for about 20 feet the space was covered with buffalo skins, forming the "dress circle," with places assigned to the musicians and actors or dancers. In the center was the great medicine pole, 50 feet high. The diameter of the central space, about 100 feet, was open to the broad sunlight.

Only the men occupied the deep circle, where they were feasted during the performance of 28 continuous hours, during which time about 40 dogs were immolated and eaten, besides large quantities of buffalo meat, wild-turnip heads, and hot caldrons of other eatables that are nameless. The audience was composed of about 5,000 Indians, but as only the men occupied the circle within, the common people, women and boys, had to be satisfied by viewing the performance through the wide entrance or through the enterstices in the leafy barriers. All had on their holiday attire. The dresses of some of the chiefs, and those acting as directors or priests, were gorgeous.

When all was prepared, amid the waving of banners, music, and the loud shouting of the assembled throng, over 50 braves entered—each an Apollo—painted and naked to the waist, except a profusion of ornaments, with headdresses of beautiful feathers, their black, glossy hair reaching down to their lower garments, which were most beautifully and artistically arranged. Each carried in his hand an ornamented whistle, made from the bone of an eagle's wing, which was blown shrilly during the dancing. Each also carried a bouquet, composed mostly of the wild sage. Their appearance and reception were grand and imposing.

The first afternoon's performance would have been called wonderful for display of heroism and power to endure and suffer. Many had from 50 to 200 pieces cut out of the living flesh from their arms and back. The dance was kept up all night with unabated fervor, every performance having something new and startling. But in the morning torture reigned supreme, men dancing with two, three and four buffalo heads suspended from holes cut in their flesh. One Indian dragged on the ground eight buffalo heads fastened to the flesh of his back, and in the stooping posture he was forced to assume they had lacerated or torn the cuts in his back to the extent of three inches. Others were held by four different cords, two in the breast and two in the back, fastened to four stakes; and still others were fastened to the center pole with ropes, which were fastened to the breast and back. Some, in addition to being fastened by the flesh of their breasts, had buffalo heads suspended from the back, and they would be seized by the hanging heads and jerked until one would think their life would be forfeited; others made frantic efforts to break loose, and I often noticed the integument to be stretched three or four inches from the body. Some fell faint and exhausted, and with wild shouts, the din of music and weird songs, made of it a perfect pandemonium.

The dancers neither took food, sleep nor water during the festival. Their dancing, their invocations and their prayers were fervent. They laid their faces on the buffalo heads while praying for success in hunting, and the priest wept and asked the Great Spirit to give them success in the chase and let them have food for their wives and children; also, to give them plenty of horses, to prosper them and help them to subdue their enemies. The sod was carefully removed in a spot four feet square, and within a white cross was made. Their liberality was unbounded. Over 200 horses were given away, besides great quantities of other articles.

ANCIENT TIMBER.—The oldest timber in the world which has been used by man, is supposed to be that found in the ancient temples of Egypt. It is found as dowelpins in connection with stonework which is known to be at least 4,000 years old. These dowels appear to be of tamarisk or shittim-wood, of which the ark is said to have been constructed, a sacred tree in ancient Egypt, and now rarely found in the valley of the Nile.

WHERE TO FIND PLATINUM.—Mr. Edison has received over 3,000 replies to his inquiries for platinum. It can be had from California, North Carolina, Idaho, Dakota, Washington Territory, Oregon, Colorado, Arizona, New Mexico and British Columbia. Many samples of other valuable metals are daily received by him.

MECHANICAL PROGRESS.

Removing Boiler Incrustations.

In order to remove incrustations from the tubes of locomotives, marine and other steam generators, Hermann Esser, of Carlsruhe, says the London *Mining Journal*, proposes to cause the tubes to revolve in contact with a number of comparatively small hard bodies. For the purposes of the invention pebbles are suitable. To effect the removal expeditiously the tube is caused to revolve rapidly, and a receptacle containing the pebbles is traversed to and fro along the tube, the pebbles being pressed into contact with the tube, and being kept wet by means of a stream of water. In an apparatus designed for the purpose a bed similar in form to a lathe bed is provided with fast and following headstocks. The spindle is provided with a scroll-chuck or a suitable chuck for gripping the tube. For convenience the spindle is held by means of a detent and wheel at the time when the tube has to be inserted or removed. The following headstock is fitted with a spindle which is free to revolve in bearings, and is provided with a conical end to enter the tube, and with a tail-pin which takes the thrust. A sliding carriage carries a perforated cradle which holds the pebbles. The cradle is provided with a hinged or removable cover, which, when in position, is pressed towards the tube by means of a spring or weight. The parts are so formed and arranged that the tube is entirely surrounded by pebbles, which are pressed against the tube. A water-pipe or cock is connected by means of an india-rubber tube with a water supply pipe, or is otherwise so connected that the movement of the carriage will not interrupt the water supply. The carriage is traversed to and fro during the rotation of the tube, and the abrading action of the pebbles removes the incrustation, and the particles removed are washed away by the stream of water. A receptacle to receive the water and mud is formed below the cradle, and the receptacle communicates by means of a pipe or spout with a gutter, which runs along the bank of the bed conveys away the water and matters removed from the tube.

Improvements in Colliery Winding Gear. A new system of winding gear, known as Kœpe's patent, which has already been adopted at many of the collieries in Germany and France, is being introduced at some of the collieries in this country, and Messrs. Nasmyth, Wilson & Co., of the Bridgewater foundry, Patricroft, near Manchester, are at present constructing engines and winding apparatus on this principle for the Bestwood Coal Company, Nottingham. The principal feature in the new system consists in doing away with the ordinary draw and the great weight of rope, which, in deep mines, is a very great strain upon the engine. In this system the cages are attached one to each end of the winding rope which passes over the head gear pulleys and over a winding pulley, which takes the place of the draw, and a balance rope of the same weight as the winding rope is fixed to the bottom of each of the cages, the balance rope hanging freely in the shaft and the lower end being allowed to dip into the sump at the bottom. By this method, however deep the shaft, the ropes and cages are always balanced, and the engine in winding up has only to overcome the weight of the coal in the tubs and the friction of the working parts; a steady engine speed is secured, whilst considerably less engine power is required and the risk of overwinding is very much reduced. The system has, we are informed, answered satisfactorily where it has been tried, and is spoken highly of by some mining engineers.—*Colliery Guardian.*

The Origin of Machine-Made Pens.—Joseph Gillott, the first to employ machinery in the manufacture of steel pens, was originally a maker of buckles and other "steel toys," working alone in a garret in a Birmingham "slum." At this time he was engaged to a young woman in his own rank in life, whose two brothers were working, in about the same style as himself, on hand-made pens. Gillott thought he could better the processes employed, and worked secretly in his garret until he had made a press and other appliances, by which he could make 20 times as many pens in a day, and better pens, than was possible under the old methods. He found ready sale for them, and soon the demand outgrew his power of production. At this juncture his sweetheart agreed to his proposal that they should marry and work together, little dreaming of the ultimate issue of their enterprise. In after years Mr. Gillott used to tell how, on the very morning of his marriage, he began and finished a gross of pens, and sold them for £7 4s, before going to church.—*Scientific American.*

Instrument to Detect Color Blindness.—Herr Hirschberg has devised an improved instrument for detecting color blindness, which may be of interest, as the incapacity of many employees of railroads, steamboats, etc., to distinguish colors is attracting much attention in this country. His apparatus is an adaptation of the spectroscope to the requirements of the special case. The spectroscope contains a fixed and a movable collimator tube, so that one spectrum can be moved above the other. By means of a slide in the eye-piece any portion of the double spectrum may be presented to the eye alone, and will then constitute a good object for comparison.

An Induction Balance.

Prof. J. E. Hughes has lately devised an instrument which promises to be of great use in determining the amount of the constituents of alloys. It is based upon the principle that the induced current in a secondary coil depends upon the character and amount of metal which forms the core of the primary. A portion of the apparatus Prof. Hughes calls a sonometer; this consists merely of two primary coils which are placed with opposing poles about a meter apart on a divided scale. Between them slips a secondary coil which is connected with a telephone. If the primary coils are exactly equal, and are traversed by the same electric current, one will hear no sound when the secondary coil is exactly between the primary coils. This point of balance is called the zero of the sonometer. The circuit running through the primary coils is provided with a microphone, and a clock ticking upon the support of the microphone supplies the necessary change of resistance in the electric circuit. If the equality of the sides of the sonometer is disturbed by the introduction of metals on one side or the other, the telephone announces the inequality and the secondary coil has to be moved nearer one primary coil than another. The number of degrees moved is a relative measure of the difference of the metals. The extreme sensitiveness of this balance is shown by numerous experiments. It is also of use as a coin detector—any difference in the quantity or quality of the metal being instantly shown. W. Chandler Roberts, chemist of the mint, has tested Prof. Hughes' balance, and gives a number of curves produced by different alloys, and shows that the balance can detect smaller quantities of metals in the composition of alloys than the methods hitherto used. He suggests also "that the balance may afford a simple means of detecting variations in the molecular structure of alloys and for detecting allotropy in metals with greater accuracy than has hitherto been possible."—*Phil. Mag.*

Electric Jewelry.—A curious application of electricity appears in some specimens of electric jewelry recently described in *La Nature.* Among the specimens are a scarf pin consisting of a small golden rabbit holding a liliputian mallet in each paw, with which it beats a roll on a small golden gong; a golden skull with movable diamond eyes and an articulated jaw. This is also a scarf pin, and its eyes and jaw are made to move in a singular manner. A bird is also shown which is an ornament for the head dress. It is of gold, thickly studded with diamonds. These pieces are connected by a fine concealed wire with a small battery carried in the vest pocket. When the battery is made to operate, the rabbit will strike the gong, the bird will move its wings, and the skull will roll its eyes and gnash its teeth. The battery consists of a zinc and carbon couple contained in a hermetically closed vulcanite case, the zinc and carbon occupying the upper half of and the exciting fluid the lower half of the case. When the case is in a vertical position the exciting fluid does not touch the zinc or carbon, but when it is inverted or placed horizontally, the fluid comes into contact with the zinc and carbon, and the current traverses the coils of the diminutive magnets, which operate the mechanism of the pieces. The mechanism is much like that of an ordinary vibrating electric bell.

Manipulation of Steel.—At the recent meeting of the Iron and Steel Institute at Liverpool, considerable discussion followed the reading, by Mr. Ratcliffe, upon the welding of steel. Mr. Ratcliffe maintained that it was not healthy for the steel to be crystalline. No matter how they worked a piece of iron or steel under the hammer, they got comparatively very little fiber produced in it—in fact, they might make a fibrous iron into a crystalline iron with very simple hammering. He knew of no other process by which they could produce as good a fiber as by rolling. All steel to start with was crystalline. Next to rolling the best way to get fiber in iron and steel was by means of hydraulic pressure, the effect of which was to squeeze and gradually draw the crystals out, whereas, with hammering, it simply knocked them together, and they had hardly time to think where they should stretch.

Cactus Mattresses.—Some ancient Comstockers think they have a fortune in Lower California. There is a plant growing there profusely and promiscuously, a species of dwarf cactuses, which, when properly reduced, makes the best kind of material for mattresses. A hundred thousand dollars have been spent in trying to produce a machine to do this work, but nothing succeeded until a company, a part of whom are Comstockers, fell upon a genius who for $400 completed an experimental machine, which in the most rapid manner produces a mass of white, elastic fiber. These gentlemen assert that they can reduce the cost of mattresses 40% and then make profit, which will cause every man in the company to feel like a thief.—*Arizona Sentinel.*

A Chance for Inventors.—A Buffalo (N. Y.) grape sugar company offers $10,000 "for any appliance to our boilers that will consume smoke and not diminish the quantity of steam now obtained." Perhaps some device could be applied at our Mint to consume the acid fumes belched from the chimney.

SCIENTIFIC PROGRESS.

Forests and Meteorology.

An important paper in *Polybiblion* on this subject gives the results of observations made during the last six years under trees and not far from the edge of a forest, and also in the plain and far from all trees. 1. Forests increase the quantity of meteoric waters which fall on the ground, and thus favor the growth of springs and of underground waters. 2. In a forest region the ground receives as much and more water under cover of the trees than the uncovered ground of regions with little or no wood. 3. The cover of the trees of a forest diminishes to a large degree the evaporation of the water received by the ground, and thus contributes to the maintenance of the moisture of the latter and to the regularity of the flow of water sources. 4. The temperature in a forest is much less unequal than in the open, although, on the whole, it may be a little lower; but the minima there are constantly higher, and the maxima lower than in regions not covered with wood.

These observations have been made in the neighborhood of Nancy, and by the pupils of the School of Forestry of that city, under the direction of M. Mathieu, sub-director of the school. On the other hand, M. Fautrat, when sub-inspector of forests at Senlis, made during four years, but on a different method, observations on forestial meteorology which fully and completely corroborate, in certain respects, those of M. Mathieu. The laws which seem to follow from the figures given by M. Fautrat, as well as an inspection of the curves which graphically represent them, are as follows:

1. It rains more abundantly, under identical circumstances, over forests than over non-wooded ground, and most abundantly over forests with trees in a green condition. 2. The degree of saturation of the air by moisture is greater above forests than over non-wooded ground, and much greater over masses of *Pinus sylvestris* than over masses of leaved species. 3. The leafage and branches of leafed trees intercept one-third, and those of resinous trees the half of the rain water, which afterward returns to the atmosphere by evaporation. On the other hand, these same leaves and branches restrain the evaporation of the water which reaches the ground, and that evaporation is nearly four times less under a mass of leafed forest than in the open, and two and one-third times only under a mass of pines. 4. The laws of the change of temperature out of and under wood are similar to those which result from the observations of M. Mathieu. The general conclusions seem to be that forests regulate the function of water, and exercise on the temperature, as on the atmosphere, an effect of "ponderation" and equilibrium.

Electricity in Flowers.—Last evening a gentleman of this city accidentally made a most singular discovery respecting the electrical influence of the ordinary morning glory vines. Seated near the lattice work, over which the vine was trained, his attention was attracted to a single little branch tipped with a growing line extending straight out from the rest, and speculated within himself whether the tiny hairs with which the stem was clothed were not placed there for the purpose of conducting the electric fluid of the atmosphere to the plant. In order to continue this investigation he approached his finger within a half inch of it, and was amazed to observe a slight—almost imperceptible—yet unmistakable motion of the stem. As he pushed his finger a little nearer the stem trembled very visibly and was seemingly attracted and repelled from him. The hairs which he noticed before did not move, but remained erect. There was no wind at the time and the motion was purely an induced one. After this interesting experiment he placed the end of his finger within a short distance of the growing bud and slowly moved in a circular direction. The stem followed the motion until it was bent in the shape of a letter C, and when the finger was withdrawn instantly regained its former straight position. This last experiment was witnessed by several persons, all of whom tried it with varying success.—*Lafayette (Ind.) Courier.*

Blood of the Lobster.—Harless found copper in the blood of crustaceans, cephalopods and gasteropods. It has long been known that the blood of these three groups of invertebrates changes its color when it is exposed to the air. Jolyet and Regnard concluded that the blood of the crab contains two coloring substances, one blue and the other red. The first is united with the albumen, which, when coagulated by alcohol, has a clear blue tint; the red dye remains in solution in the alcoholic filtrate. Leon Fredericq finds the same principles in the blood of the lobster, but the red contains no metal; it does not change color in oxygen or in a vacuum; it is not always present. The blue seems to be identical with hemocyanine and contains copper. The saline portion of the blood has a composition almost identical with that of the water in which the lobster lives. The hemocyanine easily unites and parts with oxygen and thus acts as a stimulant to respiration, the nutritive function of the blood being confined to the plasma.—*Bull. de l' Acad. Roy. de Belgique.*

The Coloring of Autumn Leaves.—The green coloring matter of leaves has been recently reinvestigated by M. Fremy, and his results shed some light on the cause of the coloration of autumn leaves, although further study is still necessary to account for the manifold brilliant tints to be found in American autumn foliage. M. Fremy's previous studies on chlorophyl tended to prove that it was not a simple coloring matter, but composed of two different substances—a yellow which he named Phylloxanthin and a bluish green named Phyllocyanic acid. His more recent investigations have had for their object to ascertain in what conditions these constituents of chlorophyl exist in the organic tissue, whether mixed or combined, suspended in the liquid or united with the cellular tissue. By means of experiments, he finds that they exist in the leaves as a mere mixture. It yet remains to ascertain whether the phyllocyanic acid existed in a free state, or combined with a base, or united with the cellular tissues by a sort of capillary affinity. Analysis showed the presence of a notable quantity of potassa. The green matter of leaves, then, can be considered as a phyllocyanate of potassa mixed with phylloxanthin. "It has long been known," says M. Fremy, "that leaves in autumn lose their green appearance, changing to yellow, and also give off a large portion of their alkali. Now we know that this process depends upon the decomposition of the phyllocyanate of potassa."—*Ex.*

The Camphor Eddies.—If a small bit of camphor is laid upon water it begins turning and moving about with great rapidity. If a few grains of lycopodium or other light powder have been previously scattered on the water they are drawn towards the camphor by eddies in an inverse direction. These phenomena were first observed in 1748 by Romien, who attributed them to the difference of electricity between the water and the camphor. Subsequent investigators thought they might be due to the camphor vapor striking the water and producing a recoil. M. Cassamajor has resumed the study of the question and adopted the views of Romien. He instances the following crucial experiment. At the same time that the bits of camphor are thrown upon the water insert a glass rod which has been rubbed with flannel; the motion immediately stops. If the electricity is removed from the rod by rubbing it with tin foil, it loses its power of checking the eddies.—*Les Mondes.*

Incombustible and Impermeable Wood.—M. Folbacci uses the following preparation: Sulphate of zinc 55 lbs, potash 22 lbs, alum 44 lbs, oxide of manganese 22 lbs, sulphuric acid of 60°, 22 lbs, water 55 lbs. All the solid ingredients are put into a boiler containing the water at 45° C. (113° F.), and as soon as they are dissolved the sulphuric acid is poured in gradually until the mass is completely saturated. The pieces of wood are kept about five centimeters (1.97 in.) apart, and after three hours' boiling they are dried in the open air. The natural appearance of the wood is not changed; to whatever heat it is subjected, it resists combustion, the surface being simply covered with a thin charred coating which is easily rubbed off.—*Ann. du Genie Civil.*

Animal Electricity.—An important paper on the results of recent researches in animal electricity is published in the *Nature.* The author, Dr. L. Herman, states that the whole of the electrical phenomena of muscle and nerve may be readily deduced from a few very simple propositions. Irritable protoplasm responds both to destructive and to exciting influences by an electromotive sign. The altered substance takes on a negative potential with respect to the unaltered. This, together with the doctrines of internal transverse polarization and of the polarizational increment of excitation, appears fully competent to explain all the facts hitherto observed.

American Scientific Association.—Next year the American Association for the Advancement of Science will hold its meetings in Boston, commencing on the last Wednesday of August. The officers are: President—L. H. Morgan, of Rochester; Vice-President, Section A—Asaph Hall, of Washington; Vice-President, Section B—Alexander Agassiz, of Cambridge, Mass.; Permanent Secretary—F. W. Putnam, of Cambridge, Mass.; General Secretary—John K. Rees, of St. Louis; Secretary of Section A—Henry B. Nason, of Troy, New York; Secretary of Section B—C. V. Riley, of St. Louis; Treasurer—William S. Vaux, of Philadelphia.

Fire-Damp in Mines.—For the purpose of ascertaining the presence of fire-damp in mines, Mallard and Le Chatelier use a lit jet of hydrogen, which gives a larger and more distinct blue aureola than the flame of the common safety lamp when the quantity of the dangerous gas is even very small. This expedient has revealed the presence of 0.25% of fire-damp. The flame which is inclosed in a copper tube, is viewed through a lens in the side of the tube.

Igniting Tinder.—The common experiment of igniting tinder by compression in a glass tube does not always succeed; the tinder may not be ignited, or may not retain its glow after the piston is withdrawn. Tyndall uses sulphide of carbon vapor instead of tinder. Hofmann says both may be advantageously replaced with gun cotton.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Oct. 9.		Week Ending Oct. 15.		Week Ending Oct. 23.		Week Ending Oct. 29.	
Alpha	17¾	16	16⅝	15½	15¾	14¼	15	13½
Alta	5¾	5	6	5	6½	5½	5¾	5
Andes	1.20	1.05	1.30	1	1.15	1	1.20	1.05
Alps	....	....	....	....	....	....	....	....
Argenta	85c	75c	1.05	75c	1	80c	1	90c
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	....	....	10c	....	....	....	....	....
Baltimore Con	....	....	....	....	....	....	....	....
Belcher	3.85	3.65	4.60	3.65	4	3¾	4.15	3.60
Belmont	65c	50c	1.10	50c	1.30	80c	1	60c
Best & Belcher	17½	16⅝	19¾	17¼	18½	17¼	18½	17
Bullion	10	8	8⅝	7¼	7¼	7	7½	5¾
Bechtel	1.15	1	1½	1¼	1½	1¼	1.45	1¼
Belle Isle	4.95	4.05	4.65	4.10	4¼	4¼	4.90	4¼
Bodie	13¼	10½	13	12¾	13⅝	12¼	14½	13⅝
Benton	3	2.85	3½	2¾	4.10	3.15	3.70	3½
Bulwer	11¼	11	12	11½	11⅝	11¼	11¾	11¼
Boyle	....	....	....	....	....	....	....	....
Black Hawk	1.10	75c	95c	75c	80c	55c	80c	75c
Belvidere	1¾	80c	85c	50c	75c	....	70c	50c
Booker	80c	55c	90c	60c	80c	65c	90c	70c
Caledonia	2.40	2.15	2¼	2.20	2.65	2.30	2.35	2.10
California	5¾	5¼	6¼	5	5¾	5¼	5¾	5
Challenge	2¼	2.10	2.40	2	2.20	2	3¼	2
Chollar	7	6⅝	7¾	6¾	7	6⅝	7¾	6½
Confidence	10	9	10¾	9½	10	9	11⅝	9½
Con Imperial	1.30	1.20	1¼	1.05	1.15	1.05	1.10	1
Con Virginia	5¾	5¼	6¾	5	5¾	5¼	5¾	5¼
Crown Point	4.20	4	4.45	4.10	4.10	3.90	4¼	3½
Con Washoe	....	....	....	....	....	....	....	....
Champion	30c	25c	25c	20c	25c	15c	25c	15c
Concordia	....	....	....	....	....	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	1.30	1.10	1.15	70c	1¼	75c	85c	70c
Eureka Con	25½	24½	28	20	26¾	24	29½	24½
Exchequer	6¾	5¼	6	5½	5⅝	5	6	4.45
Endowment	50c	....	55c	50c	50c	40c	....	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	2.10	2	2.20	2	2⅝	2	2½	....
Olla	25c	20c	30c	25c	30c	15c	20c	5c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	13	....	12½	12	11⅝	....	12	11⅝
Goodshaw	30c	20c	35c	30c	40c	35c	50c	30c
Gould & Curry	10¼	9¼	12	10	10½	9¾	11¼	9½
Hale & Norcross	12¾	11¼	15⅞	13¼	14⅝	13½	15½	13
Hillside	2	1¾	1.90	1¾	1.90	1.85	1.80	1.65
Highbridge	....	....	....	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	15c	10c	15c	....	15c	....	15c	....
Independence	1¾	1.55	1¾	1¼	1.70	1¼	1.65	1.10
Julia	4.05	3.80	4.10	3¾	3.95	3¾	3.65	3.20
Justice	3.30	3.05	3½	3.10	3.20	2.85	3.05	2.20
Jackson	4½	4	4	....	4	3½	4¼	4
Joe Scates	....	....	....	....	....	....	....	....
K K Con	1	....	....	....	....	....	....	....
Kentuck	4.15	4	4.40	4	4	3.95	4	....
Kossuth	....	....	....	....	....	....	15c	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	1	75c	90c	75c	80c	60c	75c	65c
Lady Wash	1	85c	1.10	20c	1.20	1	1.05	95c
Leopard	60c	....	55c	50c	55c	50c	50c	....
Leviathan	60c	50c	60c	55c	60c	50c	60c	50c
Leeds	60c	....	....	....	55c	50c	60c	50c
Lee	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	25c	....	25c	....
Modoc	1	....	1	90c	....	....	35c	10c
Manhattan	2¾	2½	2¾	....	2¾	....	2¾	2½
Martin White	2	1½	1¾	1⅝	1¾	1½	1.80	1¾
McClinton	65c	60c	65c	30c	35c	....	50c	40c
Meadow Valley	5c	....	5c	....	....	....	....	....
Mexican	32¾	31¼	43¾	32½	36½	34	38	33
Mides	....	....	....	....	....	....	....	....
Morning Star	3	....	....	....	....	....	....	....
North Con Virginia	9½	8	9½	....	....	....	....	....
New York	55c	40c	60c	40c	60c	35c	40c	30c
Northern Belle	3⅝	3½	4	3.60	5¾	4⅝	5⅝	5
New Coso	....	....	....	....	....	....	....	....
Navajo	50c	35c	65c	40c	50c	35c	50c	45c
Occidental	2¾	2.30	2½	2¼	2½	2¼	2.40	2
Ophir	36½	33	38¾	34½	36	32	34¼	30
Oriental	15c	10c	40c	10c	40c	35c	50c	30c
Overman	9½	9	9⅝	9	9⅝	9	9½	8½
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	....	....	....	....
Phil Sheridan	25c	20c	60c	20c	60c	35c	50c	35c
Potosi	6¼	5⅝	6½	5⅝	5⅞	5¼	6	5
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	1¼	1.10	1¼	1.15	1¼	1.20	1¼	1.20
Richer	....	....	25c	....	25c	....	25c	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	12⅞	11¾	14¾	12½	13	11¼	15½	12¼
Seg Belcher	....	....	....	....	....	....	20c	....
Sierra Nevada	49½	47	66½	50	64½	56	61½	56
Silver Hill	1½	1¼	2	1.30	1.40	1.20	1¼	1.15
Silver King	6	5	6	....	6⅞	6	6¾	6½
Silver Prize	....	....	....	....	....	....	....	....
Succor	....	....	....	....	25c	20c	30c	25c
Summit	1½	1¼	1.60	1¼	1.55	1.40	1.86	1¼
Scorpion	3.60	3.30	6⅜	3.40	5½	4¾	5½	4¾
Solid Silver	30c	....	30c	15c	25c	20c	5c	....
South Bodie	25c	20c	20c	....	15c	....	25c	15c
South Standard	....	....	20c	....	10c	....	....	....
Star	70c	60c	65c	50c	60c	55c	55c	50c
St. Louis	30c	....	....	....	....	....	....	....
Syndicate	5	....	6¼	4.90	7	5¾	6¾	6
Tioga Con	2¾	2.60	3¼	2.60	3.60	3¼	3¾	3.40
Tiptop	1.20	1.10	1¼	1.10	1.30	1.20	1.40	1.30
Trojan	20c	15c	20c	15c	20c	15c	15c	10c
Union Con	67¾	64	94	70	76	69	90½	73
Utah	20¾	19½	27½	20¼	25	21½	22¾	20
Vermont Con	....	....	....	....	....	....	....	....
Ward	3	2.70	2.85	2.65	2¾	2½	2½	2.15
Wells-Fargo	....	....	20c	10c	20c	10c	15c	10c
Woodville	40c	....	40c	30c	30c	....	35c	25c
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	16	15	17	15½	15¾	14½	17½	14

Sales at S. F. Stock Exchange.

Friday A. M., Oct. 24.

370 Alta ....5@5½
290 Andes ....1.05@1.10
295 Alpha ....13¾@13½
1295 Bullion ....5⅝@5¾
445 Belcher ....3.60@3⅝
165 Best & Belcher ...17½@17
565 Benton ....3¼@3.40
160 California 5½
1655 Con Imperial ....1@1.05
215 Crown Point ...3.80@3.85
315 Caledonia ....2.10@2¼
210 Con Virginia ....5⅝@5¼
110 Chollar ....6¾@6¾
150 Challenge 2.10
1035 C Dorado ....2 @2.45
170 Exchequer ....4.45@4.65
100 Fairfax 70c
400 Flowery 40c
305 Gould & Curry ....9¾@9½
500 Golden Gate 2
30 Hale & Nor 13
920 Julia ....3.20@3¼
510 Justice ....2.70@2½
30 Kentuck 4
50 Leviathan 55c
1075 Lady Wash ....95c@1
1835 Lady Bryan ....75@65c
730 Mexican ....33@33¼
755 Mackey 50c
680 N Bonanza 1¼
470 New York ....30@35c
435 Occidental ....2¼@2
455 Ophir ....30@30¼
60 Overman ....9@8⅝
300 Potosi ....5@5⅛
510 Phil Sheridan 40c
160 Savage ....12⅝@12¼
1610 Scorpion ....4.60@4½
140 Silver Hill ....1¼@1.20
1200 Succor 25c
320 Sierra Nevada ....56½@56
1100 S Utah ....15@10c
300 Trojan ....15@10c
245 Utah ....20@20¼
835 Union Con ....73@73¼
3900 Wells Fargo 10c
360 Ward ....2¼@2.15
360 Yellow Jacket ....14¼@14

AFTERNOON SESSION.

200 Albion 15c
300 Argenta 95c
200 Adenda 35c
1100 Atlas 50c
350 Boston ....1.45@1½
225 Booker ....75@70c
75 Bodie 14
1750 Bechtel ....1.40@1.45
1705 Belle Isle ....4.40@4½
700 Big Prize ....30@35c
500 Champion 25c
210 Calcdonia (B H) 2
155 C Pacific ....7¼@7⅝
230 Dudley ....1.20@1¼
300 Day ....85@80c
300 D Standard 25c
130 Eureka Con ....25@24½
300 Grand Prize 2⅛
250 Gila ....15@10c
100 Golden Terra ....12@11⅞
250 Goodshaw ....50@40c
100 Hillside 1.80
150 Independence ..1.60@1.65
10 Jackson 4½
890 Jupiter ....2@2¼
50 Manhattan 2¾
400 Mammoth 6¼
515 Mono ....7@7¼
600 Metallic ....80@90c
200 McClinton 50c
200 Modoc 10c
500 Mt Diablo ....9@8¾
100 N Belle Is 25c
400 Navajo ....45@50c
510 Noonday 3
950 N Noonday ....3.90@3¾
200 Northern Belle ....5¾@5⅝
200 Orient 25c
300 Oriental 40c
430 Paradise 1¼
180 Queen Bee ....25@30c
100 Richer 25c
1275 Ray'd & Ely 1¼
70 S Bulwer ....40@35c
200 Silver King 6⅝
250 Star 55c
620 S Bodie ....20@15c
350 Syndicate ....6½@6
1110 Tuscarora ....1¼@1.15
750 Tiptop ....1.40@1.35
170 Tioga Con 3.45
500 University 25c
500 Vortex 40c
40 Wales 9½

Saturday A. M., Oct. 25.

50 Altas 45c
100 Alpha 14
230 Alta ....5¼@5½
150 Andes ....1.10@1.05
100 Argenta 90c
300 Albion 15c
100 Addenda 35c
245 Bullion ....6⅝@6¾
155 Best & Belcher ...18¼@18
95 Belcher ....3.60@3⅝
380 Benton ....3⅝@3.70
100 Belmont 80c
365 Belle Isle ....4.65@4½
120 Bodie ....13⅝@14
15 Belvidere 50c
150 Boston ....1.45@1½
150 Bechtel 1.40
100 Bulwer 11½
50 Booker 75c
210 California ....5¼@5¾
590 Con Virginia ....5¼@5⅝
150 Chollar 7
150 Crown Point ....3.90@3¾
720 Con Imperial 1.05
115 Confidence ....9¾@10
100 Caledonia 2¼
120 Challenge ....2¼@2.30
100 C Pacific ....7⅝@7¼
150 Champion 20c
750 Con Dorado ....2.60@2½
200 Dudley 1
850 Day 85c
380 Exchequer ....4.90@4.80
275 Eureka Con ....25¼@25
100 Fairfax 75c
230 Gould & Curry ....9⅞@10
700 Golden Gate 10
50 Gila 15c
300 Goodshaw 40c
250 H & Norcross ....14@13⅞
100 Hillside 1.70
540 Independence 1½
100 Justice 2.85
230 Julia ....3¼@3.20
425 Jupiter ....1.90@1.80
50 Jackson 4¼
25 Kentuck 4
300 Lady Bryan ....65@70c
550 Leviathan ....55@50c
100 Lady Wash ....1.05@1
100 Leopard 50c
430 Mexican ....35¾@36
860 Mackey 40c
40 M White 1¾
750 Metallic ....80@90c
300 Mammoth 6
110 McClinton ....65@45c
20 Mono 6½
550 N Bonanza 1.15
50 Navajo 50c
250 N Noonday 3½
80 Overman 9
490 Ophir ....33@33¼
150 Occidental 2.10
200 Orient 25c
200 Oriental 50c
385 Potosi ....5½@5½
100 Phil Sheridan 45c
500 Paradise 1.40
375 Raymond & Ely 1¼
350 Savage ....13@12⅞
2300 Succor 25c
500 S Bulwer 45c
740 Sierra Nevada ...60½@61½
300 Silver Hill 1¼
5 Seg Belcher 20
506 Scorpion ....5@5⅜
300 Solid Silver 5c
500 S Utah ....15@10c
250 Star 55c
300 Summit ....1¾@1.85
100 Syndicate 6½
100 Silver King 6½
200 Tioga ....3¾@3.45
200 Trojan 15c
600 Tuscarora 90c
860 Union Con ....84@85
160 Utah ....22¼@22
375 University 25c
100 Vortex 40c
50 Ward 2¼
2500 Wells-Fargo ....15@10c
200 Yellow Jacket ...14½@14¼

Monday A. M., Oct. 27.

150 Alpha 14
75 Alta ....5¼@5½
50 Andes 1.10
150 Benton ....3.80@3¾
125 Best & Belcher 18
370 Bullion ....6⅝@6½
140 Belcher ....3.80@3.90
320 California 5½
315 Con Virginia 5¼
50 Confidence 9½
800 C Dorado ....2¾@2.60
125 Challenge 2.30
15 Caledonia 2¼
525 Con Imperial ....1.05@1
70 Crown Point 3¾
100 Chollar 7
310 Exchequer ....4.85@4.80
100 Flowery 40c
1200 Golden Gate 2
170 Gould & Curry ....10@9⅝
35 Hale & Nor ....13⅞@13¾
195 Julia ....3.35@3.40
250 Justice ....3@2.95
410 Kentuck 4
100 Kossuth 15c
50 Lady Wash 1.05
100 Leviathan 60c
50 Lady Bryan ....70@65c
795 Mexican ....36@36½
940 Mackey ....40@25c
210 N Bonanza ....1.20@1¼
115 Ophir 33¼
20 Occidental 2¼
20 Overman 9½
200 Potosi 6½
905 Sierra Nevada ....59½@60
370 Scorpion ....5¼@5½
110 Savage ....13@13⅛
2500 Succor 25c
900 Trojan 15c
20 Utah 21½
1130 Union Con ....85½@86½
10 Ward 2.35
1600 Wells-Fargo ....10@15c
290 Yellow Jacket ....15@14¾

AFTERNOON SESSION.

810 Argenta 90c
200 Albion ....15@10c
200 Adenda ....45@50c
550 Altas 50c
100 Boston 1½
100 Black Hawk 75c
280 Booker ....75@80c
30 Belvidere 70c
800 Belle Isle ....4.70@4.60
630 Belmont ....80@70c
20 Bulwer 11¾
110 Bodie 14¼
530 Bechtel ....1.30@1¼
580 Champion ....20@15c
510 Caledonia (BH) 2
70 C Pacific 7½
525 Day ....75@80c
450 Dudley ....1.10@1¼
405 Eureka Con ....30@29½
160 Grand Prize 2½
300 Gila 15c
200 Hillside ....1¾@1.65
200 Independence 1½
10 Jackson 4
920 Jupiter ....2@1.85
200 Leeds 60c
250 Leopard 50c
75 Mammoth 6½
150 May Belle 25c
50 M White 1.80
100 McClinton 50c
200 Modoc 25c
70 Mt Diablo 8
300 Metallic ....85@75c
30 Mono 7
200 Northern Belle ....5¾@5½
1700 N Belle Is ....25@50c
350 N Noonday ....3½@3.55
350 Navajo 45c
450 Orient 30c
240 Oriental 50c
400 Paradise 1¼
100 Queen Bee 30c
130 Raymond & E 1¼
85 Real del Monte ....4@3¾
120 Silver King 6¾
400 S Bulwer ....40@35c
130 Syndicate ....6¾@6½
200 S Bodie ....20@25c
200 Star 50c
220 Tuscarora 80c
200 Tioga Con ....3½@3.45
150 Tiptop 1.40
550 University 25c
200 Vortex 40c

Tuesday A. M., Oct. 28.

525 Andes ....1.10@1.05
100 Alta 5⅝
50 Alpha 14
380 Belcher ....3.85@3.60
80 Benton 3½
420 Bullion ....6⅝@6¾
20 Best & Belcher 17¼
130 California ....5¼@5¾
10 Confidence 9½
675 Con Imperial ....1.05@1
650 Con Dorado 2.80
50 Challenge 2.30
110 Caledonia 2¼
375 Crown Point ....3.60@3½
615 Con Virginia ....5¼@5⅝
500 Exchequer ....4.85@4½
400 Fairfax 75c
500 Flowery 45c
1085 Golden Gate 2
135 Gould & Curry ....9⅝@9⅝
60 H & Norcross 13½
210 Julia ....3.35@3.40
140 Justice ....2.85@2.90
60 Kentuck 4
100 Kossuth 15c
525 Lady Wash 1
100 Leviathan 55c
150 L Bryan 70c
260 Mexican 35
570 Mackey 25c
530 N Bonanza 1.20
100 New York 40c
165 Ophir ....31½@32
200 Occidental ....2.30@2¼
30 Overman 8½
270 Potosi 5½
600 Phil Sheridan ....35@40c
200 Plutus 2.40
185 Silver Hill 1.20
1000 Solid Silver 5c
260 Scorpion 5
25 Savage ....12⅝@12½
850 Sierra Nevada ...58½@58¾
3000 Succor 25c
20 Seg Belcher 20
150 Trojan 15c
480 Union Con ....84@84¾
80 Utah ....20½@20¼
4100 Wells-Fargo ....15@10c
300 Ward 2.40
50 Woodville 25c
140 Yellow Jacket ....15@14⅝

AFTERNOON SESSION.

1710 Addenda 45c
350 Atlas ....50@45c
1330 Argenta ....90@95c
300 Albion 15c
200 Belmont 60c
1380 Belle Isle ....4.70@4.60
400 Booker ....75@80c
90 Bulwer 11½
40 Bodie 14
100 Boston 1½
50 Black Hawk 80c
120 Belvidere ....70@60c
100 Bechtel 1.35
105 Champion 25c
75 C Pacific ....7½@7¾
100 Caledonia (B H) 2
1100 Dudley 1¼
350 Day ....75@70c
200 D Standard 50c
125 Eureka Con ....25@24¾
40 Golden Terra 12
200 Gila ....10@5c
250 Goodshaw 35c
100 Grand Prize 2½
555 Hussey 15c
400 Hillside ....1¾@1.65
600 Independence ....1.10@1½
50 Jackson 4
685 Jupiter ....2@2¼
690 Leopard 50c
310 Manhattan 2½
50 Martin White 1.80
50 Mammoth 6½
250 May Belle 25c
165 Mono ....7@6¾
220 McClinton ....50@40c
100 Metallic 65c
100 Mt Diablo 8¼
1785 N Belle Is ....25@30c
500 Noonday 3½
2000 N Noonday ....3.70@4
100 Northern Belle 5
950 Navajo ....45@50c
1050 Oriental ....30@35c
750 Orient ....30@35c
470 Queen Bee 30c
600 Raymond & Ely 1¼
100 Real del Monte 5
335 Syndicate ....6½@6⅝
50 S Bulwer 30c
50 S Bodie 20c
60 Tioga ....3.40@3.45
140 Tuscarora 75c
570 Tiptop ....1.40@1.30
475 University ....25@20c
300 Vortex ....40@45c
70 Wales 7

Wed'sday A. M., Oct. 29.

220 Alpha ....14@13¾
60 Alta 5¼
120 Andes 1.10
30 Benton 3½
100 Best & Belcher ....17⅝@18
365 Bullion ....6⅝@6¾
70 Belcher ....3⅝@3.70
20 Confidence 9½
1200 Con Imperial ....1.05@1
80 Crown Point ...3.60@3.65
580 Con Virginia 5½
245 California ....5¼@5½
550 Con Dorado ....2.80@2¾
320 Challenge ....2.40@2
40 Caledonia 2¼
50 Exchequer 4.80
100 Fairfax 75c
50 Flowery 45c
100 Gould & Curry 9⅞
600 Golden Gate 2
130 Hale & Nor ....14¼@14⅝
220 Julia ....3.40@3¼
265 Justice 2.90
60 Lady Bryan 70c
200 Leviathan 50c
400 Lady Wash 1
860 Mackey ....25@30c
260 Mexican ....35½@35¾
380 N Bonanza 1.15
50 New York 35c
30 Occidental 2.20
25 Overman 9
225 Ophir ....33@32½
300 Plutus ....2½@2.45
190 Scorpion ....5@4.80
70 Silver Hill ....1.20@1.15
35 Savage ....13¼@13
2000 Succor 30c
470 Sierra Nevada ....58@57¾
20 Utah 21¼
895 Union Con ....84@85
3450 Wells-Fargo 10c
195 Ward ....2¼@2.40
95 Yellow Jacket 15½

AFTERNOON SESSION.

300 Addenda ....45@50c
700 Albion 20c
250 Atlas 40c
2330 Argenta ....95c@1
1000 Belmont ....80c@1
700 Boston ....1½@1.40
50 Black Hawk 80c
110 Bulwer ....11½@11¼
200 Booker ....85@90c
460 Bodie 14
380 Belle Isle ....4.90@4.85
740 Bechtel ....1.35@1.45
600 Belvidere 70c
400 Champion 20c
590 Caledonia (B H) ....2@1⅞
375 C Pacific ....8@7¾
500 Day ....75@70c
810 Dudley ....1¼@1.10
60 Eureka Con ....29@28½
50 Goodshaw 30c
1500 Gila 10c
850 Hillside 1.70
200 Independence 1.45
360 Jupiter ....2¼@2.40
10 Jackson 4½
400 Leopard 50c
50 Leeds 50c
600 Martin White ....1¾@1.80
155 Mammoth ....6½@6¼
60 Mono ....6¼@6¾
300 May Belle 25c
200 McClinton 50c
100 Modoc 35c
150 Metallic 75c
335 Mt Diablo ....8¼@9
975 N Belle Is ....25@30c
150 Northern Belle ..5⅜@5¾
50 Navajo 45c
100 Noonday 3.60
1120 N Noonday ....3.80@3.90
500 Oro 15c
1280 Oriental ....35@30c
200 Orient 35c
400 Paradise 1.05
260 Queen Bee ....30@35c
40 Real del Monte 5
310 Raymond & E ...1.20@1¼
250 Silver King 6¾
100 Star 50c
875 S Bulwer ....30@25c
100 Summit 1¼
140 Syndicate ....6¼@6½
90 Tioga Con 3.45
1650 Tiptop ....1.40@1.30
1340 Tuscarora ....80@95c
400 University ....25@20c
400 Vortex ....40@45c

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Argonaut M & M Co	California	2	10	Oct 7	Nov 15	Dec 8	J L Fields	240 Montgomery st
Bechtel Con M Co	California	3	15	Oct 1	Nov 5	Nov 25	W H Lent	309 Montgomery st
Benton Con M Co	Nevada	2	50	Sept 17	Oct 22	Nov 10	W H Watson	302 Montgomery st
Champion M Co	California	4	20	Oct 15	Nov 20	Dec 9	Jno Crockett	203 Bush st
Gila S M Co	Nevada	5	25	Sept 30	Nov 3	Nov 24	W W Parrish	328 Montgomery st
Grand Prize M Co	Nevada	2	50	Sept 17	Oct 21	Nov 11	J E Dixon	20 S F Stock Ex
Hale & Norcross S M Co	Nevada	62	1 00	Sept 9	Oct 14	Nov 4	J F Lightner	58 Nevada Block
Jupiter M Co	California	5	30	Sept 18	Oct 21	Nov 10	E C Masten	22 Nevada Block
K K Con M Co	Nevada	9	2 00	Oct 3	Nov 5	Dec 3	B B Minor	309 Montgomery st
Mexican G & S M Co	Nevada	8	1 50	Sept 11	Oct 15	Nov 6	C L McCoy	203 Bush st
Murchie G & S M Co	California	2	25	Oct 9	Nov 8	Dec 8	S D Rogers	328 Montgomery st
New York M Co	Nevada	20	30	Oct 22	Nov 24	Dec 16	D L Thomas	203 Bush st
Real Del Monte M Co	Nevada	8	1 00	Sept 18	Oct 20	Nov 29	C V Hubbard	203 Bush st
Rough & Ready Con G M Co	California	1	05	Oct 15	Nov 19	Dec 9	W H Lent	309 Montgomery st
Savage M Co	Nevada	39	1 00	Sept 22	Oct 31	Nov 20	E B Holmes	309 Montgomery st
Silver Hill M Co	Nevada	8	50	Oct 16	Nov 19	Dec 11	W E Dean	203 Bush st
Solid Silver G & S M Co	Nevada	2	25	Oct 6	Nov 10	Dec 8	J J Applegate	320 Sansome st
South Standard M Co	California	5	15	Sept 11	Oct 15	Nov 3	C A Sankey	331 Montgomery st
Succor M & M Co	Nevada	24	25	Aug 30	Oct 13	Nov 3	Wm H Watson	302 Montgomery st
Tioga Con M Co	California	7	30	Sept 10	Oct 15	Nov 4	W H Lent	62 Nevada Block
Utah S M Co	Nevada	27	2 00	Oct 22	Nov 25	Dec 13	G C Pratt	309 Montgomery st
Yellow Jacket S M Co	Nevada	24	1 00	Oct 13	Nov 18	Dec 18	Mercer Otey	Gold Hill, Nevada

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Hydraulic Grav M Co	California	1	20	Oct 2	Nov 10	Dec 13	James Ireland	216 Sansome st
Butte Creek Hyd M Co	California	3	15	Sept 18	Oct 20	Nov 5	R L Taylor	310 Pine st
De Haro M Co	Nevada	2	10	Sept 24	Oct 27	Nov 12	W W Bausman	409 California st
Double Standard G M Go	California	1	10	Sept 13	Oct 21	Nov 11	W H Lent	309 Montgomery st
Diana G & S M Co	Nevada	4	10	Sept 24	Nov 17	Dec 5	J T McGeoghan	318 Pine st
Equitable Tunnel & M Co	Utah	21	10	Sept 16	Oct 21	Nov 14	C J Collins	227 Montgomery st
Geo Douglas M Co	Nevada	3	10	Sept 24	Oct 27	Nov 13	W W Bausman	409 California st
Hamburg M Co	Nevada	1	1 00	Sept 19	Oct 21	Nov 10	D A Jenning	401 California st
Joe Scates Con S M Co	Nevada	4	10	Sept 24	Oct 27	Nov 13	W W Bausman	409 California st
J & K G M Co	California	1	15	Sept 29	Nov 3	Nov 24	W H Lent	309 Montgomery st
Mammoth Grove M Co	California	1	02	Oct 9	Nov 13	Nov 29	A B Paul	328 Montgomery st
Maybelle Con M Co	California	3	10	Sept 8	Oct 15	Nov 10	A W Fox	310 Pine st
Mayflower G M Co	California	6	10	Oct 9	Nov 12	Dec 9	J Morizio	328 Montgomery st
McClinton M Co	California	4	25	Oct 10	Nov 14	Dec 4	W H Lent	309 Montgomery st
Meadow Valley M Co	Nevada	15	25	Sept 12	Nov 12	Dec 8	T W Colhurn	414 California st
Mono and Cross Con M Co	California	1	10	Oct 8	Nov 12	Nov 29	J M Buffington	309 California st
Monte Cristo Con M Co	California	1	10	Oct 3	Nov 17	Dec 15	Butler Burris	309 Montgomery st
Mt Hood M Co	Nevada	3	10	Sept 24	Oct 27	Nov 13	W W Bausman	409 California st
Nob Hill G & S M Co	California	1	15	Oct 6	Nov 10	Nov 28	J H Sayre	330 Pine st
North Scorpion M Co	Nevada	1	10	Aug 11	Nov 3	Nov 20	T B Ludlum	211 Sansome st
Numa M Co	Nevada	2	02	Oct 23	Nov 24	Dec 15	D Wilder	328 Montgomery st
Orion M Co	California	5	30	Oct 9	Nov 10	Nov 25	P Conklin	28 Sansome st
Quartz Mountain G M Co	California	7	50	Sept 20	Oct 27	Nov 17	E Hestres	729 Montgomery st
Rustler G M Co	California	2	10	Oct 21	Nov 24	Dec 12	A F Main	309 California st
Sabine M Co	Nevada	2	10	Sept 24	Oct 27	Nov 12	W W Bausman	409 California st
San Xavier M & S Co	Arizona	1	25	Oct 14	Nov 17	Dec 8	F A McGee	32 Merchants' Ex
South Comstock G & S M Co	Nevada	6	25	Sept 9	Oct 13	Nov 3	J M Buffington	309 California st
South Bulwer G M Co	California	5	25	Oct 27	Nov 29	Dec 20	W Stuart	320 Sansome st
Slate Creek G M Co	California	2	10	Sept 15	Oct 20	Nov 10	J L Fields	240 Montgomery st
Tolo M Co	Nevada	2	10	Sept 24	Oct 27	Nov 12	W W Bausman	409 California st
Vancouver M Co	Nevada	3	10	Sept 24	Oct 27	Nov 13	W W Bausman	409 California st
Wide Awake P & M Co	Arizona	8	03	Oct 11	Nov 11	Dec 11	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
America M Co	California	J E Mason	306 Pine st	Annual	Nov 11
Maryland Con G & S M Co	California	E P Farnsworth	202 Sansome st	Annual	Nov 14
McClinton M Co	California	W H Lent	309 Montgomery st	Annual	Nov 4
Napa Con Q M Co	California	W W Parrish	328 Montgomery st	Annual	Nov 12
North Noonday	California	A W Fox	310 Pine st	Annual	Nov 4
Occidental Con G M Co	California	W T Smith	402 Montgomery st	Annual	Nov 1
Real del Monte M Co	California	C V Hubbard	203 Bush st	Annual	Nov 6
Western M Co	California	C S Curtiss	203 Bush st	Annual	Nov 3

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Belle Isle M Co	Nevada	John E Dixon	Stock Exchange	75	Oct 6
Bodie Con M Co	California	W H Lent	Nevada Block	50	Nov 1
California M Co	Nevada	C P Gordon	23 Nevada Block	50	Aug 17
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	50	Aug 16
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	2 00	Oct 20
Independence M Co	Nevada	John E Dixon	Stock Exchange	25	Aug 21
Indian Queen M & M Co	——	A K Durbrow	69 Nevada Block	20	Aug 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	July 26
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	30	July 28
Montezuma M & M Co	——	J T McGeoghegan	318 Pine st	25	Aug 12
Pioneer M Co	California	J W Pew	310 Pine st	08	October 6
Standard Con M Co	California	Wm Willis	309 Montgomery st	50	Oct 13

SALES OF LAST WEEK AND THIS COMPARED

Thursd'y A. M., Oct. 23.

150 Alpha 14¾
80 Alta ....5¼@5¾
460 Andes ....1.10@1.05
90 B & Belcher ....17¾@17½
40 Belcher 3.90
425 Bullion ....7@7¼
480 Benton 3.60
360 California ....5⅝@5½
600 Con Virginia ....5⅝@5¾
190 Chollar ....6⅞@6¾
35 Crown Point 3.90
260 Con Imperial 1.10
125 Confidence 10
200 Caledonia ....2.30@2.35
290 Challenge ....2@2.10
950 C Dorado ....2.70@2½
250 Exchequer ....5@5⅛
100 Fairfax 75c
75 Gould & Curry ....9¾@9⅞
640 Golden Gate 2
45 Hale & Nor 13½
35 Julia ....3.60@3½
70 Justice ....2.90@2.85
1400 Lady Bryan ....75@80c
750 Leviathan 55c
265 Lady Wash ....1.10@1
390 Mexican ....34@34½
390 Mackey 60c
505 New York ....45@35c
100 North Carson 10c
490 N Bonanza ....1¼@1.30
315 Ophir ....33@32
370 Occidental ....2.40@2¼
215 Potosi ....5½@5¼
200 Phil Sheridan 40c
95 Savage 12¾
715 Sierra Nevada ...57½@58¾
370 Silver Hill ....1¼@1.20
3220 Succor 25c
535 Scorpion ....5¼@5
200 S Utah 15c
200 Trojan 15c
50 Utah ....22@21½
1175 Union ....74@75
2200 Wells-Fargo 10c
85 Yellow Jacket ...14⅝@14¾

AFTERNOON SESSION.

1435 Argenta ....95c@1
400 Addenda 40c
200 Albion 15c
270 Atlas 50c
30 Bulwer 11¼

Thursday A.M., Oct. 30.

220 Alta ....5⅝@5¾
480 Alpha 15
300 Andes ....1.15@1.20
165 Best & Belcher ..18⅝@18¾
255 Belcher 4.15
475 Bullion ....7¼@7½
245 Benton 3.65
400 Con Virginia 5½
202 California ....5@5¼
450 Chollar ....7⅝@7⅞
965 Con Imperial 1.10
120 Confidence ....11¼@11½
100 Crown Point 4¼
65 Caledonia ....2.30@2.35
470 Challenge ....3¼@3.20
500 C Dorado 2¾
820 Exchequer ....5½@6
100 Flowery 45c
440 Gould & Curry ....11@11½
1000 Golden Gate ....2@2¼
295 Hale & Nor ....15½@15¼
325 Justice ....3.05@3
100 Julia ....3.65@3.60
35 Kentuck 4
450 L Bryan 65c
820 Lady Wash ....1@1.05
350 Leviathan ....55@50c
575 Mexican ....37@38
660 Mackey ....30@25c
840 N Bonanza ....1.20@1.15
100 New York ....40@35c
30 Occidental ....2¼@2.40
255 Ophir ....34¼@33¾
200 Overman ....9¼@9½
720 Potosi ....5¾@6
190 Phil Sheridan ....40@50c
665 Savage ....15½@15¼
705 Sierra Nevada ....60½@60
295 Silver Hill ....1¼@1.20
1300 Succor ....40@30c
100 Senator 25c
850 Scorpion ....5¼@5¼
210 Utah ....22@21½
465 Union Con ....90½@89½
100 Woodville 35c
2740 Wells-Fargo ....10@15c
890 Ward 2½
575 Yellow Jacket ...17½@17¼

AFTERNOON SESSION.

300 Adenda 45c
1365 Argenta ....95c@1
1430 Belmont ....90c@1
90 Bodie ....13¼@13¼
840 Bechtel ....1.40@1.45
400 Black Hawk 75c
500 Boston ....1.40@1½
600 Big Prize 30c
100 Booker ....75@70c
1850 Belmont ....90@75c
1195 Belle Isle 4.30
70 C Pacific ....7¼@7⅞
250 Caledonia (B H) 2.10
2150 Champion ....15@25c
100 Caledonia (B H) 2¼
100 C Pacific ....7½@7¼
120 Dudley 1
670 Day ....75@70c
235 Eureka Con ....26½@26¼
75 Endowment 50c
260 Grand Prize ....2.40@2½
200 Goodshaw 35c
350 Gila 25c
100 Hillside 1.80
515 Independence ....1¾@1.70
580 Jupiter ....75@60c
240 Leopard 55c
40 Leeds 50c
1000 Martin White ...1.65@1½
50 Meadow Valley 30c
200 Metallic 75c
110 Mono 6½
100 Mt Diablo ....7@7¾
135 Mammoth 7¾
1800 N Noonday ....4@3¾
1450 N Belle Is 30c
345 Noonday ....3.95@3.70
90 Northern Belle 4¼
250 Navajo ....45@40c
2300 Oriental ....40@50c
1750 Paradise 1½
50 Queen Bee 15c
170 Raymond & Ely ..1.15@1¼
50 Star ....50@60c
550 S Bulwer ....35@40c
310 Syndicate 6½
160 Summit ....1.30@1.40
670 Tioga Con ....3.15@3.30
200 Tuscarora ....45@40c
790 Tiptop 1¼
100 Vortex 25c
450 Booker ....75@80c
100 Belvidere 60c
1120 Belle Isle ....4.85@4.95
295 Bechtel 1.35
600 Bodie ....14½@14¼
520 Boston ....1½@1.45
1100 Champion 20c
150 Con Pacific 7¾
500 Caledonia (B H) 1¾
1000 Day ....75@85c
50 D Standard 50c
50 Defiance 50c
850 Dudley ....1¼@1.30
200 Endowment 50c
210 Eureka Con ....26@26½
75 Goodshaw 30c
370 Grand Prize ...2.55@2.65
600 Hillside ....1.70@1.65
310 Jupiter ....2 30@2.40
200 Leeds 50c
230 M White 1¾
200 Mammoth 7
625 Metallic ....60@75c
1050 May Belle 25c
250 Mono 6½
650 Noonday ....4¼@4.40
1250 Navajo 50c
1250 N Noonday ....3.90@3.95
90 Northern Belle 5¾
500 N Belle Is 30c
450 Orient 35c
450 Paradise 1
450 Queen Bee ....30@35c
110 Real del Monte ....5@5¼
347 Raymond & E ...1.20@1¼
235 Silver King ....6⅞@6¾
200 Syndicate 6¼
480 S Bulwer ....30@35c
100 Star 45c
100 Tuscarora ....80@95c
140 Tiptop 1.30
930 Tioga Con ....3.40@3½
150 Vortex ....40@45c
50 Wales 7

Pacific Board—Latest Sales.

Wed'sday A.M., Oct. 29.

100 Alta 5¼
200 Andes 1.10
130 Alpha 13¾
300 Atlas 50c
200 Belcher 3.65
200 Benton 3½
50 Best & Belcher 18¼
25 Crown Point ....3⅝@3.65
40 California 5⅝
100 Challenge 2¼
60 Chollar ....6⅝@7
450 Colorado ....3½@4
30 Con Virginia 5½
100 Exchequer 4.85
90 Gould & Curry ....9⅝@10
60 Hale & Nor ....14¼@14⅝
150 Julia ....3.30@3.35
200 Justice 2.95
30 Kentuck 3.90
130 Mexican ....36@35¼
50 New York 35c
160 Ophir ....32¼@33
100 S Nevada ....58¼@57¾
160 Savage ....13¾@13½
20 Silver Hill 1.20
110 Union ....84½@85
50 Utah 21¼
480 Wells-Fargo 11c
100 Ward 2.35
200 Yellow Jacket ....15@15⅜

AFTERNOON SESSION.

50 Andes 1.10
20 Alpha 14½
50 Alta 5⅝
150 Bullion 7
100 Belcher 3.95
60 Best & Belcher ..18⅝@18½
30 Caledonia 2.40
5 California 5.35
25 Con Virginia ....5½@5⅝
100 Exchequer 5
45 Eureka Con 29
20 Gould & Curry ...10½@10¼
80 Julia 3½
60 Justice 2.95
250 Leopard 50c
20 Mexican ....36⅝@36½
500 Mackey 30c
190 Mono 6¾
100 M White 1.90
900 Oro ....1.20@1¼
30 Ophir ....33½@33¾
10 Overman 9¼
50 Savage 15¼
100 Scorpion ....5@5¼
20 Sierra Nevada 59¼
40 Uncle Sam 2.40
10 Union 86½
200 Wells-Fargo 10c
45 Yellow Jacket ...16¼@16¼

California Board—Latest Sales.

Wed'sday A.M., Oct. 29.			
350 Arcuta	1@1.05	20 Alta	5|@5|
550 Atlas	40@50c	200 Ætna	2c
30 Alta	5|@5|	200 Argenta	1
20 Alpha	1||	100 Atlanta	1c
700 Black Hawk	55@45c	200 Atlas	25@30c
100 Bullion	6|@6|	20 Best & Belcher	18|@18|
100 Best & Belcher	18	40 Bullion	6|
50 Caledonia	2|	150 Big Prize	30c
150 Challenge	2.30@2|	300 Black Hawk	55@47|c
20 Chollar	6|	20 California	5|
20 Crown Point	3.65	30 Con Virginia	5|
320 Con Imperial	1.05	200 Con Imperial	1.05
30 Con Virginia	5|@5|	40 Crown Point	3.65
40 California	5|	20 Chollar	7
40 Exchequer	4.90@4.95	40 Challenge	2|@2|
100 Globe	25c	40 Caledonia	2.30
30 Gould & Curry	9|@9|	40 Exchequer	4.90@5
80 Hale & Nor	13|@14	160 Enterprise	1|
35 Julia	3.35@3.30	30 Gould & Curry	10|@10|
40 Justice	2.80	500 Glynn Dale	8c
100 Mint	11c	10 Hale & Nor	14|
30 Mexican	35|@35|	10 Julia	3.45
40 Ophir	32|@32|	30 Mexican	36|@36|
40 Potosi	5|@5|	100 Newark	13c
10 Sierra Nevada	5|	20 Ophir	33|@33|
130 Silver Hill	t.20	40 Potosi	5|@5|
20 Savage	13@13|	20 Savage	14|@14|
30 Union Con	84|@80|	20 Sierra Nevada	59@58|
20 Yellow Jacket	15@15|	100 Trojan	11c
AFTERNOON SESSION.		20 Union Con	80@80|
30 Alpha	14@14|	20 Yellow Jacket	15|@15|

Mining Share Market.

We know from the daily papers that there is a Stock Exchange in this city, but outside of that means of information the fact would hardly be known to the uninterested public, for the reason that the business that has been done for the past week has been void of excitement. Whatever transactions have occurred have been in the quiet transfer of mining stocks upon their own merits as an investment, and not upon any demand for speculative purposes. The market may be termed sluggish, without a ripple of excitement. The rich developments in the Sierra Nevada have failed to bring about a "boom," which would have occurred in former times to such an extent as to be the ruination of many and the enrichment of a few. Many of the stocks have been up and down, in a small degree affording buyers an opportunity to make their daily stipend of profits, and preventing any great loss if caught on the down grade. Sierra Nevada does not seem to be considered in making calculations, while much is expected of Union Con. The Bodies opened steady, but declined one-half at the end of the week. The fluctuations have been constant, and at the close of our report left the favorite Comstocks on the rise with a feeling of strength. There are no prophets in the market, for the reason that the indications which generally foretell the condition of the business are either absent altogether, or are considered unreliable. We may safely assume, however, that the condition of the mining share market for the past few weeks is an indication of a calmer disposition in those whose occupation leads them stockward, and a desire to confine their attention to quick sales and small profits.

The New Water Pipe.

Mr. John P. Culver, civil and hydraulic engineer of this city, formerly chief engineer of various water works in the East, has for the past twelve years been perfecting a water pipe, based upon thin sheets of iron and asphalt. Notwithstanding repeated and discouraging failures in this country and abroad, the efforts of inventors have never relaxed, and entire success has at last been achieved, continued through a period of fifty years. Several years of trial at the East under pressure of 75 pounds to the square inch fully settles their value. These pipes are composed of alternate layers of thin sheets of wrought iron, coiled in convolute folds, cemented together by interfused asphaltum. They are wonderfully strong, durable and cheap. No coal tar is used in their manufacture. It is confidently predicted that this is the coming water pipe, and is certainly a long-needed improvement. The strength of these tubes is truly a matter of great surprise, in fact, wonderful, which, coupled with so many other advantages, that it seems a great stride in that branch of hydraulic engineering. The object long aimed at has been to preserve the iron from rust, and in this instance it is thoroughly accomplished. No rivets are used in the pipe, the bond of the asphaltum being greater than the tensile strength of the iron, a six-inch pipe made of two thicknesses of No. 28 iron withstanding ths great internal strain of over 300 pounds to the square inch, without rupture. Mr. Culver has taken out many patents to cover this invention, and there is no doubt but what he has accomplished a result creditable to himself, and meeting a need that cannot but make a great local, legitimate and beneficial enterprise. The pipes are soon to be manufactured here, and we shall treat at greater length on the subject hereafter.

It is now stated that Sitting Bull and his entire following, numbering 6,000 persons, are waiting for the Missouri to freeze over, in order to return to the American side of the border.

The body found lately on the shore of Lake Michigan has been identified as that of Burr, who accompanied Prof. Wise in the balloon Patbfinder.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

Amador Con.—*Ledger*, Oct. 25: Everything is moving along prosperously with this old mine of Sutter Creek. The large building over the new shaft is having the finishing touches put upon it. It is built in a substantial manner. A car track is also being laid from the new rock dump to the mouth. It is expected to have everything in shape for taking out rock early next spring.

Tibbetts Claim.—Allen Tibbetts, who owns this claim, which is located above the famous Mahoney, of Sutter Creek, has purchased a five-stamp mill, which he intends erecting on the claim. The mill was purchased in Volcano district. Tibbetts is at present engaged in tearing it down, and shipping it to Sutter Creek. Two men are also at work grading a site for the reception of the mill.

Mine Sold.—*Dispatch*, Oct. 25: The old Sorocco quartz mine, situated on Else creek, near Volcano was sold a few days ago, by G. W. Porter, to Cummings & Co., of San Francisco, for the sum of $10,000. We understand that the new owners intend to commence work immediately and thoroughly prospect the mine.

Items.—*Sentinel*, Oct. 29: The Downs mine, at Volcano, is still progressing finely. At a depth of 310 ft, 20 ft each way from the shaft, the ledge shows a width of four to five ft. Fine gouge is found on ths footwall, making it easy and cheap to sink and to take out ore. A rich body of ore has been struck in the Maryland, near Drytown.

CALAVERAS.

San Pedro.—Calaveras *Chronicle*, Oct. 25: Work on ths San Pedro, at Mosquito, is progressing steadily. The new shaft has been sunk to a depth of about 250 ft, and drifts are now being run to striks ths pay chimney.

The Duryea Hydraulic.—Piping is to be commenced in the Duryea hydraulic, Chils gulch, next Monday.

Big Blast in the Bonanza.—A blast of 050 pounds of powder was exploded in the Bonanza hydraulic, Moser & Co. owners, Monday afternoon last. A tunnel was run into the face of the bank a distance of 30 ft. From the inner end of the tunnel a lateral drift was run 15 or 20 ft, and then turning at right angles was run still further into the hill. The tunnel and drifts were then thoroughly and securely tamped and the powder exploded. We learn that ths blast did excellent work, shattering and pulverizing the gravel bank so that it can be readily piped. Everything is in readiness now at the Bonanza for turning on the water, and as soon as that important adjunct to mining can be obtained operations will be inaugurated.

Items.—Angels *Echo*: Bennett & Co. are now engaged in sinking a shaft on the Raspberry mine, with brilliant prospects ahead. They have sunk their shaft to a depth of 24 ft. The Raspberry claim is one of the best in this vicinity. The Fair Play mine is opened by two tunnels, the upper one nearly 200 ft and the lower one now about 300 ft, and both are connected by a winze. The mill in course of erection is to have 10 stamps, with new and complete amalgamating arrangements, and is situated at ths mouth of the lower tunnel.

EL DORADO.

German Mine.—*Mountain Democrat*, Oct. 25: The editor remarks that under ths thoroughly capable supervision of Mr. Baker, an experienced practical machinist, of San Francisco, who is the principal owner of ths mine, a substantial mill, hoisting works, etc., are in course of erection and nearly completed. Ths hoisting works are said to be the best in ths county, being run by water power, operating through one of Knight's improved wheels. From the hoisting works ths rock is run out 60 or 80 ft on a tramway, from the end of which there is a dumpags of 25 or 30 ft down to ths mill.

Lucky Prospectors.—Up near ths lins of ths ditch, far up ths mountain back of the German mine, Loafer's hollow, two prospectors were last Saturday getting from $2 to $3 to ths pan from a considerable deposit of ferruginous slate and decomposed quartz they had just opened up. About a mile thence, far up the mountain on the opposite side of ths hollow, Chass and others have sunk a shaft 15 or 20 ft through a similar deposit, from which thsy have taken ae high as $7 to the pan.

FRESNO.

Rich Strike.—The Fresno *Republican* says: In sinking the main shaft at the Hanover mine, a few days since, a rich vein of gold-bearing quartz was struck at a depth of 150 ft, 14 inches in thickness. Work has been pushed ahead in following the vein down, the quartz increasing in thickness and growing richer as depth is gained. At the present time they are down 187 ft, and the vein is over two ft in thickness, and the ore assays over $100 per ton. Steam hoisting works are to be erected at once. This mine is situated on the north side of the San Joaquin, about 30 miles from Fresno and one mile east of Fine Gold.

Quicksilver.—Fresno county, in addition to her valuable gold and silver mines in the Sierras, has a large territory in the Coast range that contains vast deposits of quicksilver ore. The New Idria quicksilver mine is situated in the last named locality, about 60 miles southwest of Fresno, and is one of the most valuable and productive in the world. Many other valuable quicksilver mines are located in the same vicinity, but they have not been worked to any great extent the past few years, owing to the extreme low price of quicksilver. Now, however, they will undoubtedly be started up again, as the present price will pay a handsome profit above the cost of production.

INYO.

Bishop Creek District.—*Independent*, Oct. 25: Thie district was recently formed from the Antelope. The western boundary was extended from a point on Owens river along the north line of the county in a westerly course to a point where the line intersects ths line of the Sierra Nevada district, thence southerly along the line of said district to the line of Cummings district; thence along the line of Cummings District in a southerly course to a point on Big Pine creek, to the southeast corner of Cummings district, thence along Big Pine creek in an easterly course to a point on Owens river opposite the mouth of Big Pins creek.

Panamint.—The Stedsfeldt furnace will not be put to uss yet awhile, the mill having plenty of free milling ore on hand to keep it busy for some time to come. Panamint now has a well-stocked store where all ordinary supplies can be obtained at reasonable rates.

New Mines.—The Indiana mins, owned by Messrs. Boley & Tuttle, near Swansea, is turning out some of the richest silver ore ever seen in California. Several assays made by Mr. Woodhull of ths last ore taken out averages 933.72 ounces per ton. Work is being prosecuted in following the vein in the tunnel, from which the ore is taken. The vein is perfect and continuous and is gradually widening. The tunnel is in nearly 200 ft. Messrs. Boley & Tuttle are also opening a new mine near the Indiana. They have a two-foot vein, the croppings of which assay 127 ounces in silver. On ths same belt, in a direct line with the Indiana north one and a half miles is ths Flagstaff mins having ore which assays 400 ounces in silver per ton.

MONO.

Maryland Con.—*News*, Oct. 26: The work of sinking the main shaft is progressing rapidly, and every effort is being put forth to attain depth. When the 250 level in the main shaft is reached, where a crosscut at the foot of the old incline has already been run, the company will resume the extraction of ore from the main ledge in ths north and south drifts; at the same timo sinking in the main shaft will be continued indefinitely.

Noonday.—The joint shaft is down 450 ft. Crosscut east from ths 300 level is in 146 ft; crosecut from same level west, in 115 ft. From the 300 station have drifted on vein No. 1, south, 50 ft; on the same vein north, 93 ft. Have drifted on vein No. 2, from 300 level, south, 36 ft; north on same vein and station, 23 ft. Vein No. 1 is about two ft in width, strong and well defined, and carries good milling ore. Vein No. 2 is about five ft wide, strong and regular. Quartz unmixed with porphyry and giving high assays. The vein cut from the 212 level is very large and strong, all ors assays from which average $30 per ton. This vein is from 5 to 10 ft wide. A drift has been run south on this vein from point of intersection 50 ft. Connection has been made from west crosscut on the 212 level with the Noonday drift from the 200 station. This gives a continuous line of drift on the Noonday ledge of about 500 ft.

Tioga.—Main shaft now down a depth of 645 ft. The Syndicate drift has been advanced to a length of 507 ft in most favorable ground. Have commenced a drift from the bottom of the Ralston winze, on the 020 level, and a west crosscut from same level has been advanced 18 ft toward No. 3 drift. East crosscut, same level, is now in 28 ft, and the ground looks decidedly favorable. Have completed winze from the 320 to the 520 level; the connection thereby made offering sufficient air to dispense plenty through the winze.

Bodie Tunnel.—Now in 1260 ft, the character of the ground being very favorable, with much iron-stained porphyry in the face. Are making from two and one-half to three ft per day, and everything looks remarkably well for the future of this property. Work will be resumed at the 900 station within a few days, when important developments may be looked for. Air in the tunnel continues good, and the men work with comfort in any portion of the property.

University.—Main shaft down 160 ft; formation at bottom hard, iron-stained porphyry, carrying clay seams with quartz. Timbering is going along as the shaft is sunk. Machinery and everything above ground is in first-class order and running well. Sinking will be continued without interruption until a sufficient depth has been reached, when crosscutting for the ledge will be begun.

South Noonday.—Shaft now down a depth of 48 ft; the formation, quartz mixed with clay and porphyry. Timbering in a substantial manner all the way from the surface. Late developments in the Noonday property are all pitching east and toward the South Noonday. A shaft house will be placed over the shaft at an early date.

South Hulwer.—Work on the north drift from winze No. 2, 350 level, is being carried along vigorously, and is now in a distance of 85 ft from the winze, holding its regular and well-defined course the entire distance. In the face of this drift the ledge is six ft wide, of good milling ore. Everything working in first-class shape and condition.

Red Cloud.—In ths south drift, on 250 level, have about four ft of low-grade ors, which will probably mill about $20 per ton. Are raising a chuts from thie drift, which is in 30 ft; have two and a half ft of ore. Are also making an upraise from the east lateral drift; have raised 20 ft and have two ft of good ore.

Addenda.—Since last report have added 25 ft to the 300 south drift; total distance in from incline, 145 ft. The west crosscut, at the 260 station, is now in 70 ft, face of crosscut in birdseye porphyry. The 300 drift is still in ledge formation. The mine is looking very well.

Mammoth.—Mammoth City *Herald*: The air compressor and drills are kept steadily at work in the lower and middle tunnels. Rock is being steadily shipped from ths mins to the mill, which is kept running night and day.

True Blue Tunnel.—Now in about 200 ft from the face, working altogether in vein matter and showing a near approach to the main ledge. The ground is working well, and the tunnel is being driven with all possible dispatch.

NEVADA.

Great Republic.—Grass Valley *Union*, Oct. 25: This quartz claim, located near the railroad at Kress' Summit is showing good prospects. An incline is down upon the ledge 85 ft, at which point it is tapped by a drain tunnel several hundred ft in length, which carries off ths surface water. A contract has recently been let to sink the incline below ths level of the tunnel, and ths ledge now shows in the shaft a width of three and a half ft, which prospects finely in free gold. Should the prospects continue as favorable as at present, ths mine will be put in regular working shape by the erection of steam hoisting works.

Washington Mine.—The work on the mine is prosecuted diligently. The new shaft is down 140 ft, and is carrying a ledge of from 12 to 18 inches of fine-looking quartz, containing considerable sulphurets. The ground is firm and the ledge solid. The stockholders of the company are in excellent spirits at the appearance of the mine, which they regard as giving most excellent promise for the future. The pumping rig on the mine is one of the best in the district, being a large water-wheel with ample power at all seasons of the year, which will furnish all necessary power required in pumping and hoisting.

Rocky Bar Mine.—The drift in this mine that was being run for a connection between the new shaft and the old Chavanne shaft has been completed. The drift was started from both shafts under the supposition that the ledge in both were the same, but it was demonstrated that they were separate ledges, and when the drifts were extended far enough toward each other a crosscut was run to connect them, and upon its completion it was shown that the two ledges are 60 ft apart, both being of good size and producing good pay ore. With thie connection made an important change in the working of the mine is contemplated, and instead of two sets of machinery being used to do the hoisting, one will be etopped and all the rock hoisted through the Chavanne. This will prove quite an item of saving in the monthly expenses of the mine. The drain drift from the bottom of the Chavanne shaft through to the New York Hill mine has yet about 80 ft to run, which will take from three to four weeks, when a perfect drainage will be secured for the mine to its present depth of working. The drifts that are now open give access to a large amount of ore, sufficient for one year's work without deeper sinking, and in the meantime the present drifts will be extended and a large body of undeveloped ground opened. There is but little water to be pumped now, and with tho drain drift there will be none at all. There are between 60 and 70 men engaged above and below ground, and this number will be increased during the winter. The mine presents a good appearance throughout, and promiece to be among the leading properties of the district.

East Orleans Claim.—The Nevada City *Transcript* says: The above claim is situated on the Live Yankee ledge, adjoining the old Orleans mine on the east. Messrs. Russell & Jamieson are the owners. They have run a tunnel into the sidehill a distance of 700 ft. The first chute was struck 300 ft from the mouth of the tunnel, but they pushed by it without taking out any of ths ors, and after going 400 ft more struck the chute they had started with the intention of developing. The ledge varies from 18 to 30 inches in thickness, showing about the former dimensions in the breast of the tunnel. It is very rich in sulphurets, some of the specimens being estimated as high as $300 per ton. This same chute formerly milled at the rate of $12 per ton in free gold near the surface, the amounts of rock taken from it there by different parties being so small that the sulphurets were not saved. There are five good chutes of ore on this one claim, and during the coming winter the owners propose to commence working it systematically. The Live Yankee ledge has been traced from Hearne's claim on Canada hill nearly westward for a distance of something like four miles, and developed in numerous places from one end to the other with gratifying results.

Cold Springs Gravel Mine.—*Transcript*, Oct. 29: Work on the Cold Springs gravel claim in Willow valley is being pushed ahead with a perseverance that can scarcely fail to bring success in the shape of finding the large and rich channel that the company have the best of reason for believing to be just ahead of them. Two shifts of men are working in the tunnel regularly, but the rock through which they must drive is so hard that the average distance per week advanced of late has been close to four and a half ft.

PLACER.

Dutch Flat.—*Forum*, Oct. 23: The miners in this vicinity are busily engaged in preparing for extensively working the various gravel and other claims the coming season. Probably no better prospects for a favorable season have existed for several years, and it is confidently believed that the coming season's work will mark an epoch in the history of our mines that will result in a large amount of treasure for the owners and an increased prosperity to all kinds of business.

SIERRA.

Air Shaft.—Downieville *Messenger*, Oct. 25: The parties who have the contract for raising the air shaft in the Highland Mary mine, at Wahoo, are pushing their work along rapidly, and expect to get through in a few wseke. They are up 150 ft now, with about as much more to raise.

Monster Nugget.—Nevada City *Transcript*, Oct. 29: Dr. Holdsworth, the veteran prospector of the mountains, was in town yesterday. He says that about two weeks ago, while working in his blue lead claim at Milton, Sierra county, he took out a nugget that tipped the scales of a Sierra City banker at over a pound and a quarter. There is not a bit of quartz in the mass, and he is going to keep it as a memento. It is the largest piece of gold he ever found in all his experience as a miner. It is worth $19.50 per ounce.

TRINITY.

Hostetter Gulch.—The Trinity *Journal* has information that rich prospects have been obtained from a recently discovered quartz lode on Hostetter gulch.

TUOLUMNE.

Piety Hill.—Sonora *Union-Democrat*: Monday morning ground was broken again on Piety hill, in front of E. A. Rodgers' residence, preparatory to going for the vein of quartz that is known to run from the Divoll, Clark and Bray bonanza in front of Rodgers' and back of Cady's house. We learn that parties back of Cady's house have dug and found the vein, other parties are at work below, near the Jewish cemetery, sinking for the vein. The Ferguson and Smith claim near the Divoll & Co., is a different vein overlying the Divoll about 25 ft. Work is kept up on it and some rich ore is obtained.

Groveland.—*Independent*, Oct. 25: A correspondent says: Our mining prospects seem to be brightening up wonderfully. The Mt. Jefferson company are still thundering away with their mill and have quartz enough in eight to last for many months. The Italian company, on Deer flat, will start their mill within two weeks, or as soon as the concentrator, now in process of erection, can be completed. They have several hundred tons of good paying ore on the dump, and plenty more in eight, handy to be got, and wood enough on hand to last six or nine months. The Spring mining company have out about 40 tons of ore, which they are hauling to Big Creek mill, and will commence crushing again this week if the water holds out. Dr. Austin has sold a mine, near Bower Cave, to a New York capitalist for $8,000, and the new owner is already at work upon it. Work is also being pushed ahead upon ths Bandereta by ite new owners, who recently purchased it for $80,000. The company that recently purchased the Captain Akin mine, near Coulterville, have now purchased a large mill in Hunter's valley, which they are moving over to their mine, and under the supervision of Mr. Piper, will soon have it in running order.

NEVADA.

WASHOE DISTRICT.

Ophir.—Our latest reports are as follows: Main incline has been sunk and timbered to a depth of 92 ft below the 2400 station, and continues in a favorable-looking vein material, showing streaks of clay and quartz. On ths 2400 level ths west crosscut has been advanced 20 ft, through a vein formation corresponding to that exposed in ths main incline at that point, and is now in 78 ft from ths east eide of ths incline.

Con. Virginia.—Ors to the amount of 1,134 tons has been extracted during the past week. Winze on 1500 level is down 45 ft passing through low-grade ore.

California.—On the 850 level the north drift has been advanced 29 ft, and is now in 100 ft, passing through a vein formation. At ths 2250 level in ths C and C shaft thsy are cutting out a station, from which a north drift will be run to intersect the ore vein found on ths 2150 level. The pumps continue to work well and handle the water with ease.

Union Shaft.—The shaft has now reached a point three ft below the Sierra Nevada 2300 level, and the station set in place. The bottom still shows streaks of good ore. Thsy have started a drift from this station to connect with the drift being run from the Sierra Nevada incline on their 2300 level.

Belcher.—The main incline has been sunk and timbered a distance of 13 ft, making its total depth 137 ft below the 2800 level. The bottom is still in hard ground. Ths south drift on ths 2700 level has been run and timbered 27 ft, making its total length 204 ft from the station.

Bullion.—The incline winze is in a total deptb of 200 ft. The material is a mixture of porphyry, clay and quartz of a very promising appearance. The water has retarded progress during the week, but has now decreased in flow, so that it is easily handled.

Sierra Nevada.—The water in the incline has been lowered below the 2400 level. The work of opening the station on thie level has been commenced. The progress will be very slow on account of the extreme heat, caused by the hot water flowing into the incline from different points between the 2300 and 2400 levels, and they not being able to make a sufficient supply of compressed air to do the requisite pumping, and at the same timo work rapidly. The east drift on the 2200 level has been advanced 29 ft; total distance, 186 ft. The face of this drift has become much softer since last report, and they have found it necessary to come back 20 ft from the face and timber the ground.

HOT CREEK DISTRICT.

Rich Strike.—The Tybo *Sun* of Oct. 25th says: A rich strike has been made in the old Dominion mine in Hot Creek district. The ore is of the same character as they formerly had in that mine—full of horn silver. The strike was made last Sunday, and it is showing up splendid as fast as it opened out. They have some 200 tons of ors on the dump that will assay from $60 to $2.50 per ton.

PARADISE DISTRICT.

Rich Ore.—The *Silver State* says: Gen. R. M. Clarke Called to-day on his return from the Paradise minee. He showed us a specimen of wire silver ors from the Bullion mine, much of which is pure silver, and excels in beauty and richness anything of the kind we have ever een from the mines in this or any part of the State.

MOUNT ROSE DISTRICT.

Items.—A correspondent of the *Reporter* says of the Rattler mine: The shaft is about 40 ft deep; then the tunnel runs north about 120 ft, following the ledge all the way. This ledge is from 6 to 20 inches wide, the quartz being of a dirty, greasy gray. Character of metals—native, horn, ruby and chloride of silver, milling $200 per ton. Cost of extraction, $20 per ton. The next mine visited was the Big Prize. Here I notice a shaft being sunk about 80 ft west of the tunnel, in very fine ore, and supposed to be the main ledge, while in the tunnel a shaft is being sunk on a two-ft vein of good ore—native, horn, and ruby being generally diffused through the ledge or vein. The ore is free milling, and when any has been milled, has ranged from $160 to $200 per ton. The next, above or north of this, is the Bullion, one of the finest prospects in the district. The ledge is very large, requiring but few men to break down ors enough for the company's mill. This mine has been, and is, yielding some of the richest ore I ever beheld. The Mount Rose company's mine is also yielding some magnificent ore. This company ie not trying to break down any ore, but simply driv-

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Man and the Anthropoid Apes.

We must confess that the treatment of this subject is approached with misgivings that perhaps we may he guilty of disrespect to the remote ancestors which modern scientific theories havs selected for us. Recent discoveries unearthed in Japan, which are claimed to slightly approach the "missing link" that once hridged over the gulf separating man from the apes, must be our excuse for presenting some ideas from Prof. Mivart in the London *Tablet*. When the gorilla was presented as our long-lost cousin, we did not feel particularly proud of the relationship, and our instincts strongly tempted us to try and disprove it altogether.

It was claimed that the gorilla possesses a special affinity to man, and if not our immediate ancestor, must at least be regarded as the chief visible bond hetween ourselves and the lower animals. A high honor for the gorilla, which we fear has never heen fully appreciated by him. It certainly has not hy his cousin, man. Whatever M. de Chaillu reported of his habits and tendencies was eagerly devoured, and even benevolent individuals formed plans for developing him into a memher of civilized society, and bestowing upon him the right of suffrage. The heau ideal of apes, he surpassed them all quite as much as man surpassed him. He was a vegetarian, so is man, a very creditable thing, and he showed his common sense by living in trees, which, considering the climate, was the best place to live in.

But the proud pre-eminence of the gorilla was disputed before long. Without any wish to derogate from his rightful claims, students of the ape trihe felt ohliged to take facts as they fonnd them. After close examination they could not pnt thsir hands upon their hearts and say that cousin gorilla does exhihit a greater numher of structural characters like those of man than any other species in existence. They could not affirm on their conscience that they discovered in him those anatomical peculiarities which have special hereditary significancs. Not even in extérnal appearance was he more like to man than others of the ape trihe, and in this respect the chimpanzee and the orang might disputs the palm with him successfully. Like all the apes and half-apes, he has the great toe prehensile, and quits unlike man's, which forms the fulcrum in standing or walking. Iu a variety of anatomical particulars the oraug, the Gibhons and the haboons agree with man more closely than does the gorilla. The Gibbon, again, is more human than the gorilla as to the preponderance of the skull's brain-case over ths hony face, and in this respect the smaller American monkeys have the advantage over the Gibhons, and the squirrel monkey over man himself. As to a chin, the feature is wanting in a gorilla, hut may be found somewhat developed in the siamang. Sometimes, as in the case of the slender littls lemur (loris) there is, where we should least expect it, an approximation to part of the human structure beyond any that the gorilla can show. Indeed, so far as the skeleton is concerned resemblance to man is shared in different and unequal degrees by various species of the ape tribe, and no one kind is unquestionably much more human than any of the other.

But if we extend the comparison further—if we follow Prof. Mivart in every step of his minute investigation of the resemblances between other memhers of the order Primates and man the highest of them all—if we compare not only the bony etructures, but the muscles, the brains, the nervons and other systems of the apes who bear respectively some faint likenesses of the human form and constitution, we shall he brought to the conclusion that *the* highly-favored ape from which man ought, so to speak, to have descended, must have had the voice of a long-armed ape, the beard and whiskers of a saki, the skull-dome of an American ape, the chin of a siamang, the wrist of the chimpanzee, the liver and stomach of the Gibbons, the ischium of a slender loris, and the blade-bone of a gorilla. In short, search as we may among the Primates, we fail to light upon the ape who is worthy to be regarded as the progenitor of man and who realizes in himself all that would he required to make him that "hairy quadruped, furnished with a tail and pointed ears, probably arboreal in its hahits," to which Mr. Darwin pointed when tracing the descent of our species in his work published in 1871.

Nor does the difficulty end with our race. As we cannot find an ape *homunculus* from whom the human species may he supposed to have descended, so neither could we discover the prohable ancestor of the orang or tarsier tribe. These animals have bodies quite as exceptional as ours. The little tarsier, indeed, is said to have even a more exceptional structure than man himself. And the peculiar forms of these animals show cross relations and complex dependencies of the most puzzling description. In whatsver direotion we might move, we should encounter a similar net-work of difficulties, if we endeavored to account for existing structures through the influence of inheritance and "natural selection."

Why may we not reject the principle of natural selection in the etruggle for existence as sufficient to account for the presence of man on the earth, endowed with the glorious attrihutes of reason, conscience and free will, and explain it on purely scientific and philosophio grounds? In recognizing evolution as one of the primary laws of organic life, may we not account for the production of new forms of animals and plants, hy special powers and tendencies in each organism, *aided by* natural selection and the survival of the fittest?

We do not by any means dispute ths possibility of new and definite species emerging, under definite conditions, from known forms in ths course of ages, hut hold, on the contrary, that analogy drawn from ths inorganic world is in favor of such latent potentialities. We admit the occasional appearance in organic structures of altogether new and ahnormal features, nor would we deny the strange and startling transformations among the lower animals which have heen observed of late years, such as the direct evolution of Rotifers and Nematoid worms, and mention as a fact, with which we have recently become acquainted, the sudden transformation of a large Mexican eft with external gills, called the Axolotl, into an animal not only of a different species hut of a different genus. In this transformation the whole structure, and even the arrangement of the teeth, becomes completely transformed without our being able to discover what are the conditions of this marvelous metamorphosis.

The teaching of nature in regard to the genesis of species seems to be that similarity of structure frequently arises without the forms which resemhle each other having any genetic affinity. It is rather to an internal cause—an innate tendency, an idiosyncrasy, a marvelous potentiality—than to surrounding conditions, that the origin of new specific forms is to be traced. The apes of the Old and New Worlds respectively appear to spring from different types, and what they have in common may be regarded as only parallel developments. Human beings, who in one organ or feature resemble one of the ape tribe, differ in other organs and features from others of the apes and half apes, the *Simiadæ* and the *Cebidæ*. It does not follow, therefore, that hecause we resemble this or that ape in this or that particular we therefore spring from one of his race, though "it is conceivable," as Professor Mivart has said, "that the physiological units of a living organism may he so influenced hy surrounding conditions (organic and other) that the accumnlation of these conditions may upset ths previous rhythm of such units, producing modifications in them—a fresh chord iu the harmony of nature—a new species!"

None of the gifts of man are found in the ape. Ages have not sufficed to develop in him the gift of speech, and perhaps no length of ages would or could develop it. It is mere irony to compare our bones and brains with thoss of haboons, when we have arts and sciences to show which seem to affiliats us to higher intelligences, such as many have called angels and gods. The surprising faculties which we possess seem not to be the result of our material organization, or of merely natural evolution, hut to have been divinely implanted, and to have contrihnted greatly to the production and perfecting of ths frame we tenant. It is impossible to deny that the body influences the formation of the mind, hut it is no less certain that ths mind in part modifies the body. "The organs of ths brain," says Dr. George Harris, "are molded and influenced in their growth by the soul;" and Sir Matthew Hale, in his "Origination of Mankind," remarks that the body could not be reduced into that orderly frame in which it is constituted without the plastic and formative power of the soul.

There is in our mental constitution an action, a re-action and an inter-action unknown to the gorilla or his fellows in the woods and trees. We differ, therefore, from them in kind and not only in degree. We are among them but not of them. They are not our ancestors and they cannot be our kinsfolk. We have alliances with them, no douht, in so far as we are organized structures; they have none with us in so far as we are rational, conscientious creatures, endowed with the gift of speech. We refuse to be presented in the court of nature as a relative of the gorilla or any of the apes. We are not anxious to diminish the gulf which separates us from the monkey tribe, either hy raising them nearer to ourselves or hy degrading our race nearer to a level with theirs. If the ascent of mankind from apes by a process of natural selection could be proved, we should be obliged by parity of reason to believe in the possibility of the inverse process of descent to the level of the heasts from whom we sprung; and the prospect of such a decline and degradation—even as remotely possible—is not one which we conld entertain either with pride or pleasure. Yet it is a hypothesis much more easily demonstrated than that of evolution.

Scientific Cooking Association.—In Berlin an association has been formed by housewives of the city. This society initiated last year various useful measures. Thus, it has opened a laboratory for examination of articles of food (now so much adulterated), as, also, of utensils used in cooking. It is directed by a qualified chemist. The nature and quality of the objects analyzed at the Central Bureau are thus guaranteed. The chemist gives the memhers of the society a course of lectures in practical chemistry, and a cookery school has also heen formed. Students are examined in the subjects of study; domestic servants who have remained a certain number of yeare (five) in one household (of a memher of the society) are awarded with prizes. Last year 36 were thus rewarded. Another part of the society's operations consists in procuring places and work for servants with its memhers.

Lexington Oil Belt—Santa Clara County.

A late number of the San Jose *Mercury* contains an account of the above oil belt, its developments and history. It says: So many rumors of hig things in oil have come to us from the Lexington oil region during the last 15 years, which afterwards proved to he largely of a fabulous character, that the puhlic had crystallized into a condition of chronic doubt concerning the possihility of a pay strike in that section. Although it has heen well known that oil existed here, yet but few people, especially after the first experiments at well-horing had heen made, had any faith in the ultimats value of tbe district for oil mining.

Many of our older residents will remember the oil spring in what is knowu as Moody's gnlch. This gulch is ahout two miles above Lexington, crossing the Santa Cruz road. The spring was located a few hundred yards above the road. Other and numerous indications of oil existed along a belt of country stretching across the hills and gulches in a southerly direction for a distance of five or six miles.

It was in 1865, we believe, whsn the first well, known as ths McLeran well, was sunk, in Moody's gnlch, near where once stood Moody's sawmills. This well was bored to the depth of some 400 or 500 fest, and a flow of about a barrel of oil a day procured. The well-horing tools were of a primitive order, and many difficulties were encountered from inexperiencs and imperfect machinery. Some of the principal tools were finally stuck in the well, where they remain to this day. A year later, over the summit, and about four miles from the McLeran well, the Fargo well was hored to the depth of ahout 400 feet, and ahout the same quantity of oil obtained as at the former. This was also ahandoned as of no particular value. The same year Messrs. Pulsifer & Gould hored a well on the Griswold place, some two miles back of Lexington, to tbe depth, we helieve, of ahout 500 feet. Thsy found some oil and a considerahle quantity of salt water. None of these wells were sunk deep enough. One or two other efforts were made at that time, and then the work was abandoned for 10 years, and until the organization of the Santa Clara Petroleum Co., when Col. Boyer took the matter in hand. With improved machinery and experienced assistants, the well, known as the Boysr well, was hored in the Moody gulch, to the depth of 940 feet.

At the depth of 700 feet a flow of from two to three barrels of oil was obtained, but no genuins oil rock was found, indicatiug that the well was at one side and near the true rock. For the past year this well has yielded aud continues to yield ahout the quantity of oil named.

About a year ago the company became involved in new complications. Boyer was sold out by the Sheriff and disappeared from the scens, and new men came to the front. Among these were Charlie Felton, a man of indomitahls pluck and a solid substratum of coin; and also R. C. McPherson, an experisnced oil man from the Pennsylvania oil district, who was subsequently foremost in developing the Los Angeles oil district. It is to the sound judgment and true grit of Mr. McPherson, more perhaps than to any other person that the company has been kept steadily to its work for the last year and a half. He hrought with him from Los Angeles some of his most experienced helpers, and imported from the East the hest well-boring machinery to be had, and has pressed the work steadily forward to the present time.

Commencing a new well ahout 150 feet above the Boyer well, at a depth of a little over 700 feet the drill, a few days ago, penetrated the true oil sand rock. The result was most astonishing. So powerful was the escaping gas that the oil was thrown to the hight of 100 feet, drenching the derrick and buildings, and flowing down the canyon. It is estimated that at least 100 barrels of oil was wasted hefore the well could be secured. Since then *she* (oil men always speak of a well as of the feminine gender, and often apply pet names to her), has acted like a "Little Daisy." The flow has heen fully 60 barrels per day, of the finest green oil, of from 46 to 47 standard gravity, while the standard of the best Pennsylvania wells is only 45 grade. As the hest evidence of the genuineness of this strike we may state that during the brief period it has heen in operation the company has shipped some 300 barrels of oil hy the Narrow Gauge railroad. The oil at present is piped down the gulch to the turnpike, and thence hauled to Alma station, about a mile distant. It is the intention soon to pipe it through to the railroad, and eventually, prohably, to San Jose.

About 200 feet up the gulch from the main well work is progressing for another well, and will be pushed forward speedily to completion. The company is also preparing to hore a well, over the range, on the Taylor place. Near tbe latter place work is progressing rapidly on what is known as the Whiteside well, unner the same company. The altitude here is about 300 feet above that of Moody gulch. The well is now down nearly 800 feet, and is in most encouraging rock. It is near here that the O. L. Crandell and Hy Morrill claim is located, one of the largest and most promising prospects in the oil helt. (And here we take pleasure in adding parenthetically that Mr. Crandell has stood in from the first, in the oil husiness, and never lost faith in the ultimate results. The prospect is now luminous that a rich reward will gladden the remaindsr of his days, which we hope may he many).

A numher of new rigs will be prepared as soon as practicahle, and in a short time from six to eight wells will he going down at once. In fact, the certain success already attained will so stimulate enterprise in this direction, that we may reasonahly expect the time is near at hand when our oil regions will swarm with husy lahorers, and millions he added to the wealth of our county and State.

Historical Sun-Darkenings.

The near approach of the total eclipse of the sun may afford cause for the selection of a short article on the above subject from the pen of J. R. Hind, in *Nature*. Mr. Hind says: In 536, 567 and 626 we find mention of long periods of diminished sunlight. Schnurrer records that in 733, a year after the Saracens had heen driven hack heyond the Pyrenees, consequent on their defeat at Tours, "the sun darkened in an alarming manner on August 19th; there appeared to be no eclipse by the moon, but rather an interruption from some meteoric substance." There was an eclipse of the sun, annular, hut nearly total, on ths morning of August 14th. It is mentioned in a Saxon chronicls, which tells ns "the sun's disk was like a black shield." The near coincidence of dates suggests in this case a connection hetween the darkness and ths eclipse. In 934, according to a Portuguese historian, the sun lost its ordinary light for several months, and this is followed hy the douhtful statement that an opening in the sky seemed to take place, with many flashes of lightning, and the full hlaze of sunshine was suddenly restored. In 1091, on September 29th, not 21st, as given in soms of the translations of Humboldt's "Cosmos," Schnurrer relates that thsrs was a darkening of the sun which lasted three hours, after which it had a peculiar color, which occasioned great alarm. In another place we read: "*Fuit eclipsis Solis II. Kal. Octob. fere tres horas: Sol circa meridiem dire nigrescebat.*" There was no visihle eclipse at this time, and the November eclipse was central only in the southern parts of ths earth. A century later, or in June, 1191, according to Schnurrer, the sun was again darkened, with certain attendant effects upon nature. Here ths cause is easily fouud; nn June 23d there was a total eclipse, in which the moon's shadow traversed the continent of Europe from Holland to ths Crimea; the eclipse was total in this country hetween the coasts of Cumherland and Yorkshire. Erman refers to a sun-darkening on February 12th, 1106, which was accompanied hy msteors, and we read in cometographies that on the 4th, or according to others, on the 5th of February, in that year, a star was seen, from the third to the ninth hour of the day, which was distant from the sun "only a foot and a half." Matthew Paris and Matthew of Westminster term this star a comet, and we may take it to have heen the same which, later in the same month, was observed in China under the sign Pisces, and which at one time was supposed to have been idsntical with the great comet of 1680. This body, however, would not appear to have heen sufficiently near the earth as, even on the assumption of a denser constitution than usual with comets, to account for a diminution of the solar raye hy its intervention. On the last day of February, 1206, according to a Spanish writer, there was complete darkness for six hours. In 1241, "five months after the Mongol battle of Leignitz," the sun was so obscured, and the darkness became so great, that the stars were seen at the ninth hour about Michaelmas. In this case, again, the darkness referred to was undoubtedly due to the total eclipse on Octoher 6th, of which Prof. Schiaparelli has collected a full account from the Italian writers. Lastly, in 1547, from April 23-25, Kepler relates on the authority of Gemma, "the snn appeared as though suffused with blood, and many stars were visihle at noonday." Schnurrer thought this phenomenon was what the Germans call a "Hohenrauch," notwithstanding the visibility of stars.

From the above brief summary of what have heen considered ahnormal sun-darkenings, we see that in several cases the diminution of light has heen due to the ordinary effects of a total eclipse, while it is clear that there are no grounds in the historical evidence for any prediction of a period of darkness. The nervous in these matters, and it would really appear that such exist, may take consolation therefrom.

Educational Cramming.—Prof. Huxley, speaking of the high pressure or "cramming" system in the schools, says that the children so taught are "conceited all the forenoon of life and stupid all its afternoon," and, also, that "their faculties are worn out hy the strain put upon their callow brains, and they are demoralized by worthless childish triumphs before the real work of life hegins. I have no compassion for sloth, but youth has more need for intellectual rest than age, and the cheerfulness, the tenacity of purpose, the power of work which make many a successful man what he is, must often be placed to the credit, not of his hours of industry, hut to that of his hours of idleness in boyhood."

Mr. S. H. Scudder's "Catalogue of Scientific Works" is now completed and has heen printed by the Directors of Harvard University Library. It is a book of 300 pages and 50 pages of index. The entries in this catalogue represent over 70,000 volumes.

The "Live Yankee" of Nevada County.

The Nevada City *Transcript*, speaking of the mining business of this county, alleges that about 20 quartz claims are now in successful operation in the district, all of which, as they attain depth, furnish new indications of permanency. The Live Yankee and Perseverance have recently added another big paying property to the list, which promises to be one of the best, if not the leading one, in the section. These locations are about one mile south of Nevada City, on the Half-Mile House road leading to Grass Valley, and near its junction with the Rough-and-Ready road. They are in slate formation, and in the same mineral belt as the Providence, Wyoming, Merrifield, Nevada City, Thomas and Pittsburg, lying near the center of the group. Some 20 years ago the surface over and near them was sluiced, and fortunes were made from the rich deposits of quartz gold. For some time as high as $300 per day for two men was taken out, and for months not less than $50. It being very evident that the gold came from some rich ledges near by, many shafts were sunk in searching for the fountain head. In time the Live Yankee was discovered. It being a blind ledge, or in other words not showing on the surface, and as no rich specimens were found at first, it was left idle for many years.

The Perseverance was prospected a little at different places on the surface, and was found to be a large formation. The fact that the gold in it was fine, as well as the quartz being considerably mixed with the slate, was very much against it at that early day. No depth was sunk, and it remained undisturbed, from the reason that early miners, as a rule, passed by all ledges that had been tried by those who went before them.

In March, 1877, the Live Yankee was located by C. W. Beedle, James Stevens and R. E. Robinson, although some of the same company had done a small amount of work on it previous to that time. Some very rich specimens were taken out by them and exhibited in town for several days. The dirt near the ledge was also very rich, some of it paying as high as $10 to the pan. The ledge was found to be from one to two feet wide, and some of the ore milled has paid over $100 per ton. The locators put up a windlass and sunk 40 feet, to water.

Shortly after the location of the Live Yankee, some quartz that showed considerable gold was found on the croppings of the Perseverance, and the ledge was located for 1,500 linear feet, the same distance as that on the Live Yankee. The latter ledge intersects the Perseverance at a point about 200 feet west of the Grass Valley road, and leaves it at an angle of 40°, running in an easterly direction. Between these two are three or more ledges. As the former were located with 300 feet of ground on either side of each, it included them, and they were all consolidated under the name of the Live Yankee mining company's claim.

The locators had worked the Perseverance to a depth of 40 or 45 feet, to water, taking out a quantity of ore which for the first 20 feet in depth paid $9 per ton, and below that $18.

In August, 1878, the property was bonded for the term of one year and two months to Fred. Jones, formerly of Grass Valley, who was so long identified with the Empire mining company, and was about one of the first engaged in quartz mining at that place. Pumping and hoisting machinery was placed on the mine by him, and a new shaft sunk for the purpose of testing the ledge below water level. At the depth of 93 feet drifts were run and considerable ore taken out and crushed. It showed free gold and great deal of sulphurets. The heavy sulphuret ore was worked separate at the Omaha mill for a test, and yielded 40% of sulphurets, paying $96 per ton. For the shafts and drifts to that depth the ore all averaged $34 per ton. At the depth of 123 feet, drifts were run, and considerable ore taken out and milled. The last 110 tons worked paid over $40 per ton, and yielded 15¼ tons of sulphurets.

It is acknowledged by the best miners that no mine opened here has shown such a fine quality of ore and so much of an improvement with the depth worked as this. The ledge in the bottom drifts varies from two to six feet in thickness and contains a large percentage of high-grade sulphurets. The locality and the advantages surrounding the property add value to it. Custom mills and sulphuret works are within 1,200 feet. It is less than one mile from the Narrow Gauge railroad depot, and less than half a mile from Town Talk station. The main-traveled stage road from Nevada City to Grass Valley crosses the ledge within 25 feet of the principal working shaft. The surface is quite smooth, and the ledge crosses 30 acres of thickly-timbered land belong to the same owners.

The V Flume Company's lumber and wood yard and office is but one-fourth of a mile distant on a raise of ground, making lumber, wood and water convenient at all seasons of the year. But one shaft is required to work all the ledges.

A few days since this property was sold by Mr. Jones to J. T. Bradley, Esq., of Oakland, who intends to shortly erect heavy pumping and hoisting machinery, and sink a deep, perpendicular three-compartment shaft. Cages and all other modern improvements are to be used, and the mine is to be worked on a very extensive scale. Mr. Jones, who has developed the mine thus far, will remain in charge.

Useful Information.

Toughened Glass.

A paper on the above subject was submitted to the Iron and Steel Institute at Liverpool, by Mr. Wood, in which it was stated that the glass is molded into various forms to suit the different requirements, the cooling of the glass being so regulated that the radiation from each point of the surface corresponds to the thickness of the glass, thus enabling the casting to be equally affected throughout when undergoing the tempering or hardening process. The regulation of the radiation or absorption of the heat in the thicker parts of the casting is effected by using iron hollow molds and by circulating cold water or cold air at those points where the glass is thickest, so that the casting cools equally in every part. The mode of toughening the glass is both curious and instructive, affording, as it does, a complete contrast to that of steel. The glass is heated to a high temperature, and then plunged into a bath of cold oil or other liquid, the result being that it becomes converted from its own characteristic brittleness to the remarkable tough fibrous material known as toughened or tempered glass. But to produce the desired effect and obtain the full advantages of the toughening process upon articles of great strength and thickness, Mr. Siemens found that the hardening or tempering could be effected in the molds themselves—first, by carefully protecting the glass from coming into direct contact with the mold, to prevent chilling the surface of the glass; and, secondly, by the use of hollow molds for maintaining a uniform temperature all over the casting during the hardening. The temper is modified in these thick castings by passing them through an annealing oven. The molds are chiefly protected by layers of wire gauze, perforated metal, or plaster of Paris, varying in layers or thickness according to the rapidity and energy required in tempering and the nature and composition of the glass, this energy being increased at the thick parts of the casting before alluded to by the circulation of cold water or air through the cast-iron hollow molds. So far as experience has shown, all kinds of glass are equally affected by the process. The time might come, Mr. Wood thought, when we should not only see glass sleepers, but glass tools and implements, eaves, troughing, spouting, furniture, and many other things. The average transverse resistance of the glass sleepers laid on the North Metropolitan trams was found, supported at 30 inches, to be about five tons.

[The increasing yield of petroleum oil on this coast will lead to the production of large supplies of paraffine, one of the products of petroleum, and in connection with the use of toughened glass, it may be well to say that this paraffine, when freed from the concomitant acids of refining, possesses a greater tensile strength than ordinary glass. Hence there is room for experiment in the way of hardening it, the ease with which it can be manipulated being in its favor.—Eds. Press.]

Mineral Soap.—About three years ago there was discovered, near Elko, a deposit of a peculiar character, which upon being tested proved to possess remarkable detersive qualities. Analysis of the material showed that it was composed of many of the constituents used in the manufacture of the soap of commerce. Within the past six months the "soap mine" has been worked by an incorporated company and the product utilized in the manufacture of mercantile soap. We yesterday received a call from E. A. Littlefield, of the Elko *Post*, who left some samples of this useful article, which proves upon test to be all that the manufacturers claim for it. The company are now making and shipping from Elko about a ton of soap per day, but this will be increased to ten tons within a few weeks. Its cost is about the same as that of inferior brands of soap, which it will supersede in due course of time.—*Nevada State Journal.*

Indian Steel.—The remarkable metal known as Wootz, or Indian steel, is now imitated with considerable success in some of the workshops of Europe, the process being as follows: Small pieces of very good forged iron or steel are put in a crucible and covered with charcoal; air is carefully excluded, and the mass exposed to heat until it turns dark gray—carburet of iron; this is easily pulverized, and in this state it is mixed with alumina and subjected for a long time to a white heat in a crucible, when it becomes white and brittle. If ⅛ to 1-12 of this white mixture is melted with some good steel, a very good imitation of Indian steel is said to be the result. Commercially speaking, the genuine raw steel, or wootz, comes in three forms, namely, in bullet-shaped pieces of a certain weight as they cool in the pots, and which comes from Calcutta; in cakes of 2½ pounds, from Bombay; and in cylindrical rods of about the same weight, from Golconda.

Artificial Asphalt.—*Dingler's Journal* says V. L. Dagusan heats cold tar in a boiler until all the water is evaporated, then adds finely pulverized marble, or limestone that has previously been burned, stirring in 5% of iron oxide, silicate of potash, and gypsum, mixing the whole thoroughly.

Luminous Powders.—Two patents have been recently taken out in England for phosphorescent powders. One of the patentees states, in his specification, that his object is to obtain and utilize at night-time the light absorbed during the daytime from sunlight or an artificial light, either by employing the powders after exposure, or by augmenting their brilliancy by means of electricity. The powders are made by taking 100 parts by weight of carbonate of lime, and phosphate of lime produced by the calcination of sea shells; secondly, 100 parts of lime rendered chemically pure by calcination, and after the above are mixed, 25 parts of calcined sea salt are added, then 25% to 50% of the whole mass of sulphur incorporated therewith by sublimation, 3% to 7% of coloring matter in a powdered form composed of mono-sulphuret of calcium, barium, strontium, uranium, magnesium, aluminum, or other minerals or substances, producing the same appearances, *i. e.*, which become luminous in the dark. The other patentee says of his phosphorescent substance, that he prefers calcined oyster shells combined with sulphur by exposure to sufficient heat, or a paste formed of neutral arseniate of baryta and gum tragacanth or sulphide of strontia, or sulphide of barium in combination with a small percentage of magnesia. For rendering walls or surfaces for advertising or other purposes luminous in the dark, they are coated with an adhesive substance. The phosphorescent substance is then spread over the surface, and then coated with transparent varnish or other transparent substance.—*Scientific American.*

Preservative Wrapping and Packing Paper.—Mr. John F. Rodgers, of Philadelphia, has patented a preservative wrapping and packing paper, for protecting cloths, furs, etc., from mildew and ravages of moths and other insects. The paper used is made from woolen and cotton rags and manila rope or manila paper. This paper is saturated with a mixture of 70 parts, by measure, of the oil remaining from the distillation of coal-tar naphtha by live steam with 5 parts crude carbolic acid containing at least 50% of phenola, 20 parts of thin coal tar heated to about 160° F., and 5 parts of refined petroleum. After saturation, the paper is passed through squeezers and over hot rollers for the purpose of drying. When cool, it is cut into sheets as desired, and the drying completed in the atmosphere. The paper thus treated is used for packing woolen clothing, cloths, furs, carpets, and all material likely to be injured by moths, mice, or vermin, and will also to a great extent, it is claimed, prevent cotton material from mildew.

To make Holes in Hard Steel.—Holes can be made in hard steel by the application of nitric acid. True, they will not be very perfect, but cases may occur where such an operation will be very convenient. The process is as follows: Cover the steel plate, where you wish the hole, with a thick layer of melted wax; when cold, make a hole in the wax of the size you want the hole in the plate, then put on one or more drops of strong nitric acid, leave it on for some time, wash off with water, and if not eaten through apply other drops of the same liquid, and continue this until the plate is perforated.

Good Health.

Sleep.

In a work on "Sleep and Sleeplessness," by J. M. Granville, it is claimed that sleep is a rythmical function of life. It is performed by the nervous system, either through a single center or by the several centers connected with various parts or organs of the body, from the supreme cerebral centers which control the immediate apparatus of intentional thought to the ganglia that regulate the work of the viscera. I believe the sympathetic system plays a conspicuous part in the production of the phenomenon, and this is why the due performance of the function is so readily prevented as it is by disorderly action in almost any part of the body, even when there is no sensation of pain or of uneasiness at the seat of the disturbance. People who do not sleep well and regularly are peculiarly liable to functional disorders; and, conversely, those who are subject to the anomalous maladies and symptoms too often set down to fancy, but actually existing and traceable with care to some special ganglion of the sympathetic system (for example, uneasiness in the "pit of the stomach," or aching pain in the lower lumbar region of the spine) are disturbed or disorderly sleepers. Sleep is a nerve state, whether the part sleeping be the brain or certain parts of the organ, the muscular system or viscera. The modifications which take place in the vessel supplying the organ or system that sleeps are the effects or consequences, instead of the causes of its condition.

The author devotes a chapter to the subject of going to sleep, and considers here the use of narcotics for the purpose of inducing it, observing that "the state they produce is not sleep, but a condition of narcotism that counterfeits sleep," adding, "When a man says, 'I want a quiet night; I cannot obtain it by going to sleep, or I am afraid to trust to the chances of natural rest, so I will poison myself a little, just enough to make me unconscious or slightly paralyze my nerve centers, not enough to kill.' If this fact should be kept clearly before the mind, the reckless use of drugs which produce a state that mocks sleep, would be limited." The state of inaction which is brought about by natural sleep is very different from that which is produced by paralysis of any degree. The following remarks are important:

Habit greatly helps the performance of the initial act, and the cultivation of a habit of going to sleep in a particular way, at a particular time, will do more to procure regular and healthy sleep than any other artifice. The formation of the habit is, in fact, the creation or development of a special center, or combination, in the nervous system, which will henceforward produce sleep as a natural rythmical process. If this were more generally recognized, persons who suffer from sleeplessness of the sort which consists in simply being "unable to go to sleep," would set themselves resolutely to form such a habit. It is necessary that the training should be explicit, and include attention to details. It is not very important what a person does with the intention of going to sleep, but he should do precisely the same thing, in the same way, at the same time and under as nearly as possible the same conditions, night after night for a considerable period, say three or four weeks at least. The result will amply reward the effort.

Anti-fat Mineral Water.—While surveying in the mountains northeast of Anaheim last year, Major Wm. P. Reynolds encountered a man who had worked for him in former years. He failed to recognize him, however, until the stranger explained who he was. It was no wonder the Major failed to identify his old acquaintance, for he was now a man of about 200 pounds weight, whereas he weighed 340 pounds when in the Major's employ. The secret of his reduced avoirdupois was freely given. A short distance up the mountain from where his house stood was a spring, the waters of which contained some mineral anti-fat. Did the Major want to lose some of the superfluous flesh which encumbered him? He did; he drank the water, and in 10 days his weight had been reduced 25 pounds. He continued drinking the water, until from weighing 212 pounds, he was reduced to 170 pounds, his present weight. This was accomplished without any violent action on the part of the water; it seemed to go about its business quietly and efficaciously. Major Reynolds will obtain water from the spring, and he will forward it to the Smithsonian Institute at Washington for analysis. The spring is about 16 miles from Anaheim, easily accessible, and if analysis establishes the fact that there is nothing to be apprehended from using the water, there will be numerous obese persons avail themselves of the opportunity to try nature's remedy. There is still another spring in the mountains possessing qualities as peculiar as the one mentioned. It was discovered one hot day by a couple of young men from Anaheim, who were on a prospecting tour. The water from the spring had flowed into a kind of natural reservoir, and it looked so cool and inviting that the young men doffed their clothes and took a bath. A few minutes after they came out their skin and hair took a reddish tinge, and they became like unto the aboriginal red men. It gradually wore off, however, and in a few days their color was a natural dirty brown.—*Anaheim Gazette.*

Cause of Stammering.—M. Chervin has of late drawn attention to the frequency of stammering in the south of France, where from 12 to 13 cases are noted for every 1,000, while in the eastern departments the proportion is only 1 for every 1,000. It has been assumed that the defect was in many cases simulated to avoid the conscription, but according to Abbe Petitot there are two districts in the Bouches-du-Rhone where all the inhabitants (15,000), stammer. This he ascribes to long-continued intermarriages among the communities, and to a consequent degeneracy of the race; and M. Chervin is of opinion that meningitis, induced by the great solar heat, which occasions so high an infantile mortality in this region, may possibly, when not fatal, leave an exceptionally great tendency to stammer.

Antiseptic for Infectious Diseases.—Prof. Klebs, of Prague, announces that the benzoate of soda is the best antiseptic in all infectious diseases. It acts, as the experiments of the author show, very powerfully. It is claimed that a daily dose of from 30 to 50 grammes to a full-grown man will render the poison of diphtheria inoperative. The benzoate is prepared by dissolving crystallized benzoic acid in water, neutralizing at a slight heat with a solution of caustic soda, drying and then allowing the solution to crystallize over sulphuric acid under a bell-glass. Large doses do not appear to be absolutely necessary. Good results may be obtained by the daily administration of about 12 grammes.

Nasal Respiration and Hearing.—The influence of nasal respiration on the ear is illustrated by Mr. George Catlin in his history of "The North American Indians." Among 2,000,000 Indians he found not one who was deaf or breathed through the mouth, except three or four deaf mutes; and in the memory of the chiefs of 150 tribes not one case of deafness could be remembered to have occurred. This is explained by the mother always closing the mouth of the child whenever it attempted to breathe through it.

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The Week.

The elements of prosperity evidenced in the continued and steady increase of prices of iron, lead and quicksilver, and the firing up of heretofore silent furnaces in the East, indicate a return of better times, not only to the East but to this coast. The events of the week are not of any startling magnitude. The sounds of preparations for a period of activity during the coming winter are heard in every town and hamlet on this coast, and, in fact, in the whole Rocky Mountain region. Men are already talking about what they intend to do, what improvements they are about to make, and the look of care and evil anticipation has evaporated, giving place to the smile of pleasant anticipations. The prospectors are still busy, coming in with their usual "specimens" from new finds, as our Mining Summary will show.

The Indian troubles of Colorado and New Mexico, if not entirely settled, have at least lost their paralyzing features of war and blood. The feeling of safety has infused new life into the veins of the miners in the savage-infested regions, and all are preparing for a successful development of mines.

The Land Commission is bringing out a variety of opinions as to the changes that should be made in the mining law, and surely it seems as if the opinions of those who have had long experience in the needs of a mining community, would prevail over the interested ones of selfishness and avarice.

The unfortunate occurrence of the week was the disastrous fire at Colfax, on last Tuesday, in which a large portion of the town was laid in ashes. The loss is estimated at about $75,000. The people of Colfax have the sympathies of all for their affliction, which is all the heavier as it comes at the beginning of what is prophesied will be a hard winter, so far as temperature is concerned.

Taking the events of the week together, we may say that good influences are prevailing, and that it will be our pleasant task to record greater prosperity a week hence.

The Government and the Miner.

The advent of Mr. King upon the Comstock, and the announcement that the study of our great mining districts is to be resumed, and now carried out on a scale much more comprehensive than ever before, is a circumstance of the first importance to every man engaged in the metallic industries. There is no doubt that the Government can do much to foster any enterprise by undertaking to publish, for the benefit of all, the facts that are usually hidden in the knowledge of a few successful men. But in undertaking this work, for the benefit of the miner, the Government is often severely criticised.

What has the Government to do with private mines? is the question. But it is too late to ask it. For many years the agricultural interests and the fishery interests of the country have been carefully looked after by the general Government, and at a cost which is far in excess of anything that the important mining industry has had expended upon it. We have just risen from the payment of five and a half million dollars for the privilege of fishing in Canadian waters, when we could buy the fish much more cheaply. Every day we use manufactured articles which we are able to make, because this Government has been committed for half a century to a policy of protecting the constructive industries of the country. With such examples before us it is evidently long past the time when an inquiry of what business the Government has in private matters can have any force. A settled policy, and a wise one, of doing for each great department of labor that which can be done without furthering individual monopolies, has long ruled our country, and the mining men are entitled to their share of its benefits.

Before the war the Government engaged in the work of prospecting the ground for a transcontinental railway, and when the enterprise was finally undertaken, by private parties, the fruits of this great work obtained by repeated expeditions at immense cost, were not only turned over to the promoters but where not even reckoned among the gifts. They were looked upon as common property which any one could take. After the war the system of public surveys grew to a wonderful extent and included a careful and costly study of the geological formation, the beasts, birds, plants and bugs of the great West. Several surveying parties followed out this work on parallel lines, producing rivalry, confusion and repetition. The field they operated in had two great industries—mining and agriculture. One of them was already carefully fostered by an important branch of the Government service, but the other had been and continued to be treated with neglect. For fifteen years surveying parties have roamed over our mountains covered with men who are laboring to develop the mines, and who sorely need all the help they can get, but with two exceptions this immense activity in the cause of science, costing the people in some years nearly a million dollars, has never done anything for the miner. The Fortieth Parallel Survey produced the most important contribution to mining industry ever made in America, and in 1877 Lieut. Wheeler, then in charge of the surveys west of the one hundredth meridian, prepared for a similar work, by sending Prof. Church to the Comstock to continue the exploration of that important example of American lodes. With those two exceptions the costly surveying parties have seldom risen above puerility in their treatment of the most important scientific and practical question in their field of action.

This state of things now promises to come to an end, for we believe that Mr. King owes his appointment as Director of the scientific surveys to the certainty that he would give the mines their due attention. With the able men his corps contains, there is no doubt that at length the important and obscure problems of vein geology will receive some explanation. Mining has continued in some form, and even in a highly advanced state, for centuries, and yet the character and structure of veins are still mysteries.

This state of things cannot continue in the face of observation and publication. It is publicity and discussion that has raised metallurgy from its degraded condition of half a century ago to its present strong and thriving state, and the work done on our mineral veins will be felt in the furthest corners of the earth. Our mining field is peculiarly well fitted for the work. Out of all the blunders that have obscured the study of veins, the fact that they have, or that a large class of them have, intimate relations with the occurrence of erupted rocks, stands clear and strong and gains positiveness constantly. Our country contains the greatest extent of igneous rocks known in the world, and in the multiplicity of examples that are offered it is almost certain that important laws may be discerned.

The work of King, Hague and Emmons on the Fortieth Parallel Survey, and the work of Church on the Comstock, now just appearing, are forerunners of a series of which the best hopes may be cherished, both for American miners and for the world of science.

THE Cabinet at Washington have decided that the War Department shall deal directly with the refractory Utes.

Light and Heat of the Sun.

It is very singular that modern science should be guilty of inconsistencies in relation to the connection between the geological structure of the earth and the influence thereon of the solar light and heat. In the great anxiety to dispute the Mosaic account of creation, it has been demonstrated, on the one hand, that it would require 20,000,000 years to bring about the present structural features of the earth, and that during that period the sun had been assisting in the formation by the exercise of its powerful influence. On the other hand, it was demonstrated that the sun was an enormous incandescent body, requiring an inconceivable amount of fuel to keep up its heat and light. There was no conspiracy of opinion upon these two points, no comparison of notes. Observations proceeded until infinity has been reached, to-wit, an eternity of geological strata in the earth, and an infinite perpetual combustion occurring in the sun, so intense, indeed, that if the earth were to be suddenly cast into it, the effect would be less than if a single drop of water were thrown into a blast furnace.

Having disposed of the Mosaic theory, one of the questions now put to science is: "Whence does the sun, if incandescent, derive its supply of fuel?" The ever-ready reply is, "dead planets, comets, meteors." Without wishing to be impertinent, we would suggest that, if this combustion of dead planets, etc., has been going on for so many millions of years, and is still going on, why has not the supply given out, or why can not astronomers see this rush of bodies into the sun?

The sun of our system, without mentioning the multitude of suns of other systems, has certainly had time and opportunity to consume everything within its limits, from Mercury to Neptune. Yet there is no diminution of the body of the sun, and, consequently, no diminution of the fuel supply. If we agree that the sun is fed with meteors, etc., we must, in accordance with its immense requirements, provide such a shower of bodies upon it as would obscure our vision of space. A small annual fall of meteors cannot keep up the enormous combustion demonstrated to exist in the sun. It is claimed that the bodies injected into the sun are invisible, principally because they are not hot enough to be seen. But the moon is a dead-cold planet, perfectly visible by reason of its reflected light, and why should not the solar fuel flying through space be visible for the same reason? If the cosmical substances flying through space are too small individually to reflect light, the enormous aggregate should certainly present at least a nebulous appearance. This problem of solar heat and light is not a satisfactory one to solve. According to Dr. Henry Raymond, there are at the present time four different explanations of the production of sun light and sun heat, viz.: (1.) Combustion of cosmical substances falling into sun; (2.) arrest of motion of such cosmical substances; (3.) contraction of the solar mass; (4.) dissociation of compound bodies in sun's substance. He holds that the first hypothesis, that of "combustion," is virtually given up by scientists on account of its insuperable difficulties. The fuel problem is too intricate for the finite mind. The second, the so-called mechanical hypothesis, is held in greatest favor by scientists to-day, as best accounting for the phenomena, or as being least vulnerable to objections. This hypothesis presupposes the presence in space of an incalculable supply of ponderous masses, all roving loosely and by chance until, falling under the influence of the sun, they are drawn thereto with such momentum that the concussion gives rise to inconceivable light and heat. But Dr. Rogers believes that such existence of ponderable matter, away from the influences of gravity, moving about in the universe, and assumed to follow the attraction of the nearest stellar system, can hardly be credited by philosophic minds. The supposition that old, useless worlds, comets, meteors, etc., are attracted to the sun to be utilized for the production of its light and heat, is contrary to every principle of reason and sound philosophy. The inevitable enlargement of the sun's dimensions, which would occur from the accretions resulting from this method, would also prove fatal to this hypothesis. An exact knowledge of the sun for centuries has not in the slightest degree disclosed a change of radius in the earth's orbit—a necessary consequence of any change in the sun's bulk. The third hypothesis, "the contraction of the solar mass," implying a progressive diminution of that body, finds the same objections which lie against its progressive augmentation. The fourth, "the dissociation of compound bodies in the sun's substance," depends upon the process of combustion, and is, therefore, open to the objections already mentioned. Each of the foregoing hypotheses stands in direct opposition to the inexorable law of conservation of force. According to the decree of that law, whatever is received by the earth from the sun, an equivalent for the same must again be returned from the earth to the sun to the uttermost fraction. No hypothesis based upon any other foundation can stand. Dr. Roger's theory of the cause of solar light is a magnetic one. He believes that the sun and earth are gigantic fountains of magnetic influence, continually acting and reacting upon each other, and that this view gives to the phenomena of light and heat their clearest and fullest interpretations.

Prof. Benjamin Peirce, of Cambridge, venerable in years and profound in research, supposes that the solar system is surrounded by meteors so numerous that their total weight exceeds by 100 or 1,000 times the mass of the sun. Being dark, they are invisible, but we may suppose them to form an irregular envelope or series of envelopes; since we find such a constitution frequent in the stellar nebulæ, in which countless minor masses surround glowing centers of attraction. He also says: The assumption of the extreme cold of space, though based on a mathematical theorem with some claims to probability, is not impregnable; and if we admit that the meteors have some heat when they start on their way to the sun, the estimate of their product in heat on arrival must be increased. The great jets of glowing hydrogen gas which Prof. Young has so faithfully observed issuing from the sun's surface to enormous heights, can scarcely be accounted for on any theory of mere condensations in the solar mass. They are great outbursts, such as might result on a smaller scale from violent explosions; they fly outward with enormous velocity; they arise from the vast chasms of sun-spots. It is not difficult to believe that they are the upward splash when some great meteor dashes downward into the gaseous body of the sun.

To still further provide for the theory of a meteoric envelope, Prof. Peirce claims that these meteors are not hot enough to be visible, even if they were of sufficient size. Yet he argues that they have some heat when they start on their way to the sun, and increase that heat in space, which, he says, need not be extremely cold. If this be true, then they must become hot enough to be visible if of proper size, and that they are large enough is plain from the assertion that the hydrogen jets which issue from the sun's surface to the hight of 150,000 miles, are caused by the splash of some great meteor into the gaseous body of the sun.

But all this is sheer supposition, and may be declared improbable from the fact that the enormous quantity of matter in the shape of meteors, required to feed the sun, could not be in motion without being visible. The few meteoric showers annually observed are nothing in quantity. Again, if it be true, as Prof. Peirce alleges, that the space outside the solar system is largely tenanted by viewless meteors, which form the chief supply of the sun, what power compels them to seek the sun as a combustive center? If it be the attraction of the sun, why, then, does this attraction exercise an influence upon one meteor and not upon all? The truth is, if the power of the sun attracted one meteor it would all, and the result would be to increase the bulk of the sun 100 or 1,000 times, for he says this meteoric matter is that much greater than the mass of the sun; and if there be any power of attraction which regulates the descent of these bodies upon the sun, it must possess a greater power than the sun, and hence would draw the meteors into its own constitution and away from the sun. It would require an unnecessary stretch of the imagination to consider the confines of the solar system to consist of an envelope of meteors, each one awaiting its turn to be precipitated into the sun—an envelope of inert matter, movable only in one direction, viz: toward the sun, and then only at stated intervals. Such a mass of developed matter, remaining immovably fixed in space, would suggest the idea that perhaps the Hindoo cosmogony of Vishnu seated upon a turtle and holding up the earth might not be wholly erroneous. It is true that there exists in space uniformed matter as great in quantity as the immensity of space is infinite; but the formation of meteors, as needed for the sun's combustion, would be at the expense of this matter, and the rushing together of the particles toward and around the nucleus of every meteor would be attended with heat and light, the latter of which would be visible to the naked eye, and a tremendous apparition through a telescope—a condition of things which does not exist so far as present human experience is concerned. It would seem possible to explain the mystery of the sun as a source of light and heat by a more comprehensive system and one more in accordance with the logical conceptions of the stability of the universe; but we reserve further remarks upon the subject for our next issue.

WE DON'T KNOW.—An exchange having its headquarters in the carbonate belt of Colorado proposes a conundrum which we give up. It says: "If I am using my muscle and small capital in sinking a shaft, say two feet a day, in hope of striking mineral, why should Mr. Longpurse be permitted to come along with his bank account, and, putting in two or three shifts, run a hole down within 50 feet of me at the rate of 10 feet to my one, and on striking mineral before me, proceed to survey in my little patch of ground, shaft and all?" The fate of the prospector seems to be that of every man who is struggling for existence, namely, inability to realize any benefits from the results of his weary toil. Pioneers leave a name behind them, and are cited as examples of self-sacrifice, etc., etc.; but so far as legal protection of their rights is concerned, there seems to be room for substantial changes in the law.

A FIFTY-FOOT vein of cinnabar is reported discovered in Fremont county, Colorado. This is the first quicksilver discovered in that State.

Prof. Church on the Comstock Lode.

[Continued from Page 273.]

it. He claims that this discovery is of great importance, for it can prevent useless expenditure in prospecting the flat parts of the ground where ore never has been found, and in this way reduce the costs of exploration.

The fact that ore occurs only in the steep parts of the lode is explained by the supposition that the hanging wall has moved on the foot wall, and this was occasioned, according to our author, by the eruption of trachyte which loaded the hanging wall with so great a weight as to press it down. In this movement the flat parts of the lode would be pressed more strongly together, and it is a curious fact that the well-known hardness of the barren quartz which occupies these flat portions receives an explanation in this theory. It has been pressed to a firm mass. In fact through all the work the author's effort has been to weave the observed effects together so as to form their own theory. While the flat portions would be pressed together, the seams of the steeper parts would be opened and new depositions of quartz would be formed by substitution.

The quartz bodies lying in this highly inclined position contain paying ore, while those on the flat dips do not, though they sometimes hold a little gold and silver. On this account Prof. Church divides the filling of the Comstock in two periods, the siliceous and the metalliferous. The first followed the andesite and the second followed the trachyte.

If this discovery is sustained both in the Comstock and in other lodes formed in a similar way, it will have great importance as affording a clue to the date at which the silver ores of the Pacific slope were deposited. Hitherto nothing has been known on this point. The rocks which enclose them are of various ages, and all that can be said of the date at which they were impregnated is that it may have been quite recent for all of the formations, for there is no reason to suppose that it was contemporaneous with the rocks that hold the deposits. Some curious facts and speculations are given upon the origin of vein quartz, and the certainty that if it all came at one time and in solution, there must have been vast floods of water, and of metalliferous water, poured out at the time in question.

It is gratifying to find that a careful explorer rises from the examination of our greatest metallic lode, with the most hopeful views of its future. At present there is a most unmistakable impression abroad that the Comstock is practically exhausted, but Prof. Church seems to have become a geological "bull" on the prospects of the lode. Take, for instance, some of the impressions he received, as follows:

That the origin of the ore is as deep as the origin of the eruptive rocks andesite and trachyte, or many thousand feet below the present depth of the mines.

That there is no good reason known for asserting that the process of substitution and ore formation is confined to the neighborhood of the surface. More probably it continues through the whole depth of the propylite, or, perhaps, 12,000 feet, and may be richer below than above.

That the presence of the barren zone, in which most of the mines have been working for years, is due merely to the existence of a flat dip there and that ore is likely to make as soon as this is passed, in any part of the lode, and the requisite steepness, or contrast of flat and steep dips in alternation is reached.

That the Comstock lode may not be the only productive lode in that region. There are other lines of quartz deposition, both west and east of it, as large as their great neighbor, and though they have never produced rich ore, that is no reason for saying that they never will. The ground that has been explored in them may be a barren zone, like that in the Comstock now, and if their exploration is continued intelligently better results may be obtained. The Professor says we must turn our eyes from the Comstock lode to the Comstock system of lodes, and that the latter may afford a varied mining industry for a great length of time.

Indeed, our author goes so far as to say that even the Bullion mine, which has never produced ore, may do so at some time, and this opinion, which may meet with incredulity in many quarters, he rests upon the fact that nothing in the ground of that mine indicates any impossibility of receiving ore. The Divide, on which it lies, may spread out and diminish in depth and better conditions come in.

From all these examples it may be seen that the author has very strong impressions of the permanence and value of our mining resources, and in these times of doubt and hesitation, his favorable impressions will be very acceptable.

He found that the propylite, and even the lode itself, contains fragments of tree trunks, and from this fact he concludes that the rocks were not poured out pell-mell, but in successive active periods, with long pauses between them.

The form of the bonanzas and the position of the ore are illustrated in six colored plates, which give the details of the Con. Virginia, California, Crown Point, Belcher and Justice ore bodies. Both horizontal and vertical sections are given, and they are made up in a way to show how extensive were the author's facilities for studying his ground. In addition, there are thirteen engravings, to illustrate more exactly various sections and positions of the bonanzas.

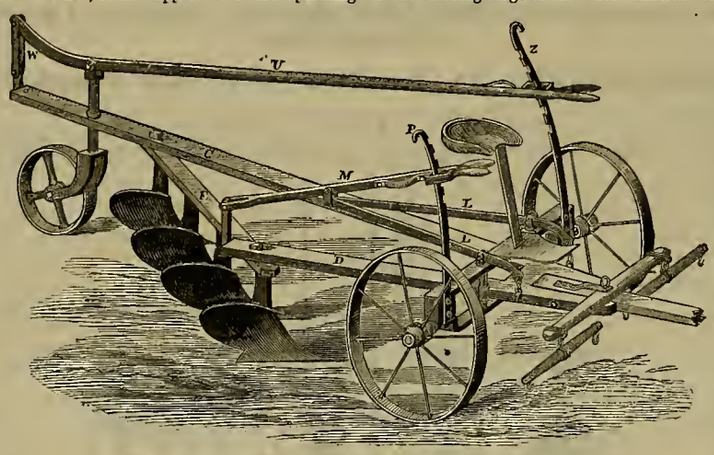
We have touched only one part of the author's subject, which also covers the formation of the country rock, the questions of heat, ventilation and drainage, bullion statistics, etc. All of these problems have unusual importance from the fact that the Comstock is only probably one of a great number of similarly-formed lodes. The lessons that are to be learned in its extensive openings are also valid elsewhere.

Hart & Nicholson's Gang Plow.

We illustrate herewith an improvement in gang plows, recently patented through the Mining and Scientific Press Patent Agency, by Rueben Hart and Milford P. Nicholson, of Santa Maria, Santa Barbara county. The bearing wheels of the plow are made of large diameter, and the axle which unites them is either cranked or bent upward; or the axle may be made short, and secured to each end of an axle bed, which may be cut away below, as shown, the object being to provide a space into which the plow beam, *C D*, can be raised in lifting the plows. These beams are united at the front, and support the pole, and they diverge as they extend backward, one being shorter than the other, as shown in the engraving.

The plows are secured by standards to the plank, *F*, extending between the beams. This plank is slotted at the points where the bolts secure it to the beams, so that its ends may be moved forward or back, so as to adjust the plows to or from the land. The forward ends of the beams pass above a strap under the axle bed, as shown. Stout rods extend from this strap up through the axle bed at each side of this space, and tubes are secured to the sides of the beams, so as to slide upon these rods and guide the plow beams in their vertical movement.

The upper ends of the rods, projecting above the axle bed, form supports for the operating lever. On each side of the plow beams, at the front ends, are secured eyes, and links unite these eyes with the ends of the levers, *L*. The long arms of these two levers are brought together at some distance behind the axle and upon the right, so that the single end may be united with the lever, *M*, by a link. This lever, *M*, has its rear end supported by a standard in the rear end of the plow beam, *D*, and serves as a fulcrum for the lever. The front end of the lever has a catch to engage with the rack-bar, *P*.



HART & NICHOLSON'S IMPROVED GANG PLOW.

By the use of this compound lever perfect control of the plow is gained, and the driver on the seat readily lifts the plow beams. The operating lever, *M*, is placed at one side of the machine; but by means of the forked or double levers, *L*, with their double bearings and lifting links, the weight is distributed so as to fall equally upon each wheel.

The peculiar action of the compound lever and standard is not only to raise the front ends of the plow beams, but also to raise the rear end of the beam, *D*. As the rear end of the beam, *C*, is supported on the caster wheel and the plows extend in a diagonal line from near this front to the rear end of the beam, *D*, it produces a tendency of this rear end of *D* to drag downward as the plows nearest to it enter the ground, and this combination of levers and standard counteracts this tendency.

In order to raise and lower the rear end of the beams, *C*, the standard of the caster wheel is fitted to move in a sleeve upon the side of the beam, and its upper end is connected with the lever, *U*, by a swivel shackle, or link, as shown. The rear end of the lever is curved, so that by the operation of the lever, the rear plows will be lifted more or less. This lever extends forward and has a rack and catch to hold it in any position.

The construction described has several advantages over the ordinary sulky or gang plows, among which may be enumerated the method of operating the front and rear ends of the plow-beams independently of each other, each end in turn serving as the fulcrum or point about which the other moves. This admits of the plow being employed to great advantage in laying out land, for which purpose the front end will be raised and the rear end depressed. This causes the rear plow alone to take the land, thus cutting a boundary furrow. By raising the rear end and depressing the front, the front plows alone may be used to finish up the last of a plowing.

When both ends are raised, the plows will be entirely clear of the ground, and as the caster wheel moves freely with its swivel standard, the machine may move around in either direction, swinging about a center between the wheels, so that the turning may always be accomplished upon solid ground. The arrangement of the levers produces great power, so that the plows may be easily handled by the driver from his seat. The team may be harnessed to the plow, and a load of seed be placed on the frame and hauled to the field, dispensing with the use of a wagon. Further information concerning this invention may be gained by addressing the inventors at the above address.

The Bodie Noondays.

In some editorial remarks in our last issue on the Bodie mines, we took occasion to speak of the exceptionally good management of the several claims that make up the Standard and Noonday groups. What we said of the latter it gratifies us to find confirmed by so good an authority as Joseph Wasson, who, besides possessing peculiar fitness, has enjoyed peculiar opportunities for forming intelligent and correct opinions in regard to these mines, concerning some of which he holds the following language: "The original Sandbank croppings, upon which the South Noonday is located, are identical in character with those of both the Noondays. The South Noonday joins the Queen Bee ground on the south, and the Standford company on the north. The trend of the dividing ridge of the whole mineral belt, moreover, is almost conclusive that the ledge now creating such lively anticipations in Orient ground must pass through the North Noonday, Noonday and South Noonday claims. The ores all along the line in question are of uniformly good milling character, the fissure, as a rule, being large and well-defined, suggestive of a permanent future for that portion of the belt through an abundance of ore."

Upon Mr. Wasson's ability as an expert, as well also as upon the inherent merits of the South Noonday, its management, prospects, etc., the *Stock Report* of this city comments in flattering terms, expressing the belief that the immensely rich body of ore already developed in the Original Noonday will be found in all its fertility and strength on the corresponding levels of the South Noonday, when these levels shall be reached. Of the management of the mine it says: "The property is in excellent hands, and we can give assurance that the owners have the means and the disposition to fully develop the mine. The President is George S. Ladd, a well-known business man of this city, with Directors chosen for their standing in the community as correct and honorable men." Fred. S. Eaton, of the firm of Miller & Eaton, heavy steamboat owners in San Francisco, exercises a general agency over the property, bringing to the discharge of his duties in that position first-class financial abilities and a long and successful experience in the mining world.

National Iron Works.—The new iron works of Cantrell & Marshutz, on the corner of Main and Howard streets, are nearly ready to start up and it is expected the first melt will be made by Monday or Tuesday. We shall give a description of these new works in our next issue.

It is said that Lesseps and his engineers having adopted the theory that the Israelites crossed near Lake Timsch, the Abbe Meigne, editor of *Les Mondes*, appeals "to the whole Christian world" to subscribe the requisite funds to enable "the relics of the army overcome by Almighty himself" to be brought to light.

Some Words to Investors.

The New York *Mining Record* of Oct. 18th, takes occasion to make a few remarks upon the above subject, incited thereto by a table recently published in the New York *Times*, showing the market price of certain railway stocks and bonds on the 7th of Oct., this year and last, respectively. The *Times* table shows in the aggregate an appreciation in the stock valuation of some 19 roads, over that of 1878, of $138,540,000, with a further appreciation for the same period on the valuation of the bonds of nine other roads, of $8,617,000.

The tables were originally prepared to show, apparently, that the business recovery of the country was entirely too healthy, and afforde an illustration of the tendency, in flush times in the East, to employ speculatively the accumulated capital of our great money centers in stock-gambling, rather than in fostering those industrial enterprises upon which really depend the prosperity of the country, namely, agriculture and mining, including metallurgy.

The *Record* remarks that nearly all of the railroad stocks are not only of no more value intrinsically to-day than they were 12 months ago, but absolutely they are *without any substantial value*. As the *Times* puts it, "the earth has holes as the water hath, and these are of them." While this is very rough language about the pet speculative material of the East, to wit, railroads, it is nevertheless true. Railroad securities to a great extent possess the certainty which may be urged of an ordinary game of draw poker, viz., luck. Within the past few years railway stocks to the amount of over one thousand million of dollars have become extinct, the last holder caught with stock losing his money.

The *Record* finds relief from this purely speculative, lottery ticket business of railway stocks in investments in mining enterprises, and we heartily coincide with the remarks of the *Record*, when the investment is properly made, as it can and should be. It says: The business done in stocks (railway stocks), intrinsically so valueless, adds nothing to the wealth of the country. Not so, in great part, with the money adventured in mining enterprises; it is employed in developing the subterranean riches of the land, and adding outright to the money material of the commercial world. Nor is this all. Every new mining field opened causes railways to be built that otherwise would have had no reason for being; it creates a demand for costly machinery, the construction of which gives employment to our skilled machanics; it widens and enlarges the field for a hundred business occupations that otherwise might be stifled by the competition incidental to a more contracted territorial area.

Can't be Done.

An "aggrieved stockholder" in the *Mining Record* has been trying to invest his spare cash in mining stocks, taking the representations of newspapers as his criterion of value, and finds trouble and vexation. He says he invests in certain mines which are considered good by one newspaper, and finds by another that he has made a losing investment, and learns to his horror "that he had placed his savings literally in a hole in the ground." Now he thinks some newspapers are contemptible for decrying every young and undeveloped mining property, especially the belittling and decrying of a great and immensely successful enterprise like the celebrated Eureka Con., and wants that sort of thing stopped. The individual who invests in stocks must to a certain extent "go it blind." It is said that the course of true love "never runs smooth," and we are quite sure that stock speculation is not smooth sailing. The investor pays his money and takes his choice. How he is to be helped by the newspapers withdrawing opposition to some mines, is not apparent to the naked eye. If every journal should combine and praise all mines as immensely rich, or immensely worthless, they wouldn't put one cent's worth of metal in the mine or take it away if there. Mines are very much like men: if they have any merits they will be found out and utilized fast enough. There may be an object in puffing a mine, as well as in decrying it. What that object is forms one of the intricacies of the stock business which would require a volume to explain. The business looks simple enough, but unfortunately it happens that the simplicity of the thing is not so much in the business as in the over-credulous investor. Beware of the g ft-bearing Greeks.

Five counties in California contain quicksilver mines. During the past three years the aggregate production has been, in flasks: Napa county, Redington mine, 25,493; Lake county, Sulphur Banks, 30,849, Great Western mine, 14,266; Sonoma county, Oakland, 4,687; Fresno county, New Idria, 17,846; Santa Clara county, Guadaloupe, 18,952, New Almaden, 56,488. A flask of quicksilver contains 76½ pounds.

A glass manufactory in Hanover, Germany, makes glass which is a close imitation of marble, and tables and floor tiles which are pronounced preferable to marble on account of their extreme hardness.

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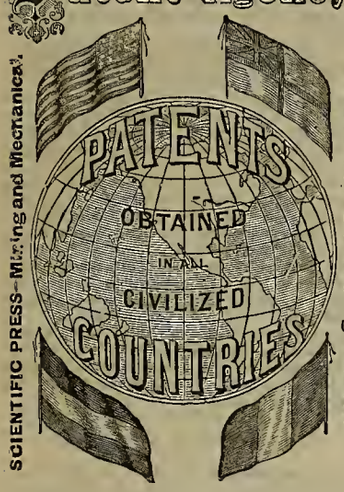

THE MINING AND SCIENTIFIC PRESS PATENT AGENCY was established in 1860—the first west of the Rocky Mountains. It has kept step with the rapid march of mechanical improvements. The records in its archives, its constantly increasing library, the accumulation of information of special importance to our home inventors, and the experience of its proprietors in an extensive and long continued personal practice in patent business, affords them combined advantages greater than any other agents can possibly offer to Pacific Coast inventors. Circulars of advice, free.

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I remain yours, etc., GEO. MEPINO.

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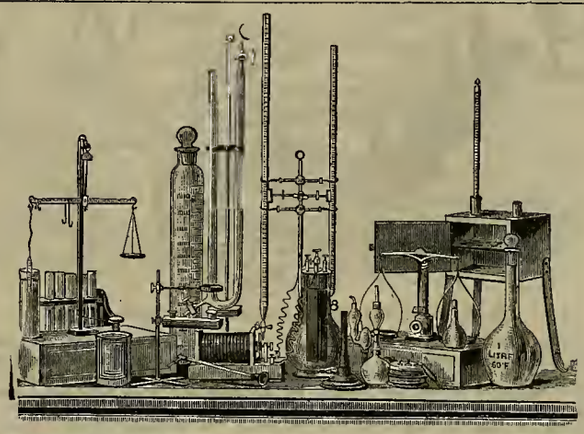

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Henry N. Copp's hand-book of mining laws, just issued, contains the United States mining laws and instructions thereunder, a digest of decisions, forms, list of mining patents issued, etc. The digest of decisions alone is a very valuable thing, giving, as it does, in brief form, all the decisions of the Secretary of the Interior and Commissioner of the General Land Office in relation to mining matters. These are all under proper headings for easy reference. Forms are given for notice of location, proof of labor, notice of forfeiture, miners' lien, application for survey, patent, etc., affidavit of improvements, etc. There is also a list of patents issued for mining claims from July 26th, 1866, to August 1st, 1877. The book is of pocket size and very convenient for all who are interested in mines. It will be sent post-paid for $1, on application to Dewey & Co., 202 Sansome street, San Francisco

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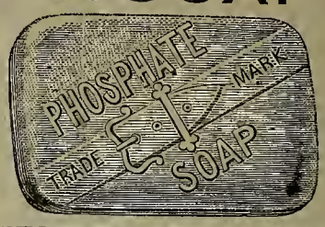

THE BEST soap for toilet use ever manufactured. BEST because it contains all the excellencies of the most expensive foreign or American soaps without their defects. BEST because it combines strength with delicacy in such a way that its strong detersive qualities do not injure the skin. BEST because it is the result of years of study and experiment in the soap manufacturing business, assisted by modern chemical discoveries. BEST because it contains ingredients beneficial to the skin, which unite chemically with the soap in such a manner as to increase its saponaceous qualities. Every chemist familiar with soap manufacture knows that some ingredients which are in themselves beneficial to the skin cannot be saponified; some are partially neutralized, while others injure the quality of the soap. There are soaps in the market which are to some extent beneficial to the skin, but they are inferior articles for toilet use. PHOSPHATE SOAP is the ONLY article offered to the public which combines all the best elements of toilet soap with medical ingredients beneficial to the skin.

If your wife is in the habit of using cosmetics of any kind, advise her to give up the pernicious practice, as the most harmless face powders obstruct the pores of the skin and sooner or later injure the complexion, while PHOSPHATE SOAP removes all impurities and assists nature in developing a natural, healthy and beautiful skin.

It is an old proverb that an ounce of preventive is better than a pound of cure. Twenty-five cents invested in a cake of PHOSPHATE SOAP will save hundreds of dollars in doctors' bills. It acts as a constant disinfectant, preventing Salt Rheum and other skin diseases.

If your wife will persist in the use of cosmetics, buy her a cake of PHOSPHATE SOAP and tell her to use it every night before retiring. In that way much of the harm will be avoided, as the skin will thereby be able to retain much of its natural vigor and beauty.

No salve or ointment can heal a wound or sore of any kind. Every educated physician will tell you that nature alone can do this. PHOSPHATE SOAP, by its cleansing, soothing and purifying qualities, gives nature a chance to act freely.

Natural beauty surpasses anything which can be imparted by artificial means. PHOSPHATE SOAP gives health to the skin simply by removing impurities and eradicating the poisons which give rise to skin diseases.

Not only for daily use on the face and hands, but for bathing the entire body, there is nothing equal to PHOSPHATE SOAP. It is a thorough disinfectant and removes offensive odors of every kind.

Ladies who have injured the skin by the constant use of cosmetics may do much to restore their faces to that beauty which nature alone can give by constantly using PHOSPHATE SOAP.

For all diseases of the skin use PHOSPHATE SOAP. There is nothing like it for removing impurities and giving the skin a healthy and natural vigor.

Cheap toilet soaps manufactured from rancid and refuse grease injure the skin and are really more expensive than PHOSPHATE SOAP, which retails for 25 cents per cake.

Thousands of articles are palmed off on the public which have no genuine merit, but PHOSPHATE SOAP is the result of modern discoveries of celebrated chemists.

PHOSPHATE SOAP costs no more than other good toilet soaps, while its medicinal qualities make it worth ten times its price to every man, woman and child.

If you want a nice article of Toilet Soap and something that is beneficial to the skin, buy PHOSPHATE SOAP.

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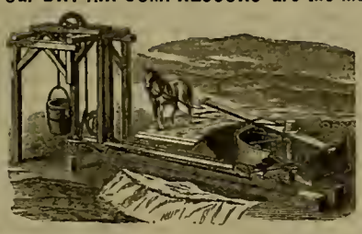

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The Power is mainly built of wrought iron, and cannot be affected by exposure. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending bucket. The frame of the Power is bolted to bed-timbers, thus avoiding all frame work. When required these Powers are made in sections for packing.

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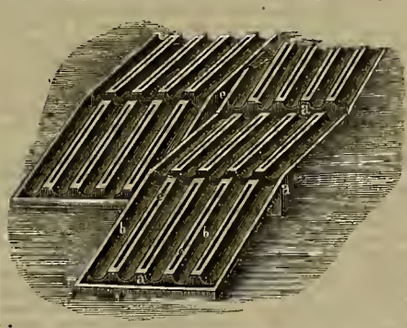

This invention meets a want which has long been felt by Gravel Miners and Millmen, viz.: that of a simple, cheap Riffle which will save the largest possible amount of gold or sulphurets, with the least possible waste of quicksilver. That this Riffle answers all these conditions will be apparent to any practical man who takes the trouble to examine it. The arrangement of this Riffle is such that there is a strong, unobstructed upper-current to carry off and break up the gravel or cement, and a slow under-current, checked by numerous riffles, which give gold or sulphurets a better opportunity of settling than if they were exposed to the force of the main current.

In this Riffle there are cast troughs for the quicksilver, which extend entirely across the sluice, and while they are so placed that the current will naturally pitch towards them, and give every opportunity for amalgamation, the quicksilver is fully protected from flouring or leakage. There is no mechanical skill required in taking out or replacing the sections.

Full particulars in regard to this invention can be obtained by applying to

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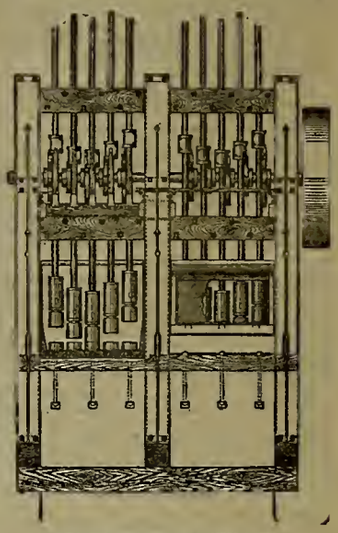

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The Prospector's "Wee Pet" Assayer, (Patented)	100 00
The Testing Machine for Gold, Silver, Lead, etc	40 00
The "Little Wonder" Self-calculating Sample and Button Weigher, (Patented)	25 00
Blow-pipists' Pocket Laboratory of Tools, Fluxes, etc.	50 00
Vest Pocket Blowpipe	3 00

CHARGES.—ASSAYING, $3; TESTING, $2 per metal.

Assaying and Testing Taught.

PETERSON & OLSSON,

MODEL MAKERS.

INVENTORS

Will find it to their advantage to call on us at 328 BUSH STREET, bet. Montgomery and Kearny, (up-stairs,) S. F

CONTINUED FROM PAGE 277.

ing ahead and sorting that which comes out of a 4x6 tunnel. Character of mineral—argentiferous, galena, antimonial, and chlorids of silver. The Paradise mine is yielding good ore, and plenty of it, with two or three months' run on the dump.

PEAVINE DISTRICT.

WASHOE COUNTY.—The Reno *Evening Gazette*, speaking of a visit to the mines of this district, says: The Manzonolda mine lies about four miles north of Reno and half a mile west of the Long valley road. The croppings are immense at the south end of the claim, where they surmount a very high ridge. A canyon crosses the north end of it, and Mr. Scott has made an open cutting just at the lowest point, which shows up a very promising ledge. There is some disturbance consequent upon the breaking up of the ground in some of nature's frolics, but the east wall is of very handsome blue clay mixed with sulphurets. The ledge has never been crossed, so no one can tell anything about it, but one thing is certain, the rock is full of rich sulphurets which will concentrate perfectly, and judging from the immense croppings, which are of the same character, there is no doubt of a mine there.

PIOCHE DISTRICT.

DAY MINE.—*Record*, Oct. 25: The Superintendent, A. S. Gould, in his last official letter, says: We are steadily taking out ore and sending it to the Hillside furnace, as per your orders. I have been obliged to considerably increase our force of men, a great deal of outside work being necessary in preparing for winter, especially upon roads to the ore-house and ore-dumps. We are driving down with one incline, from the lower tunnel level, as fast as possible, measuring to-day a depth of 34 ft. The bottom is all in ore of a moderate grade. The changes, however, are so frequent that it is difficult to determine the average quality. Our best ore thus far is in the north drift, and here we commenced stoping out to-day.

ARIZONA.

HUACHUCA.—Tucson *Star*, Oct. 23: An old mine has been discovered at the south end of the Huachuca mountains, near the Sonora line, which has created quite an excitement, owing to the high assays which have been got out of the debris of the old dump piles. It has been extensively worked at one time, and was doubtless an enterprise of the old Jesuit fathers of the past century. The high assays give the discoverers great assurance that they have a bonanza.

THE SANTA CATARINAS.—Parties in from the east side of the Santa Catarinas report the mines developing finely. Some very rich ore has been found near the American Flag mine, and also in Rea's camp. Assays of the former go as high as $1,300 per ton. These camps are well situated for wood, water and grass, and accessible from Tucson by good roads.

COLORADO.

FAIRPLAY MINES.—A correspondent from Alma in the Denver *Tribune* of recent date says: Several big strikes have lately been made in this camp. One was made by J. R. Lampkin on Buckskin hights, between the Phillips and Fanny Barret mines He was attracted by a fissure plainly to be seen on the walls of the cliff, which, on striking with his pick, exposed very fine galena, which for 6 ft, clear across the streak, rock and all on the surface gave a result of 41 ounces silver per ton. The lead was staked, located, and called the Earnest. Work was immediately commenced on it, and in a few days a streak of pay, 24 in. wide, was developed, showing very rich ore in native and ruby silver, and black sulphurets. A mill run was then had from it in Leadville, which ran 297½ ounces. At the present time they are down on it 5 or 6 ft, and have just struck the first contact at the bottom of the limestone. They are now taking out native silver, ruby silver, black sulphurets, free gold, native copper, and very fine carbonate of lead. The contact is plain to be seen, and can be traced through the Rock Island and adjoining claims to the Fanny Barret. The lower part of the contact is about 10 ft below where they are now working, and it is thought by experts that when it is reached very rich ore will be found. Another strike was made at the west side of Mount Bross. W. J. Mullen & Co., of Colorado Springs, have made a new strike, which assays higher than anything yet struck in the State, assaying from 5,855 to 23,385 ounces of silver to the ton. It is called the Becker lode, and is situated on the west slope of Mount Bross, some distance above timber line, and is thought to be the extension of the Dolly Varden. Carbonates have been struck in the last few days at the timber line on Mount Bross, which assay 60 ounces silver per ton. Captain Grose's find near the Dolly Varden is looking well. The largest strike of the season, however, has been made recently of sand carbonates above timber line four miles to the northwest of the old town of Montgomery on the Pacific slope. Five tons of the ore is reported to have brought its owners $9,000 in Leadville. Several new and rich finds have been made at the head of Pennsylvania gulch, and also on Sacramento. The Sacramento mine, in the latter place, shows an immense body of high grade ore, running 500 to 000 ounces silver per ton.

IDAHO.

YANKEE FORK ITEMS.—Speaking of the low grade ore belt the Yankee Fork *Herald* of Oct. 18 says: Messrs. Sweeney & Parks, on Tuesday last, located a 30-ft vein of quartz in the hills two miles below town and on the south side of the river. Assays show the extremely low grade of $12 per ton in gold and several dollars in silver. There is a vast belt of this low grade ore on that side of the river, and extending through to the high mountains some miles to the south. The top ore assays all the way from $8 to $20 per ton in gold with traces of silver. Owing to the inferiority of the quartz compared with that of other sections of the Yankee Fork district, little attention has been given it, and no ledge has been prospected beyond the depth of a few feet.

SOME very fine carbonate ore is being shipped from the Beardsley. This ore averages about 140 ounces in silver and 35% lead.

WE learn that our friend Ned Rotch, who prospected in these parts several weeks during the past summer, has recently struck the richest silver ledge yet found in the Saw Tooth district. The ledge carries a small vein of black sulphurets nearly half silver, assaying as high as $15,000. Are we yet prospecting pards, Ned?

OREGON.

MONUMENTAL MINE.—A correspondent of the Grant Co. *News*, speaking of this mine, says: The mill building is about 200 yards west of the mine, is 100x150 ft, and nearly 75 ft high. The mill will work about 20 tons of quartz per 24 hours, requiring 9 men. Describing the mine proper the writer says: In traveling a distance of 700 feet we were shown 16 different veins or ledges of quartz, each from 4 in. to 3 ft in width, all dipping towards No. 3, and apparently coming together at no very great distance below. No. 3 consists of a group of ledges occupying a space of perhaps 40 ft, and in most mining camps would be called a 40-ft ledge. From appearances I should say that the most work has been done on No 13, or Monumental, although drifts or levels have been run on nearly all the different veins, each side of the main crosscut, varying in length from 150 to 225 ft. On Nos. 3, 12, 13 and 16 the work of opening the stopes and putting in ore chutes has just begun, and although there were only 12 men at work in the mine, we could see that it would be an easy matter to find room for 100 more. On ledge No. 13 an air shaft has been raised to the surface, a distance of 300 ft, and is a chute for the ore and a manway for the workmen to go up and down. This shaft is timbered all the way from top to bottom, with heavy timbers, framed in after the fashion of making log houses, leaving a space inside of about 2½ by 6 ft, with a partition in the middle to protect the manway from the falling ore in the chute. After examining all of the different drifts on a level with the main tunnel, we were conducted up the manway of the air shaft to the 200-ft level on No. 13, where we found the vein of quartz varying in width from 8 to 30 inches, and rich in ruby and antimonial silver. Leaving this level we ascended to the 100-ft level, where we were shown along the level for a distance of 150 north, to the bottom of the old prospecting shaft of the discoverers, and at a depth of 100 ft from the surface.

ITEMS.—Jacksonville *Sentinel*: Geo. W. Elliott & Co. have an arastra running on the quartz taken from their ledge near Willow Springs. The vein they are on prospects very rich, and they anticipate realizing a profit from their prospecting operations with their present appliances. The gold obtained is free from sulphates or other base metals and easily saved.

BIG NUGGET.—Messrs. C. Y. Miller and James Eaton, who have been at work mining on Elliott creek, a tributary of Big Applegate, recently took out of their claim a nugget of pure gold weighing $120. They have taken out many smaller pieces weighing from an ounce to $3 to $5, besides a considerable amount of fine gold. Reames Bros. purchased the large nugget.

Mineral Veins and the Electric Current

The Grass Valley *Union* of October 25th says:

"Mr. Phillips, who claims for his electric machine the merit of indicating the course of mineral-bearing veins, and their relative size and character, has lately been experimenting upon the Iron-Clad mine, below Rough and Ready. He found the shaft to have been sunk upon a stringer of good size, but not upon the main ledge. The instrument indicated the lay of the main ledge, which was some distance from the stringer, and from following this indication the main ledge has been found cropping out strongly in a ravine, where it had not before been discovered, and showing a width of from ten to twelve feet. Miners generally do not place faith in the discovery of ledges by such means, but Mr. Phillips has unlimited faith in the efficacy of the machine, claiming that it is just as practicable to use electricity in discovering the existence and course of blind ledges as utilizing it above ground or under water in transmitting telegraphic intelligence. Prof. Edison, we believe, advanced similar ideas when he visited the Comstock. The possibilities of science are very great, and experience will yet demonstrate whether this is one of them."

We give the above to illustrate the modern tendency of science to experiment upon old ideas with recent mechanical appliances.

Fifty years ago (in 1830), the relation between metallic veins and the electric current was discussed in the *Institut de France* (*seance du 18 Octobre*), and it was announced that William Fox, from observations made in the mines of Cornwall, had discovered that their veins exerted a manifest action upon the magnetic needle. *The direction of the currents being in accord with the inclination of the vein, and the axis of the magnetic poles.* "*La direction des courants était en rapport avec l'inclinaison des filons et avec l'axe des poles magnetiques.*"

Debreyne, in his "*Theorie de la Cosmogonie et de la Geologie,*" in 1856, upon the subject of the formation of metallic veins (page 245), says: "I attribute them (the veins) to the action of the telluric and even heliocal currents which traverse the terrestrial beds, and there incessantly deposit or modify certain metallic substances. Basing this hypothesis upon the belief that the earth is similar to a galvanic battery which transports elementary molecules in the same manner as the Voltaic pile.

"*Nous les attribuons a l'action des courants telluriques et meme heliaques, qui, traversant les couches terrestres, y deposent ou y modifient incessament certaines substances metalliques * * * et transportent des molecules elementaires absolument comme les courants de la pile Voltaique.*"

We might cite many other instances of the connection between metalliferous veins and the electric current, but we have said enough to show that the idea is not new. Perhaps if the same amount of investigation were bestowed upon this theory of the formation of mineral veins, more might be accomplished than through other speculations.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Christy, October 22d, $5,315.00; Martin White, October 19th, $4,550.90; Bodie Con., October 28th, $16,500.00; Northern Belle, October 25th, $4,912.66; Alexander, October 24th, $4,626.90; Standard Con., October 27th, $20,022.45; Hillside, October 29th, $4,000.00; Martin White, October 26th, $6,197.85.

THE "ATLAS" MINING COMPANY listed their stock on the San Francisco Board yesterday. We hope to see the "Atlas" prove a bonanza, the same as Leeds and the great Ontario that has paid its millions in dividends and never was assessed. Utah mines rank high both here and in the East, as both rich and productive, equal to any other mines on this coast.—*Stock Report, Oct. 24th.*

SETTLERS on the Los Bolsas Rancho, Los Angeles county, are peaceably submitting to the legal proceedings taken to eject them.

THE British and German governments have favorably received the recent circular of Secretary Evarts in regard to Mormonism.

THE revenue of Russia last year amounted to 625,972,000 roubles, and the expenditures aggregated 1,033,972,000 roubles.

THE captive women and children of the White River Agency have been delivered in safety to Special Agent Adams.

Some Leadville Items.

A correspondent in the Denver *Tribune*, thinks the interest in Leadville is increasing. With regard to the mines of the great carbonate camp he says:

At no time in its history has there been more satisfactory progress made in opening and developing the mines than is being made now. The older and better known mines not only keep up their well-earned reputation, but are constantly increasing in value as the work progresses. Fryer hill still maintains its ascendancy, as is evidenced from the rich discoveries recently made in the Little Pittsburg, Little Chief, Robert E. Lee, Duncan and others.

The former, after sinking a shaft 80 feet below the first deposit, has come upon a rich bed of high-grade ore, equal to any that has formerly been taken from this valuable property. This discovery seems to upset the prevailing theory among experts of the existence of but one stratum of carbonates in the Leadville deposits. Others, who have held to the opposite doctrine, that where there was one deposit there was good reason for believing that others existed below, regard the Pittsburg lower stratum as a separate and distinct deposit from the one above—a stratum, the existence of which cannot be explained, either upon the "break" or falling theories, so persistently adhered to by some of the older mining experts and geologists.

The Little Chief immediately adjoining the latter, has also gone down upon a large body of very excellent mineral, which fully sustains the reputation this valuable mine has long enjoyed, of being one of the richest in the whole camp. This mine has probably paid its fortunate owners more than the full amount expended in its purchase, and can still exhibit some of the finest bodies of ore to be found in any mine in the world.

A few hundred feet to the west of the last-named mines are the Robert E. Lee, the latest wonder, the Duncan, Matchless and Climax. These have recently proved to be equally as valuable as those found earlier upon this remarkable hill. The Robert E. Lee has, within the past few days, turned out ore of surprising richness, mill runs from which have run from 1,000 to 15,000 ounces in silver to the ton. The statement made by one of the principal assayers yesterday, that this ore carried from 60% to 85% in silver, shows the wonderful richness of this last bonanza. The claim is a very small one when compared to the full extent allowed by law, but the high-grade ore fully compensates for the loss of territory. One or two acres of such mineral will suffice to make millionaires all those fortunate enough to possess an interest in this claim. The Lee is owned by Colorado Springs parties.

The Duncan, Matchless and Climax, immediately adjoining, are also valuable mines, which are growing richer every day. In fact, Fryer hill seems to be turning out better even than its most sanguine friends dared predict. Scarcely a mine on this hill has been worked for profit alone, most of them being opened simply for development, and yet there are croakers who seem to take a particular delight in predicting the early decay of Leedville and its wonderful mines. If there were no other properties in the district, save those on Fryer hill, this camp would be the liveliest mining camp in the whole county for some time to come. But there are other localities which are rich in promise, some of which even have shown rich mineral and in seemingly inexhaustible bodies.

Carbonate hill, which promised to fairly eclipse the older sister, has made no important developments since the rich strike in the Morning Star. Several claims on the western side of this hill, below the Carbonate, Crescent and Pendery, have suspended operations after working bravely through the summer months, hunting after the deposits which were believed to exist below the Pendery. A visit to the hill recently showed most of its claims idle, and in some cases the machinery had been removed. The Welden, which has a shaft down 230 feet and upwards, has failed to find mineral in quantities sufficient to pay. The Gem of Leadville, still lower down the hill, is seriously troubled with water; in fact, to such an extent as to stop all further operations pending the arrival of hoisting machinery. The St. Mary's, Big Dutchman, Lazy Bill, Machuckinock, Cosmopolitan, Pocahontas and some others have stopped work entirely.

On Bruce hill the excitement still continues, and rich ore is being taken in large quantities from the Highland Chief, Colorado Prince, Miner Boy, Lowland Chief and others. A stamp mill is about to be erected near the Colorado Prince. The ore from this mine is rich in gold, as well as valuable for its silver.

The town itself is as busy to-day as at any time since the mining excitement first began. Buildings are going up in all parts of the town, some of which would be a credit to any section of the country. The new Opera House is being closed in rapidly, and will no doubt be ready for occupancy about the middle of the present month. Another theater has just been put up at the head of Harrison avenue, on Chestnut street, to be opened as soon as completed, or about the 10th instant. Some Boston parties recently purchased four lots on Harrison avenue, above the Clarendon Hotel upon which they are erecting a large two-story building, to be rented for business purposes and offices. Nearly all the rooms are already rented, although the building will not be completed for several weeks yet. There is great demand for dwelling-houses, for which high rents are offered. This demand indicates a change in the character of the permanent population of the city. Last winter there were but few females in the town, whereas now quite as many ladies can be seen upon the streets as in most towns and cities of the same number of inhabitants.

The gas works are completed and mains laid through all the principal streets. Probably before November 1st the streets will be lighted with gas and a metropolitan aspect thus be given the magic city.

Decisions of Commissioner of Patents.

Ex-parte Sullivan & Burke.

Decided August 26, 1879.

The name, "Bob Ingersoll," associated with the representation of the bust and head of a man, is registrable as a trade-mark for cigars, Mr. Ingersoll having filed his consent, in writing, to the registration.

Interlocutory Appeal—Trade-Mark.

Application of Sullivan & Burke, filed June 4, 1879. Mr. Thomas S. Sprague for appellants; Paine, Commissioner:

The applicants seek to register, as a trade-mark for cigars, the words "Bob Ingersoll," associated with the representation of the bust and head of a man. The examiner declines to register this trade-mark, on the ground that the applicants have no right to appropriate the name of Mr. Ingersoll for such a purpose. Mr. Ingersoll has obviated this objection by filing his consent, in writing, to the registration.

The trade-mark will be duly registered.

Burgess vs. Wetmore—Magazine Fire-Arms

Decided August 26, 1879.

1. As against a prior applicant, who had reduced the invention to practice before his application was filed, it is necessary for a subsequent applicant to show, not only priority of conception and diligence in the prosecution of the invention, but also a lawful reduction to practice.

2. A concession of priority is, under the rules, binding upon the parties to the concession, and also upon all the parties to the interference. But the rule goes no farther. It permits no party, by a concession, to fix the date of an invention of another party as against a third party to the interference. It renders no statement of foreign matter, introduced into the concession, legal evidence against, except the persons who make them.

3. The reduction of an invention to practice by a person who is not the inventor nor the agent of the inventor, even though he may have derived his knowledge of the invention from him, is not equivalent to a reduction to practice by the inventor himself. The law accords the patent to the latter applicant, who connects, by due diligence, a prior conception, not with a reduction to practice by some one else, but with a reduction to practice by himself or his agent.

News in Brief.

MIDHAT PASHA has resigned the Governorship of Syria.

STANDARD silver dollars coined to date, 44,453,850.

GORTSCHAKOFF is expected at Berlin, November 11th.

A NEW Stock Board has been organized in New York.

IN eastern Siberia 200 inhabitants have died from famine.

GENERAL KAUFMAN has left St. Petersburg for Tashkend.

THE forces at Cabul will occupy Butkhak the 1st of November.

TROUBLE is said to be imminent between Russia and Persia.

A FLOOD in Jamaica has caused a great loss of life and property.

THE Roumanian Senate has passed the bill for the relief of the Jews.

ALL devices for arresting the phylloxera pest in France have failed.

THE nailmakers of South Staffordshire, Eng., have resolved to strike.

WORK on the Northern Pacific railroad is being vigorously prosecuted.

THE Republican majority on joint ballot in the Ohio Legislature is 31.

THE tunnel fire on the Pittsburg and Connellsville railroad is still burning.

SIR RICHARD KINDEYSLEY, formerly Vice Chancellor of England, is dead.

SERVIA and Montenegro have concluded an offensive and defensive alliance.

THERE arrived at Castle Garden, New York, Saturday last, 1,020 immigrants.

BUSINESS in nearly all branches of trade was resumed at Memphis yesterday.

THE inquiry into the massacre of the British Embassy is proceeding at Cabul.

ALL the constitutional amendments proposed at the late Ohio election were lost.

THE military and police are to co-operate in night patroling at Moscow, Russia.

REV. THOMAS CALLAN, assistant pastor of St. Mary's church at Stockton, is dead.

THE wheat crop of the United States this year will aggregate 425,000,000 bushels.

THE President pardoned Dr. Eddins, convicted of ballot-box stuffing in Tennessee.

THE Schaefer-Slosson billiard match at New York, 3,000 points, was won by Schaefer.

THE new elections for the Bulgarian Assembly resulted in a majority for the government.

A MASS MEETING of Irish residents was held Wednesday in New Orleans, for the purpose of considering the condition of affairs in Ireland.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING OCTOBER 21ST, 1879.

220,803.—WASHING MACHINE—James Carroll, S. F.

220,751.—WINDMILL—Z and F. M. Cottle, Oakdale, Cal.

220,757.—APPARATUS FOR MAKING AND LAYING CONCRETE PIPE—E. M. Hamilton and C. N. Earl, Los Angeles, Cal.

220,753.—ELEVATOR—P. Hinkle, S. F.

220,766—TUYERE—T. McCaffery, S. F.

220 728—ELECTRIC LAMP—D. Pendleton, S. F.

220,780.—CANDLESTICK—A. J. Smith, Ukiah, Cal.

220,780.—PHOTOGRAPHIC EMBOSSING PRESS—N. Weston, San Francisco.

220,777—STEAM DE WATER ENGINE—A. G. Waterhouse, Sacramento, Cal.

7,745.—CANNED SALMON AND OTHER FISH—Trademark—W. T. Coleman & Co., S. F.

7,746.—MEDICAL COMPOUND—Trademark—W. McCurdy, Stockton, Cal

2,006.—Title "NICHOLL'S INFALLIBLE INJECTION"—Label—E. H. Baxter, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

THE St. Louis and San Francisco railroad is to be completed from Vinita, Indian Territory to the Pacific ocean; $20,000,000 of German capital at 5% has been offered to construct it. Vice President Baker says the arrangements are now being made.

IN San Francisco half dollars are quotsd at 99⅞ buying, 100 selling; trade dollars, 95 buying, 96½ selling; Mexican dollars, 91 buying, 92 selling.

Back Numbers Wanted.

The following volumes and single copies of the MINING AND SCIENTIFIC PRESS are wanted at this office, for which a reasonable price is offered:

Year.	Volume.	
1870	20	2 Complete volumes, 1st half (of year).
1870	20	2 Copies of No. 2, Jan. 1st.
1870	20	1 Copy each of No. 1, Jan 1st, 3 of Jan. 14th, 7 Feb. 11th, 6 Feb. 4th.
1870	21	1 Copy of No. 7, August 13th.
1871	22	5 Copies of No. 1, Jan. 7th.
1871	22	3 Copies of No. 5, Feb. 4th.
1871	22	1 Copy of No. 3, Jan. 21st, 6 of Feb. 2d, and 1 of May 1st.
1871	23	1 Copy of No. 2, July 15th, and 9 Sept. 2d.
1872	24	2 Copies of No. 1, Jan. 27th.
1872	24	3 Copies of No. 7, Feb. 17th.
1872	24	2 Copies of No. 17, April 27th.
1872	25	1 Copy of No. 10.
1872	25	1 Complete volume, last half (of year).
1873	26	3 Copies of No. 8, Feb. 22d.
1873	26	3 Copies of No. 0, March 1st.
1873	26	2 Copies of No. 10, March 8th.
1873	26	1 Copy of No. 7, Feb. 15th.
1873	27	3 Copies of No. 20, Nov. 15th.
1873	27	4 Copies of No. 21, Nov. 22d.
1873	27	3 Copies of No. 24, Dec. 13th.
1875	30	1 Copy of No. 4, Jan. 23rd.
1875	30	1 Copy of No. 5, Jan. 30th.
1875	30	1 Copy of No. 8, Feb. 20th.

Advertising Hints.

My success is owing to my liberality in advertising.—*Bonner.*

How can the world know a man has a good thing unless he advertises the possession of it?—*Vanderbilt.*

Advertising is the oil which tradesmen put in their lamps. They that are unwise put no oil in.

People are quite apt to go where their attention is called. If they find things as represented, they will purchase in preference to spending their time elsewhere.

The road to fortune is through printer's ink.—*P. T. Barnum.*

Frequent and constant advertising brought me all I own.—*A. T. Stewart.*

Success depends upon a liberal patronage of printing offices.—*J. J. Astor.*

My son, deal with men who advertise, you will never lose by it.—*Benj. Franklin.*

Where is "parte unknown?" asks a correspondent of the *Danbury News.* Bailey answers: "Where they don't advertise." Though Bailey does say it, this is no joke.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Gruher's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

HOW TO STOP THIS PAPER.—It is not a herculean task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter.*

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

EXTRA COPIES can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

EXPERIMENTAL MACHINERY, drawings, patterns, models, all kinds of electrical and telegraphic apparatus to order. See ad. F. W. FULLER, 415 Market St., second floor, S. F.

Chew JACKSON'S BEST Sweet Navy Tobacco

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANDISDD, October 23, 3 P. M.

SILVER, 25.

GOLD BARS, 890@910. SILVER BARS, 10@18 ⅌ cent. discount.

EXCHANGE on New York, 20, on London bankers, 49½@49¾. Commercial, 50; Paris, five francs ⅌ dollar; Mexican dollars, 92.

LONDON Consols, 97 13-16; Bonds (4%), 105¾.

QUICKSILVER in S. F., by the flask, ⅌ lb, 33½c.

GENERAL MERCHANDISE.

[WHOLESALE.]

WEDNESDAY M., October 29, 1879.

CANDLES.

Crystal Wax	17 @—
Eagle	12 @—
Patent Sperm	30@—

CANNED GOODS.

Assorted Pie Fruits, 2½ lbs cans	2 25 @ —
Table do	3 50 @ —
Jams and Jellies	3 75 @ —
Pickles, bf gal	3 25 @ —
Sardines, qr	67½@1 90
Hf Boxes	2 50 @2 75
Merry, Fault & Co.'s. Preserved Beef, 2 lb. doz	3 75 @4 00
do Beef, 4 lb, doz	5 50 @ —
Preserved Mutton, 2 lb. doz	3 75 @ —
Beef Tongue	6 50 @ —
Preserved Ham, 2 lb. doz	6 50 @ —
Devilled Ham, 1 lb. doz	5 50 @ —
do Ham, ½lb doz	3 00 @ —
Boneless Pigs Feet, 3 lbs	4 50 @ —
2 lbs	3 75 @ —
Spiced Fillets, 2 lbs	4 25 @ —
Head Cheese, 3 lbs	4 25 @ —

OAL—Jobbing.

Australian, ton	6 00 @ 6 50
Coos Bay	— @ 5 50
Bellingham Bay	— @— —
Seattle	5 50 @ 6 00
Cumberland	12 00 @15 00
Mt Diablo	4 75 @ 6 00
Lehigh	11 50 @12 50
Liverpool	5 00 @ 6 50
West Hartley	— @ 8 00
Scotch	— @ 8 00
Scranton	@— —
Vancouver Isl	8 00 @— —
Oharcoal, sack	75 @— —
Coke, bush	60 @— —

COFFEE.

Sandwich Id, lb	— @— —
Costa Rica	16 @ 16½
Guatemala	16 @ 16½
Java	25 @— 26
Manila	17 @— —
Oreund, in cs	25 @— —

FISH.

Sac'to Dry Cod	— @ 4
do in cases	5 @ 6
Eastern Cod	— 7 @— 7½
Salmon, bbls	8 00 @ 9 00
Hf bbls	5 00 @ 5 50
1 lb cans	1 10 @ 1 12½
Pkld Cod, bbls	22 00 @— —
Hf bbls	11 00 @— —
Mackerel, No. 1. Hf Bbls	9 50 @10 00
In Kits	1 85 @ 2 10
Ex Mess	3 25 @— —
Pkld Herring, bx	3 00 @ 3 50
Boston Sinkd H'g	70 @— —

LIME, Etc.

Plaster, Golden Gate Mills	3 00 @ 3 25
Land Plaster, tn	10 00 @12 50
Lime, Sta Cruz, bbl	1 25 @ 1 50
Cement, Rosendale	2 00 @ 2 25
Portland	4 00 @ 4 50

NAILS.

Assted sizes, keg	2 70 @ 2 75

OILS.

Pacific Olive Co's Neatsfoot, No 1	1 00 @ 90
Castor, No 1	1 35 @— —
do, No. 2	1 30 @— —
Baker's A A	1 25 @1 30
Olive, Plagniol	5 25 @6 75
Possel	4 75 @5 25
Palm, B	9 @— —
Linseed, Raw, bbl	78 @— —
Boiled	80 @— —
Cocoanut	55 @— —
China nut, cs	— @ 65
Sperm	1 40 @— —
Coast Whales	— @— 32½
Polar	— @— 35
Lard	— @— 70
Oleophine	22 @— 22
Devoe's Brill't	17½@ 18½
Photolite	— @— —
Nonpariel	31 @— 32½
Eureka	18 @— 42½
Barrel kerosene	20 @— —
Downer Ker	35 @— —
Elaine	37½@— —

PAINTS.

Pure White Lead	6 @ 8½
Whiting	1½@— —
Putty	4 @ 5
Chalk	1½@— —
Paris White	2½@— —
Ochre	3½@— —
Venetian Red	3½@— —
Averill Mixed Paint, gal. White & tints	2 00 @2 40
Green, Blue & Ch Yellow	3 00 @3 50
Light Red	3 00 @3 50
Metallic Roof	1 30 @1 60

RICE.

China, Mixed, lb	4½@ 5
Hawaiian	6 @— —

SALT.

Cal. Bay, ton	15 00 @22 50
Common	10 00 @12 00
Carmen Id	12 00 @14 00
Liverpool fine	19 00 @— —

SOAP.

Castile, lb	8 @ 15
Common brands	4½@ 8
Fancy brands	7 @ 8

SPICES.

Cloves, lb	— @ 45
Cassia	19 @ 20
Nutmegs	85 @ 87½
Pepper Grain	— @ 12
Pimento	19 @ 20
Mustard, Cal, ½ lb glass	— @1 25

SUGAR, ETC.

Cal. Cube, lb	— @ 10½
Powdered	— @ 10½
Fine crushed	— @ 10½
Granulated	— @ 10
Golden C	— @ 8½
Cal. Syrup, kgs	70 @— —
Hawaiian Mol'sses	26 @ 30

TEA.

Young Hyson, Moyune, etc	— @ 51
Country pckd Gunpowder & Imperial	— @ 42½
Hyson	30 @ 35
Fooo-Chow O	35 @— —
Japan, 1st quality	40 @— —
2d quality	20 @ 2

METALS.

[WHOLESALE.

WEDNESDAY M., October 29, 1879.

IRON.—	
American Pig, soft, ton	28 00 @35 00
Scotch Pig, ton	26 00 @30 00
American White Pig, ton	25 00 @— —
Oregon Pig, ton	28 00 @35 00
Refined Bar	4 @ 3
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 8
Norway, according to thickness	7 @ 8
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @ —
TIN PLATES.—	
10x14 I O Charcoal	8½@ 9
10x14 I O Coke	7 @ 7
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft, 7 to 10, lb, less than cask	9½@— 10
NAILS.—	
Assorted sizes	3 50@4 50

LEATHER.

[WHOLESALE.]

WEDNESDAY, M., October 29, 1879.

Sole Leather, heavy, lb	22 @ 29
Light	20 @ 24
Jodot, 8 Kil., doz	48 00 @50 34
11 to 13 Kil	45 00 @57 00
14 to 19 Kil	61 00 @78 00
Second Choice, 11 to 16 Kil	55 00 @70 00
Cornellian, 12 to 18 Kil	57 00 @67 00
Females, 12 to 13 Kil	63 00 @67 00
14 to 16 Kil	71 00 @76 00
Simon Ullmo, Females, 12 to 13 Kil	58 00 @62 50
14 to 15 Kil	66 00 @70 00
16 to 17 Kil	72 00 @74 00
Simon, 18 Kil	61 00 @63 00
20 Kil	65 00 @67 00
24 Kil	72 00 @74 00
Robert Calf, 7 and 9 Kil	35 00 @40 00
Kips, French, lb	1 00 @ 1 35
Cal. doz	40 00 @60 00
French Sheep, all colors	8 00 @15 00
Eastern Calf for Backs, lb	1 00 @ 1 25
Sheep Roans for Topping, all colors, doz	9 00 @13 00
For Linings	5 50 @10 50
al. Russet Sheep Linings	1 75 @ 4 50
oot Legs, French Calf, pair	4 00 @— —
BOood French Calf	4 00 @ 4 75
Best Jodot Calf	5 00 @ 5 25
Leatbor, Harness, lb	35 @ 37½
Fair Bridle, doz	48 10 @72 00
Skirting, lb	33 @ 37
Welt, doz	30 00 @50 00
Buff, ft	15 @ 17
Wax Side	15 @ 17

LUMBER.

WEDNESDAY M., October 29, 1879.

CARGO PRICES OF PUGET SOUND PINE

REDWOOD.

Rough, M	13 00
Refuse	9 00
Clear	23 00
Clear Refuse	13 00
Rustic	23 50
Refuse	18 00
Surfaced	20 00
Refuse	14 00
Flooring	20 00
Refuse	12 00
Beaded Flooring	23 00
Refuse	13 00
Half-inch Siding	16 00
Refuse	10 00
Half-inch Surfaced	20 00
Refuse	14 00
Half-inch Battens	16 00
Pickets, Rough	11 00
Rough, Pointed	12 50
Fancy, Pointed	18 00
Shingles	1 75

RETAIL PRICE.

Rough, M	18 00
Fencing	18 00
Flooring and Step	28 00
Narrow	30 00
2d quality	25 00
Laths	3 50
Furring, lineal ft	

REDWOOD.

RETAIL PRICE.

Rough, M	18 00
Refuse	14 00
Pickets, Rough	15 00
Pointed	18 00
Fancy	22 50
Siding	30 50
Surfaced & Long Beaded	30 00
Flooring	30 00
Refuse	22 50
Half-inch Surfaced	30 00
Rustic, No. 1	30 00
Battens, lineal ft	
Shingles M	2 00

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending October 28, 1879.

HIGHEST AND LOWEST BAROMETER.

Oct. 22	Oct. 23	Oct. 24	Oct. 25	Oct. 26	Oct. 27	Oct. 28
30.112	30.285	30.317	30.255	30.202	30.269	30.117
29.043	30.155	30.241	30.138	30.155	30.133	29.900

MAXIMUM AND MINIMUM THERMOMETER.

67	58	65	72	81	80	78
54	52	55	55	62	62	60

MEAN DAILY HUMIDITY.

82	80.7	76	60.7	41	48	52.3

PREVAILING WIND.

W	W	W	NE	NE	NE	NE

WIND—MILES TRAVELED.

152	212	163	70	112	66	70

STATE OF WEATHER.

Fair.	Fair.	Fair.	Clear.	Clear.	Clear.	Clear.

RAINFALL IN TWENTY-FOUR HOURS.

Total rain during the season, from July 1, 1879. 0.81 in.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Alpha Hydraulic Gravel Mining Company.

Principal place of business, San Francisco, California. Location of works, Alpha Hill, Nevada Co., California.

Notice is hereby given that at a meeting of the Board of Directors held on the 2nd day of October, 1879, an assessment (No 1) of Twenty Cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold and silver coin, to the Secretary, at the office of said Company.

Any stock upon which this assessment shall remain unpaid on the Tenth day of November, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the Thirteenth day of December, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. JAMES IRELAND, Sec'y.

Office, No. 216 Sansome street, San Francisco, California

Numa Mining Company.—Principal Place

of business, San Francisco, California. Location of works, Humboldt County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 23rd day of October, 1879, an assessment (No. 2) of Two Cents (2) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 328 Montgomery St., room 21, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 24th day of November, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 15th day of December, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

DAVID WILDER, Secretary.

Office, 328 Montgomery St., Room 21, San Francisco, Cal.

Annual Meeting.—Maryland Consolidated

Gold and Silver Mining Company.

The annual meeting of the stockholders of the Maryland Consolidated Gold and Silver Mining Company, for the election of Directors for the ensuing year, and for the transaction of such other business as may properly come before the meeting, will be held at the office of the Company, No. 202 Sansome St., room 1, on the Fourteenth day of November (second Friday), 1879, at 1 o'clock P. M. Transfer books will be closed Tuesday, November 4th, at 3 P. M.

E. P. FARNSWORTH, Secretary.

Orion Mining Company.—Location of

principal place of business, San Francisco, California. Location of works, Iowa Hill, Placer County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 8th day of October, 1879, an assessment (No. 5) of Thirty (30) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 28 Sansome street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 10th day of November, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on Tuesday, the 25th day of November, 1879, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors. P. CONKLIN, Secretary.

Office, No. 28 Sansome St. (up-stairs) San Francisco, Cal.

The Pacific Land and Trust Company.—

Location of principal place of business, 513 California street, San Francisco, Cal.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 1) levied on the Eighteenth day of September, 1879, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Am't.
Benj. Flint	1	100	$125 00
D W F Biske	3	100	125 00
E W Steele	4	100	125 00
John A Ledden	5	100	125 00
R P Layton	7	100	125 00
Benj. Flint	16	520	650 00
E P Billings	18	40	50 00
R P Layton	20	1600	2000 00

And in accordance with law and an order of the Board of Directors made on the 18th day of September, 1879, so many shares of each parcel of said stock as may be necessary will be sold at public auction at the office of the Pacific Land and Trust Company, 513 California street, on the 15th day of November, 1879, at the hour of two o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

WM. ANDREWS, JR., Secretary.

Office, 513 California street, San Francisco, Cal.

ANNUAL MEETING.

Napa Consolidated Quicksilver Mining Company.

The regular annual meeting of the Napa Consolidated Quicksilver Mining Company will be held at the office of the Company, room 7, Safe Deposit Building, 328 Montgomery street, San Francisco, California, on Wednesday, the twelfth day of November, 1879, at the hour of 2 P. M., for the purpose of electing a Board of Directors to serve during the ensuing year, and the transaction of such other business as may come before the meeting. Transfer books will close on Saturday, November 8th, 1870.

WM. W. PARRISH, Secretary.

Office, room 7, Safe Deposit Building, 328 Montgomery street, San Francisco, California.

POSTPONEMENT.

Diana Mining Company.

The day of delinquency of the above assessment is postponed to November 17th, 1879, and the day of sale to Friday, the Fifth day of December, 1879. By order of the Board of Trustees.

J. T. McGEOGHEHAN, Secretary.

Amusements.

BALDWIN'S THEATER.

THOMAS MAGUIRE ..... Manager.
CHAS. H. GOODWIN ..... Treasurer.
J. P. CHAPMAN ..... Assistant Treasurer.

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Having complete arrangements with competent and reliable parties in Washington City, by which we are able to secure prompt and careful attention to law business there, we are prepared to assist Mill and Mine, Canal and Ditch owners in securing patents for their lands, mines and claims, in addition to our general line of patent business.

Many who are acquainted with the manner in which this business has heretofore been conducted, (with or without assistance by local attorneys), will see at once the great advantage of patronizing an establishment that is thoroughly organized and has its representatives in Washington to look after and prosecute their applications before the Commissioner of the General Land Office. The business on this Coast will be attended to personally by a member of our firm, and satisfaction will be given in all respects.

Correspondence from persons desirous of securing patents for Lands, Mines, Mill Sites, Canal and Ditch property, promptly attended to.

Applicants for patents for mining and farming land, whose claims have been delayed for any reason, will find it to their advantage to consult with us and in case of necessity secure the services of our home and Washington branch agency.

DEWEY & CO.,

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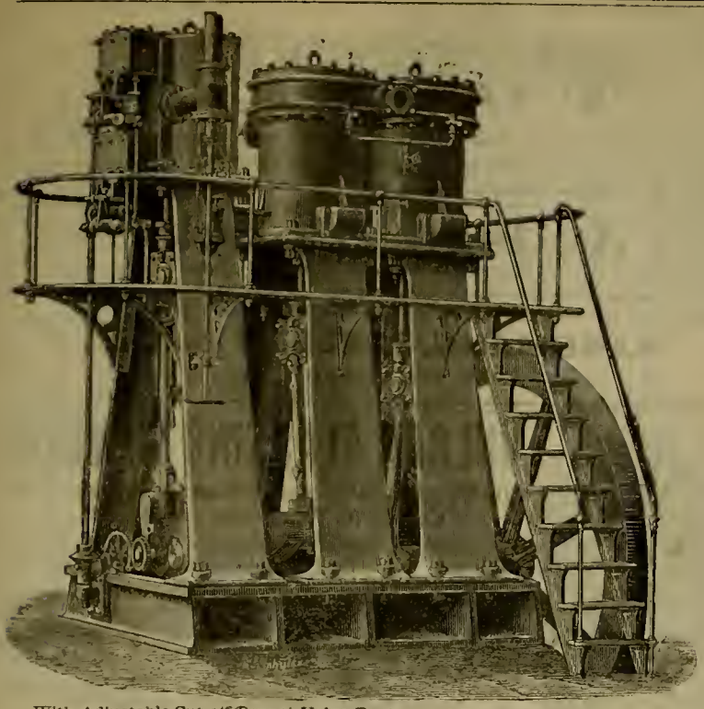

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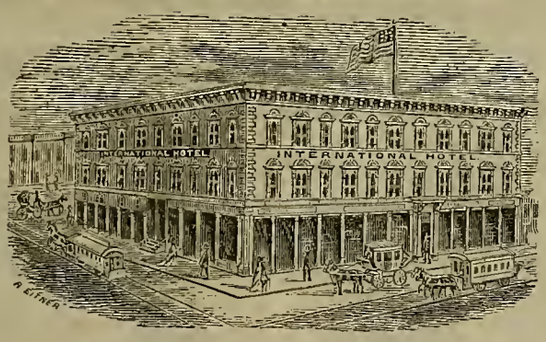

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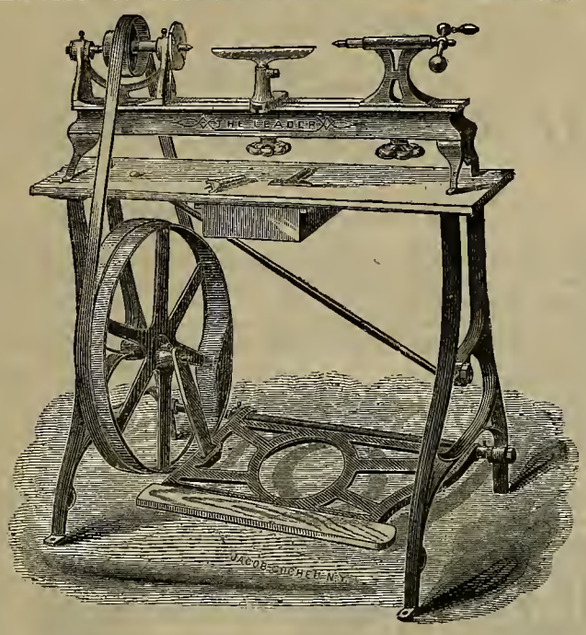

Material eighteen inches long and eight inches in diameter can be turned upon it. The pieces that accompany this Lathe without extra charge are two T rests, two plain centers, one spur center for wood turning, and one face plate.

Price of Lathe without Saw Attachments.....$45. Price of Lathe WITH SCROLL Saw Attachment.....$55
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Chuck for drills ½ and under, Price.....$1.50
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OFFICE OF THE

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Room 7, Safe Deposit Building, No. 328 Montgomery St., San Francisco, Cal., October 21, 1879.

At a special meeting of the stockholders of the above named Company, held this day, a Stock Dividend of 20 per cent. was declared, payable immediately, out of the capital stock owned by the Company.

All stockholders are requested to send their stock to the office of the Company before NOVEMBER 24th, 1879, and receive the dividend due thereon.

WM. W. PARRISH, Secretary.

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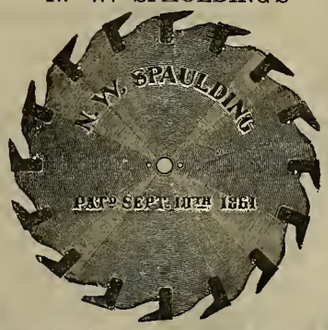

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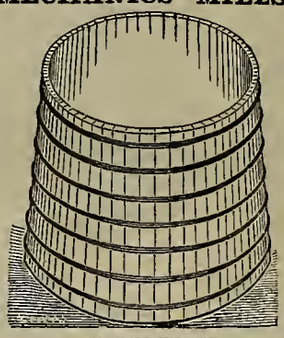

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, NOVEMBER 8, 1879.

VOLUME XXXIX Number 19.

More New "Processes."

The periodical excitement in the metallurgical "process" line is again under way. This time the particular localities attacked are Grass Valley and Meadow Lake, both well-known and prominent "bone yards" of processes, where many a one has come to an untimely end when brought to the test of experience on a large scale.

It is stated that a process is being worked by the well-known Murchie mining company, of Grass Valley, by which they have succeeded in reducing the base and rebellious sulphureted ore of one of their mines, by a simple method of amalgamation. The expense of the new way of treating the sulphurets is said to be $6 to $8 per ton, where the chlorination process, the best previously used, cost from $16 to $18 and higher. The Murchie is a large company, owning the Big Blue, Independent, Lady Alice, Red, White and Blue, etc., and having an 18-stamp mill, with 10 Frue concentrators, etc. The fact of a company of this character taking hold of the new process has given it a sudden prominence which it would not otherwise have had so soon. It is stated that they get 88% of both gold and silver. The inventor is James H. Smith, sometimes known among mining men as "Secor Smith," from a former connection with the Secor process. The new Smith process is kept a secret at present, and we know no more of it than that the Murchie company are supposed to be sending down bars resulting from a mode of working sulphureted ore by amalgamation instead of chlorination. It is not claimed to be the subject of any patent, so far as we can learn.

The principal excitement in this line, however, is at Meadow Lake, the rebellious ores of which district have resisted every attempt yet tried to work them. The district is a famous one; the ledges numerous and ores rich, but rebellious. A large town was built up there, mills erected, but the whole thing had finally to be abandoned through failure to treat the ores. Every now and again, however, when a new process comes to the front, it is expected that Meadow Lake will be started up again.

This time the local papers consider that the enigma is solved, and that there will be dividends, at least, from Meadow Lake ores. Numbers of people have gone to the district, and some expensive purchases of mines are said to have been made.

The process which has brought this about is one devised by Mr. James Gould, who was formerly at the Black Bear mine, in Shasta county. It is claimed that his method treats the ores which have defied all other processes. The Gould process, as described in the Truckee *Republican*, which is quite jubilant over it, consists simply in partially roasting the ore before crushing, then crushing it in a stamp mill; heating the pulverized mass to a cherry red in an ordinary furnace, and then amalgamating it by a simple pan process. In this way, it is stated, 13 tons of ore yielded $1,281.80, or nearly $100 per ton. Assays of tailings showed that $5.56 per ton of the gold escaped. If these figures be correct, it shows a saving of 95%.

We can see nothing especially new in the process as described above, the same treatment of ore having been tried before. Whether roasting the ore previous to crushing will make any difference we are not informed, but this has been done in several of the processes which have recently come to the front, but which have only appeared to disappear. We refer to those where ore was roasted and dropped into solutions supposed to put them into condition for amalgamation. This system was tried very many years ago, so that if practically successful on a large scale it would be recognized now.

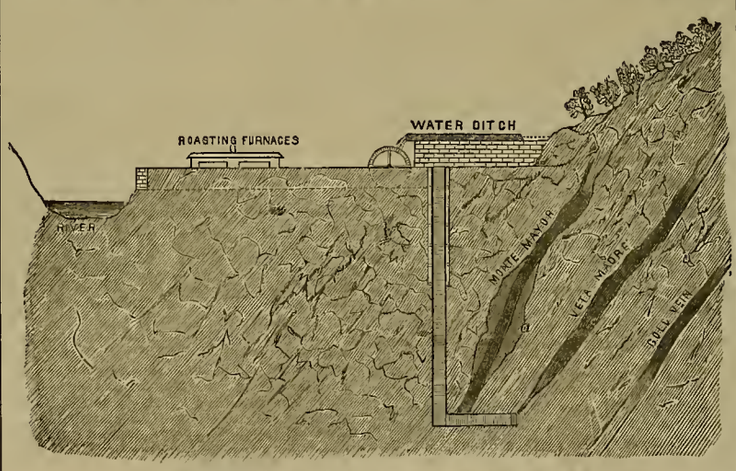
However, we have not heard that Gould wants anybody to buy rights for his process, or in fact, that he has or claims to have any patent, and he is entitled to a respectful hearing. If the gentleman has succeeded in doing what the local papers say that he has—and they ought to know, being close at hand—he will be doing a great benefit to the mining community, since a success at Meadow Lake will make a success at other places.

We should like, however, to see more explanations of the rationale of the process, and see wherein it differs from others which have gone before. No doubt the work already accomplished will stimulate the owners of the mines at Meadow Lake to test the matter thoroughly in a way which will be satisfactory to those directly interested, and to the public at large.

The Monte Mayor Mines.

In our issue of July 26th, we gave a description and map of the mineral district of San Salvador. Herewith we present a geological section showing the position of the veins in the Monte Mayor mine, in the district referred to, which is in the department of Golera, Central America. There are six mines belonging to the Monte Mayor mining company, of which the Monte Mayor is the most important. The mines were owned for some time by Manning & Co., of Liverpool, who had advanced money on them, but they are now owned by the company referred to.

The shaft shown in the engraving is full of water, and has been for some time, but a steam pump will be sent from here on the 20th, by which it will be pumped out. The Monte Mayor consists of three veins parallel or rather converging towards each other, respectively five, seven and two feet wide.



THE MONTE MAYOR MINE, SAN SALVADOR.

It is stated that at *A* is an excavation in which very rich ore was found, native silver hanging on the walls and in the fissures of the cavity. The vein matter on an average paid about 64 ounces per ton in gold and silver, in the proportion of four to six, or about $129 per ton. The shipping ore was up to $1,000.

The water-wheel is an iron one, brought from England, and by means of the creek, furnishes water power for the arastras during five or six months of the year.

The permanency of the San Salvador mines generally, is proven by the Loma Larga mines, the Tabanco, Esqueutros and Corozal, all of which have been producing metal continuously for over 15 years. The district is very little explored. The climate though tropical is nevertheless quite healthy. Mr. Guido Kustel has examined and reported on these mines, and the company who has secured the mines and now about to work them are nearly all San Francisco people. The ore has previously been worked by arastras, but a mill will shortly be sent down. Some of the ore was brought to this city and worked with very satisfactory results.

THE furnaces in blast in Scotland now number 90, as compared with 96 at the same time last year. These produce about 195 tons weekly per furnace.

Why do Springs and Wells Overflow?

A new theory in answer to the above question is broached by Nelson W. Green in the *Popular Science Monthly* for November. Mr. Green says the overflow is caused by "the resultant of the earth's centripetal and centrifugal forces acting impulsively upon the subterranean water deposits, and tending to force them into and through the natural channels of the earth's crust." It is claimed that while the overflowing of wells and springs has been accounted for by scientists upon the supposed existence of hydrostatic pressure, a more careful investigation justifies the conclusion that such a proposition is fallacious, although exceptional cases may occur. Aristotle and Seneca suggested the central heat of the earth as the force which operated to compel the water to seek an overflow, but this is not borne out by experiment, neither is capillary attraction a satisfactory explanation. The controversy, if any there be, is confined to those subterranean waters of the earth which are not influenced by rains.

Among the many examples cited against the hydrostatic theory, and in support of the centrifugal and centripetal forces, Chautauqua lake is mentioned as being situated on the highest land in the State of New York west of the Catskill mountains, without any adequate feeder. Yet a large mill stream issues from it; in fact, the lake is 20 miles long by two miles wide, the whole body of which is fed by springs bubbling up from the bottom of the lake. The whole mountain region of northern Pennsylvania is referred to as another good illustrations of high springs, which are claimed to be beyond the reach of hydrostatic pressure. The White and Adirondack mountains are also full of similar cases.

It is generally held, according to M. Garnier, that "unless there be a reservoir higher than the surface whence we intend to bore, we cannot hope to obtain an overflowing fountain." Instances may be multiplied to show the fallacy of this assumption. The Himalayas, the highest mountains in the world, pour continually out of their highest points great cataracts and streams, with an abundance that would exhaust any possible reservoirs at their extreme tops. Now since this is the highest land of the world, no higher source is possible, and hence the conclusion is inevitable that these great overflows are due to some other force than hydrostatic pressure. That gases may force water up may be shown to be erroneous, for the reason that gases do force water down when both are enclosed by a common receiver. This, says Mr. Green, may be seen any day at the gas-works. But he omits to explain the action of carbonic acid gas, etc., in soda fountains, fire extinguishers, etc., which invariably throw the water in any direction in which the nozzle may be pointed. Mr. G. supposes in the case of water imprisoned in the rocks, that the resultant of the two natural forces, centripetal and centrifugal, are duplicated upon every point of the inside surface of the rock prisms, and tends to force the water out when the cavity is perforated. The direction of this force is placed at 45° from the direction of the force of gravity, but it remains unimpaired should the opening lead in a contrary direction. Hence, if fissures exist in rocks that lead to imprisoned waters, it would happen that through these outlets the waters must certainly flow, and, if by any artificial means, as by boring, an opening should be made between a body of confined water and the surface of the earth, a flowing well would result. "Of course," says the writer, "it must not be understood that this would happen if the body of water supposed were an isolated one and completely unconnected with other bodies of water through channels and intercommunications known to exist in the various ramifications of the earth's surface." Why should it not if the theory be correct? If the two natural forces referred to are continuous upon a string of subterranean reservoirs, why should they cease to operate upon an isolated one? If it be necessary in support of the centripetal and centrifugal theory to create a vast series of subterranean reservoirs connected with each other, there can be no necessity for the theory, since hydrostatic pressure can explain the phenomena of water flowing from the tops of the highest mountains under a similar arrangement. Nay, a common force pump in the hands of a man can overcome the Garnier theory, and why not the immense forces of nature?

It is true that the centrifugal force tends to throw particles from the earth, but the centripetal force tends to the opposite, and both being equal, the effect is the same as if neither existed. Otherwise, it would seem as if the resultant of the two forces, being more powerful than either one alone, would affect other things in or upon the earth. There may, however, be reasonable grounds for suspending the operation of gravity or centripetal force, to a certain degree, to explain the overflow of springs and wells, which cannot easily be explained by hydrostatic pressure, for it is certainly true that strong and abundant overflows occur at the tops of mountains and on high plateaus; and admitting that hydrostatic pressure causes the overflow of springs and wells in particular localities, it would still be necessary to explain how water gets to these highest points. Mr. Green says this can best be done by his theory, in which the force is always acting upon partially confined water-beds and water-channels forming the internal water-structure of the earth's crust. The conditions necessary to the realization of the best results are that these water-deposits shall be more or less imprisoned and the outlets comparatively limited. The overflow will be continued and upward until the resultant is overcome by friction. We are hardly prepared to accept this theory without further investigation, for one reason of many, because friction does not overcome the resultant in very deep *flowing* wells, while in shallower wells the water, although abundant, does not rise to the surface, whereas the contrary would seem to be the case, the resultant having less friction to contend against.

CALIFORNIA GRANITE QUARRIES.—At Penryn, Placer county, the granite quarries of Mr. G. Griffith are working a force of from 50 to 200 men. The granite is quarried at a depth of about 100 feet below the surface, and is taken out in blocks of from 10 to 40 tons. This granite is considered of very superior quality, containing less iron than the Eastern varieties, and as to polish, it is *par excellence*, as the many buildings in this city will testify, particularly the polished columns of the Stock Exchange. Mr. Griffith has also a quarry of Black or Egyptian granite, from which the handsome buttresses for Mr. Flood's residence at Menlo Park were made. A bid has been put in by the proprietor for building the Oakland Masonic Temple of granite from this quarry.

IT is stated that Gen. Sherman has written to a military friend in Chicago, that Gen. Grant has an important message to deliver to the people of the United States, which he will give to them first when he reaches that city.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

El Dorado County Mines.

EDITORS PRESS:—I see in my last letter, in writing about the Sardine mine, on Main Bar, American river, owing doubtless to my careless caligraphy, the Superintendent's name is printed Session, it should have been Mr. Thomas Simons, a gentleman well known in the mining world, both in Colorado and Nevada.

Golden Ophir.

Since my last I have visited this mine, but unfortunately on the day of my visit the mill was not at work. Mr. Folger, the Superintendent, informed me that the new machinery moved highly satisfactory, and the ore from assay tests was most promising. I am told that recent assays gave a return of between $400 and $500 a ton in silver. Mr. Hobart, who made tests of the ore by the new Robertson process last summer, found the sulphurets to be very rich, and made the company an offer to put his sulphuret-saving machinery below the Huntington riffles, as they now exist, but his offer was not accepted. Until I have an opportunity of seeing this mill in operation I shall refrain from writing about it, beyond saying that, admitting it to be all that is claimed for it, I doubt its capacity to work a sufficient quantity of ore in a given time, to be remunerative, especially as the slate neither works nor discharges from the screens as freely as quartz does, and being so much thicker in the pulp requires an extra amount of water, thereby retarding the settlement of the sulphurets. I am satisfied that with really efficient machinery, adapted to the peculiar nature of the ore, the "Golden Ophir" will prove a valuable property, and fully justify Colonel Bilty's persistent efforts to develop it.

The Argonaut.

This mine, situate some one and a half miles south and three-quarters of a mile east of the village of Greenwood, a lively and prosperous mining camp, even yet, owing to the many mining locations which centralize here, is now being thoroughly explored and prospected by a San Francisco company, Hon. Paul Neumann & Co., who some time since bonded it from the locators, Messrs. John and Thomas Smith, Maltby and Garcia, who had partly opened the mine, and erected a ten-stamp mill thereon. The present company have worked no ore in the mill, but have been several months at work in thoroughly opening the mine. On the surface the lode measures 64 feet in width, which led to the opinion of some experts, that it was a mere mass of float ore. The new company have run a tunnel, now in over 400 feet, to tap the supposed ledge, at a depth of 200 feet below the surface, and in doing so, have passed through a quartz ledge, 39 feet thick, showing handsome prospects of free gold, visible to the naked eye, with well-defined walls; a second ledge, upwards of 8 feet in width, which also prospected well; and they are cutting through a third ledge, which is now penetrated for 43 feet, and how much more there is to be cut through remains for time and powder to develop. That this is a mother ledge is certain, and if the whole body of ore will pay for reducing, even if of a low grade, this will make a permanent and profitable mine. It is evidently in the right hands, and Mr. McNevins, the well-known mining engineer, has spent all this summer directing the prospecting in it, as well as attending to other mining property in this county. The success of this mine is important to this section, both as to the impetus it will give to business generally in this neighborhood, and stimulating capital to seek other investments in the numerous locations that await its aid both here and in other parts of El Dorado county.

The Golden State Mine,

Owned by a private company, consisting of Messrs. Armstrong, Hall, Jones, and another gentleman whose name I forget, is situate on Jones' creek, some seven miles from Greenwood, on the north side of Canyon creek, near the village of Jones' Hill. This mine is more of a series of seams than a lode; has been steadily worked for many years, and has always been a profitable mine; nor is there any indication of its ceasing to be so for many more years to come.

The Clipper Mine.

Mr. E. W. Hulford is now engaged in opening the Clipper quartz mine, some 3½ miles above Georgetown, for a San Francisco company. Rich ore has formerly been taken from this mine, when in the hands of private parties, and under the management of Mr. Hulford there is every assurance of its being added to the list of successful investments in mining property in this county. Renewed activity in the various quartz mines around Georgetown is one of the indications of increasing confidence in our mineral wealth, which in the near future will not be confined to gold alone, as old "El Dorado" can boast of good copper deposits, slate and asbestos. Cinnabar also exists, but whether sufficiently rich to be profitable remains to be proved. That slate of fine quality exists is a known fact, but it can only be utilized when increased population and improved facilities for transportation shall have enlarged the demand and reduced the expense of removing from quarry to market.

Mineral Lands.

I see that Mr. Dana Perkins, a land agent for the C. P. R. R., urges the necessity of compelling miners to prove up on their locations, and of forcing all land not actually in use for mining into the market, especially all such land as has been allotted to the railroad corporation. Such a consummation would most certainly be very detrimental to the future prosperity of this county, teeming as it is with mineral, which, if locked up in private hands, would practically stop the nomadic race of prospectors, the pioneers of all mining developments—men who spend their lives looking for a strike, almost invariably poor, and yet ever the discoverers of lodes and deposits for the ultimate benefit of others and enrichment of the State. As an old prospector told me a few years ago, when I met him, after twenty years of toil in the mining camp he was then leaving, with his blankets on his back: "Yes, I'm off for El Dorado, Amador and Kern counties. There are too many clothes lines and fences here now for me, and a fellow can't prospect any more without trespassing on some fellow's poison oak ranch. I've done well here at times and opened several good mines, but I'm broke now." D.

Greenwood, Oct. 27th, 1879.

Fire-Proof Rock in California.

EDITORS PRESS:—Many years ago a stratum of peculiar clay was discovered near Milwaukee. It is from which a kiln of bricks were made as an experiment. They proved of a yellowish color and were unsalable. In the lapse of time it was noticed that wherever those yellow, worthless bricks had been used in connection with limestone in the construction of furnaces, the bricks were as uninjured by fire as were the limestones—till then the principal reliance for furnaces, forges, chimney-backs and the like.

At once the old dis-used clay-bank was revisited, large kilns of brick put up, and the city of Milwaukee had a near and ready source of great wealth.

Soon the Milwaukee fire-proof brick were in demand all over the States, and Canada; nay, more, were shipped across the Atlantic and around the Horn. Most of the steamer furnaces, hotel furnaces, mining and smelting works of the Pacific coast have been built with Milwaukee bricks imported at a cost of about 10 cents apiece!

Now, right here in Sierra county Cal., a ledge of rock exists that is singularly unaffected by the intensest heat and the most sudden plunges into cold water thereafter, though repeated any number of times. The ledge is stratified just right for quarrying, water power is abundant and right at hand, in fact, crosses the ledge. No dan, even, is necessary, only a short flume. The rock is soft, yet tenacious, admirably adapted to sawing into blocks as desired.

A stage road passes within a few rods of the ledge, and the C. P. R. R., is but a half-day's drive away.

This fire-proof rock can be fashioned to suit, and laid down on the wharves of San Francisco, on the depots of the mining towns of California for one-quarter the cost of imported bricks, while in many respects it is 10 times better, as large blocks or peculiar shaped ones can be made at pleasure, thus saving expense of mortar while securing greater strength and durability.

What enterprising man or firm will take hold of and develop the new source of wealth? Consider what Milwaukee bricks have cost this coast, and, if this fire-proof rock is equally as good, it is easy to see that "there is millions in it." J. G. LEMMON.

Sierra Valley, Oct. 22d, 1879.

Globe District, Arizona.

EDITORS PRESS:—In my last communication I made an assertion that I thought that there was here a fine opening for investments, and in order to show the public how it is, will give an outline of one which I have visited and examined, and tell what I saw. This property lies only one-quarter of a mile from abundance of water (Pinal gulch), and on its surface shows croppings of large width and at the shaft we find pay ore at least four feet wide. The shaft was sunk 40 feet through the hanging wall, and at that point cut the vein, showing pay ore three feet thick. The shaft was then put down 60 feet, following the footwall, making a total depth of 100 feet. In the bottom there was found 18 inches of extremely rich horn silver ore, which glistened and sparkled in the candle light like diamonds. Now, back to the surface and on the dump, we find no trouble to get ore assaying up into the thousands. We go out to the croppings and follow them northeast for 90 feet to end of claim and find they carry ore, and in places even eight feet wide and crossing the line three feet on adjoining claim, find a shaft 25 feet deep, showing good ore. At the bottom find workmen drifting southwest to dividing line, and here we find three feet of rich ore.

Having now examined enough to form an idea, will see what the terms of the owners are, which are these: They ask for a body of ore 3 feet wide, 25 by 40 feet deep on ends and 90 feet long, all of which is in sight, and place the price at the value of the small sum of $50 per ton, leaving out all ore in the 60-foot shaft, also supposed body unexplored southwest of shaft, which has as good experience as the northeast side. Then another item, lying on the north of the ledge are several strata or spurs. Two have been prospected and carry ore from six to eight inches wide, out of which can be got assays of immense value.

Now, having facts and figures before us, I would ask where and by whom is there any such inducements held out to investors, and this is only one of a great many properties that are offered at such prices. I think the amount of ore, as well as price, at a large per cent. below actual value. So looking at all sides I fail to see how an investor can fail to realize a handsome profit, for as depth is reached these spurs must connect with and make the ledge that much larger, as well as richer. Now, as the question may arise in the reader's mind, if these parties have all this ore, why do they wish to sell, and I will answer. The only means of reduction here at the present time is a five-stamp mill (the Isabella), and their terms are $25 and $45 per ton, guaranteeing but 80% of assay, so you see the inducement held out to those having low-grade ore.

In my other I tried to show that, with machinery here, ore ought to be worked as cheap, if not cheaper than in most camps, under as good management; and these two claims are not the only ones on this ledge, for it is traceable for about six miles in length, and having all indications of permanency.

Having now given you an idea of some of our low-grade ore, will cite you to the returns of the Isabella mill, commencing August 26th and ending September 30th. During that time there was worked 180¼ tons, giving a gross yield of $50,047.50, or an average of $277 per ton of 2,000 pounds. This was taken from 19 different mines, showing we have a goodly amount of high-grade ore. MINER.

The Lick Observatory.

The *Science News*, speaking of the above observatory, points out the value of the California climate for favorable astronomical observations. It says: During the last four years, very little has been heard of the observatory to be built in California from the gift of Mr. James Lick, and the public has very generally supposed nothing would come of the project. But there are now signs of a renewed activity on the part of the trustees, and evidence of an intention to carry the project through without further delay.

In August last, Mr. S. W. Burnham, of Chicago, the well-known observer of double stars, was invited to spend a month or two on Mount Hamilton, with his telescope, in order to test the suitability of the mountain as a site for the proposed observatory. His reports were so favorable that Prof. Newcomb, on whose recommendation he was chosen for the work, visited the place himself in September. Both these gentlemen speak in the highest terms of the excellence of the astronomical conditions. Not only is almost every night perfectly clear, but, according to Mr. Burnham, bad seeing is almost unknown. Every night is such a one as he would consider superb at Chicago, and would only meet with two or three times a year. He discovered during his stay a number of new double stars, in portions of the sky which are further south than can be thoroughly examined in the comparatively bad atmosphere of stations this side of the Mississippi.

The result of this exploration will give both the trustees and the public a new interest in the project, and it is supposed will lead the former to push the work on as rapidly as possible. If, as both the astronomers who have examined the site seem to suppose, its atmosphere is finer than that of any existing observatory, the result will be that the most powerful telescope in the world will be under the finest sky for supplying its utmost capacity.

PUSHING AN IRON BRIDGE ACROSS A RIVER.—A notable feat in engineering was brought to successful issue in the latter part of September, at Dinard, in the department of Ille and Vilaine, France. In carrying a railway across the river Rance, the novel plan was adopted of building the bridge on shore and boldly pushing it bodily across the stream. The bridge weighed 2,600,000 pounds; its hight above the river was 100 feet, and the length of the main span 314 feet. Twelve windlasses were used in rolling the bridge into position. It was calculated that four or five days would suffice for the work of putting the bridge in place, but owing to the breakage of chains, it took two weeks.

KRUPP OF ESSEN.—The cast steel manufactory at Essen has existed since 1810. It has been conducted by the present owner, Herr Alfred Krupp, since 1826, and since 1848 for his sole account. The number of workmen, at the close of 1878, was 8,500. There are in these works 1,648 furnaces, 77 steam hammers—the largest of all weighing 50 tons—18 trains of rolls, and 1,062 machine tools.

Tombstone District, Arizona.

The *Weekly Nugget*, published at Tombstone, Pima county, Arizona, in its last issue gives the following account of the surroundings of the above district.

To the south of us, a distance of 15 miles, by prospectors' trail, lies the Mule mountains, having derived their name from the pass in that range which is only traversable by loose or pack animals—mule pass—and over which rail most of our smuggled goods are brought in. These mountains, or the mining section therein, cover a space of about 15 miles square, perhaps not as far in an east and west direction, but about that north and south. The country is located for mining purposes from the north end of the pass through the entire range, for a distance of 15 miles. On the north the mines show both gold and silver, the gold predominating, and in the center copper is found in enormous quantities, so much so that flux in sufficient amounts is hard to obtain. At the south side, and about 15 miles from the Mexican line, lie the silver claims from which such good reports have recently been received, and which contain a vast amount of that metal and will, sooner or later, produces a stir among our mining people. As is too general, this district is classed as "low grade," which is not the case; the ore generally assaying into the hundreds, and which by proper treatment would yield large profits to those who invest in reduction works. The San Pedro river lies from seven to eight miles from these mines, and furnishes abundance of water for all milling purposes, and, in fact, is less distance than is usual for mining companies to transport their ore. Water is scarce in this camp, except about Dyer's camp, where persons traveling that way, find a hospitality which is more than unusual in frontier countries.

From Mule mountains to the northeast, but little prospecting has been done, on account of the scarcity of water. From persons who have been through there, we learn that many large leads, of unknown value, have been seen. These claims have not been located from the fact that these parties were "thirsty," and seeking a more congenial spot for themselves and animals. The route is almost level to the Swisshelm mountains, in which the St. Louis company are now putting up their mill for the reduction of the ores from the valuable mine—Swisshelm—which gave name to that group of hills. From Swisshelm's Camp, Rucker is the supply point for provender and is very convenient, while the necessary lumber for building purposes can be had at Morse & Co's mill, in the Pinery canyon, close at hand, and which mill is now engaged on a contract of two or three hundred thousand feet for the before-mentioned St. Louis company. This mill is distant some 15 or 18 miles from Camp Rowie, and the once dreaded Apache pass, and about 20 miles south or southeast from Dos Cabezas gold mines, which point is attainable by the stages of the National Mail and Transportation Company, running between Tucson and Mesilla, N. M.

Dos Cabezas district, as defined by the records, is a gold district, and covered by from 100 to 200 claims, and from which a great deal of bullion has been produced, and could be now, if the necessary appliances were at hand. E. Martin Smith, of whom everybody knows, and P. W. Smith, of the Pima County Bank, are largely interested here, and, in consequence, these valuable "diggings" cannot lie idle long. From Dos Cabezas to the northwest lies what is known as the silver district, and where many claims have been located, producing enormous assays in silver, but upon which little work has, so far, been done, except the title assessment work. Further on from this point, and, in fact, all the way to Camp Grant, is a country filled with mineral, but is, as yet, almost unknown to the prospector, and which so far as has been traveled, is known to abound in silver ores.

However, there are miles of promising country closer about us. Commencing at a point about Tres Alamos and following down the San Pedro for a distance of, say 25 miles, and branching off to the east as far as the stage road, is a country which undoubtedly contains gold and silver, and which has never been looked at by our experienced prospectors. Considerable ore brought from there by passers-by resembles that of the Tough Nut of this camp, for silver, and some "horn-spooned" specimens have shown a fine prospect in gold. Farther down the San Pedro are the mines which have already created their commotion, and which are known to be more than good. These all lie on the east side of the river. On the opposite side—the Santa Catarinas—is supposed to be a group of mineral, in fact, many mines have already been located and give promising assays. This range has hardly been touched by prospectors, from the fact that none who are able have ever discovered and worked a "bonanza."

A STRONG BANK.—The Bank of England was incorporated in 1649. It covers five acres of ground and employs 900 clerks. There are no windows on the street; light is admitted through open courts. No mob could take the bank, therefore, without cannon to batter the immense walls. The clock in the center of the bank has fifty dials attached to it. Large cisterns are sunk in the courts, and engines in perfect order are always in readiness in case of fire.

MECHANICAL PROGRESS.

Moving the Egyptian Obelisk.

Lieut. Commander Gorringe, U. S. N., and his assistant, Lieut. Schroeder, have sailed for Liverpool, on their way to Egypt, to superintend the removal and shipment of the Cleopatra Needle presented by the late Khedivo to the city of New York. The machinery to be used in handling the monolith has been prepared at the Roebling Works, Trenton, under the direction of Mr. Gorringe. The *World* says that this machinery will aggregate about 80 tons in weight. It consists of two towers, each 26 feet in hight (which are to be shipped in sections and put together after their arrival in Alexandria), two steel castings, each weighing over six tons, and a cradle 60 feet in length. The towers correspond to the sides of a gun carriage, and the casting to the trunnions on a gun. Like the machinery for handling the monster gun of the colossal Italian ironclad *Duilio*, this machinery for moving the Alexandrian obelisk will command the critical attention of machinists and engineers; and it is satisfactory to know that the work of transferring to the New World this great Egyptian monument will be carried out entirely under American auspices.

The method of embarking the obelisk is described as follows: A steam collier having a water ballast compartment will be secured alongside of the pier, and the necessary preparations made for heaving her down to careening lighters placed alongside on the side opposite to the pier. The water ballast compartment will be filled. A port having been opened to admit the obelisk into the fore-hold, it will be launched in. The listing of the steamer from taking its weight will be overcome by heaving down on the careening lighters, and the sinking due to both operations will be counteracted by pumping out the water ballast compartment, thus removing a weight of water corresponding to that of the obelisk. Tidal and wind-drift differences of level will be overcome by means of a float secured at the shore end after the fashion of a ferry-slip.

Compressed Air Filter.—A new filter has been devised by M. Chanoit, which works on the ascensional principle, and in which the filtered water is made to compress air and so become itself aerated. The purifying medium used is a preparation of iron slag from blast furnaces. The pressure of the main or other source of supply forces the water upwards through the filtering material, the supply pipe to the filter being reduced so that the pressure is brought on slowly and gradually, in order that the filtration may not be too rapid. The air contained in a reserve or storage chamber is compressed by the pressure of the water rising in it, and this compressed air serves to aerate the filtered water, and subsequently assists in giving force for its distribution to the upper stories of a building or wherever it may be required. The filter casing is made of galvanized iron, neatly painted outside, and fitted with nickle-plated draw-off, distributing and cleansing taps. The filters are made in various sizes, to filter any quantity from one quart per minute upwards. The filter is self-supporting, and can be easily connected direct to the main service pipe, or to a cistern or tank fixed at a greater elevation than the apparatus itself, so as to get the necessary force to feed it. The manufacturers adopt a modification of the arrangement for fixing in cisterns or large tanks for railway stations and other large establishments. The following are the advantages claimed for this filter, viz: That it is self-supplying and almost self-cleaning, the operation being performed very rapidly; and that by means of this apparatus, pure and aerated water can be supplied to every floor of the largest houses, in town or country. The filtering material does not require to be renewed so frequently as in other filters, but will, it is said, remain in working order for years, and will not foul the water, however long it may remain in contact with it.

Connecting-Links for Chains, Etc.—The following method of constructing chain-links is suggested by Herren S. & M. Rosenberg, of Cassel: A link, similar in form to that of an ordinary chain-link, is split or divided into two separate parts at a slight angle to its two flat faces, so that each part is somewhat thicker on one side than on the other. On the thicker side of each half is an undercut projection of a thickness and form corresponding to that of the tranverse section of the complete link, and on the other side there is a gap or opening corresponding exactly with such projection, so that when the two halves are slid on to each other, the projection on the one half fits into the gap of the other half, and thus the two halves are secured firmly together, the ends of the gap of the one part being dove-tailed so as to fit into the corresponding dove-tailed ends of the projection on the other part. For securing together the two ends or parts of a chain, or the two eyes or loops of a rod or bar by means of this link, the two halves are first separated, and the links to be connected having been inserted through the gaps thereof, the halves are slid together as described, whereupon they will securely hold the chain until again slid apart by hand.

A Remarkable Railroad.

The Mount Washington railroad is a marvel of engineering. It is three miles in length, and rises 8,625 feet, or one foot in four. The principal feature of the railroad is the cog-rail in the center of the track. On each driving-shaft of the engine is a cog-wheel. The teeth catch the cogs in the center rail, propelling the car up the mountain. The boilers of the engine are inclined downward, and when on a steep grade are quite horizontal. Every locomotive takes one car, and is provided with a double set of driving-wheels, that any danger from breakage of machinery is prevented. The ascent requires one hour and a half, and one could step off and on at any point. The track is strongly built, and is daily inspected by the men continually employed to police it. In ascending, persons in the forward car have their feet on a level with the heads of those who sit aft near the engine, which, going up, is the propelling power, and going down, the repelling force.

The steepest point is Jacob's ladder, a trestle 30 feet high and 300 feet long, the grade 1,604 feet to the mile, or thirteen and one-half inches to the yard.

Improvement in Ships.—A nautical invention has recently been brought out in France. The invention consists in forming the upper portion of the bulwarks of ships, of loose sections, composed chiefly of hollow, thin metallic tubes, divided into compartments by diaphragms, the sections to be about 12 feet long; these are to be divided into a number of compartments of suitable form, and provided with projections on their under sides, so as to be fitted on to the place of the top rail of the bulwarks, serving as a substitute therefor. These sections, when immersed in the water, would form so many pontoons, and, being provided with cords and loops along their sides, would, in the event of the ship going down, be lifted out of their place by the action of the water. It is likewise proposed to construct the seats on the deck in the same manner, and underneath every seat, and along the entire length of the bulwarks, other floating tubes may be provided. In the case of sea-going vessels, the bulwark tubes are fitted with holes, rings or slots, so that in case of foundering they can at once be joined together either before or after taking to the water.

Improved Method of Lubrication.—In a recent French invention the screw is applied to lubrication of shafts and other parts of machinery. In the case of a shaft, the oil is poured into a reservoir below, and a screw placed slantingly in the tube raises oil to the level of the shaft, whence it is distributed by channels over the breadth of the journal. The axis of the screw rests on the bottom of the reservoir, and its head turns in a bearing fixed in the tube. Motion is communicated to it from the shaft by means of gearing with helicoidal teeth. The impurities at the bottom of the reservoir are neither stirred nor carried up. The velocity of the screw is adapted to the lubrication required. If the shaft has a high velocity that of the screw is diminished, since the shaft is subject to slight pressure; but if the shaft turn slowly, the velocity of the screw is increased, so as to raise more oil because of the strong pressure. Thus a regular, continuous and economical pressure is obtained.

Portable and Traction Engines.—The following method of constructing the carriages and brackets for carrying the crank-shafts of engines of this class is adopted by Messrs. Clayton & Shuttleworth, of Lincoln. The bracket is firmly bolted on to the boiler, and on this bracket is mounted the carriage, which is secured from lateral movement by a tenon fitted in a mortise or groove in the bracket, and from vertical movement by flat-sided bolts, which pass through the tenon and the sides of the groove in the bracket. These bolts tightly fit the respective bolt-holes, except at the part where the bolts pass through the tenon, at which place the bolt-holes are made longer than the width or diameter of the bolts, thus allowing the carriage to slide longitudinally on the bracket as the boiler expands or contracts, whilst at the same time the distance from the cylinder to the center of the shaft is preserved by a stay, in the usual manner.

New Damping Apparatus.—Mr. William Mather, of Salford, county of Lancaster, England, has patented an improvement in apparatus for damping woven fabrics by means of a spray or sprinkling of water upon the fabric after starching or stiffening. It consists of a damping roller made of metal, with an engraved surface. The damping roller revolves in a trough containing the water, and a doctor, of India rubber or other suitable material, is applied to the damping roller to remove the excess of moisture. The fabric or other material is pressed against the damping roller by a roller supported in a swing frame.

New Mining Sluice.—Mr. Samuel M. Eddy, of Dalton, Ga., has patented a simple, easily operated, and efficient apparatus for washing gold from the dirt, stones, etc., with which it is mingled. It consists of a rectangular trough provided with gates, bars, or bridges, intervening pockets, and zigzag ribs or bars, for obstructing the material and supplying places for receiving and retaining the precious metal as it gravitates from the gold-bearing dirt or sand.

SCIENTIFIC PROGRESS.

Corrosion of Boilers by Fatty Matters.

The Chief of the Experimental Railway Company of France, M. A. Mercier, gives, in the *Annales des Mines*, the results of some experiments upon the changes produced by fatty matter in the wrought and cast-iron parts of engines exposed to the action of steam. M. Mercier had occasion to examine in the laboratory some hard balls taken from the cylinders of steam engines, and which were generally attributed to the use of acid lubricating oil. The balls, when crushed and digested in ether, left an insoluble residue of peroxide of iron, while the soluble part was composed of oleic acid, combined with the oxide of iron mixed with a non-decomposed oil.

A series of experiments was made to determine whether the formation of this oleate of iron resulted from the use of oil more or less rancid, having an acid reaction, or whether it was the product of the decomposition of neutral fatty matter in presence of iron and of steam at a high pressure. According to these experiments, the fatty matters have no need of being acid or rancid, nor of being heated above 212° F., to decompose steam in presence of iron, and thus produce oleate of iron, glycerine and hydrogen. Observations made upon steam engines which showed corrosion in those parts exposed to oil and steam, suggested the following experiment: An iron bucket containing wrought-iron chippings, thoroughly saturated with oil of colza previously neutralized, was left during eight days in a reservoir supplying steam to several steam hammers. At the expiration of this time there were taken from the bucket about 30½ cubic inches of very thick oil, which flowed with difficulty and emitted an odor similar to what is produced by the action of an acid on iron; the iron was strongly corroded, and the oil—colored to a dark brown and entirely soluble in ether—contained 7% of the oxide of iron. This oleate of iron oxidized rapidly on contact with air, and, like all the minimum salts of iron, gave up some peroxide of iron; when again placed in contact with iron it attacked the iron and was thus brought back to its first state of saturation. In this manner can be explained the large proportion of non-combined peroxide of iron contained in the matter found on the valve-face of an engine at Valence, upon which an observation was made.

These facts appear to clearly explain the corrosions of certain boilers receiving fatty matters brought over from the cylinders by the exhaust steam, or used to lubricate the throttle valve of locomotives.

In locomotives the steam is generally taken from the upper part of the boiler by means of an immersed slide throttle valve; the oil used for lubricating the latter becomes saturated with iron, and being thus made heavier than water sinks to the bottom of the boiler where it attacks the iron plates, forming in them those excavations which are only found when feed-water is used of such purity as not to deposit the lime-scale that in most cases preserves the boilers.

The use of mineral oil, thickened if necessary with wax or paraffine, for the lubrication of moving parts placed in the steam, would be without doubt a good means of preventing changes in the material of such organs.

The Rain Tree.—Some travelers in Columbia, South America, in traversing an arid and desolate tract of country, were struck with a strange contrast. On one side there was a barren desert; on the other a rich and luxuriant vegetation. The French Consul at Loreto, Mexico, says that this remarkable contrast is due to the presence of the "Tamai caspi," or the rain tree. This tree grows to the hight of 60 feet, with a diameter of three feet at its base, possesses the power of strongly attracting, absorbing and condensing the humidity of the atmosphere. Water is always to be seen dripping from its trunk in such quantity as to convert the surrounding soil into a veritable marsh. It is in summer especially, when the rivers are nearly dried up, that the tree is most active. If this admirable quality of the rain tree was utilized in the arid regions near the equator, the people there, living in misery on account of the unproductive soil, would derive great advantages from its introduction, as well as the people of more favored countries where the climate is dry and drouths are frequent.

Origin of Language.—A Frenchman named Clairefond has published a small work in which he revives the argument that the earliest attempts at human speech were imitations of natural sounds or the cries of animals; and he contends that out of recollections and repetitions of these sounds the names of certain natural phenomena, and of animals and other objects, originated. He finds numerous examples in the French language, and thinks that proofs might be found in other languages if search were made, and suggests that the Geographical Society of Paris might furnish instructions to their travelers to collect from among the natives of different countries all the sounds traceable to the source indicated above. M. Clairefond is of opinion that the series of sounds, words and expressions thus collected would aid in the discovery of the origin of language. Taken in connection with natural sounds, the origin of words in our own language—such as thunder, sigh, whisper—becomes evident.

Bog Ores.

The roots of trees appear to have power to reduce the peroxide of iron, contained in sands with which they come in contact, to the soluble protoxide. When the water which dissolves this runs into low places, where branches, twigs and leaves of trees are slowly decaying, the protoxide becomes reoxidized and is deposited in the interstices of the vegetable forms left by the decomposition of the woody fiber. Thus, parts of the trees are not petrified, but ferrified; and whole beds of iron ore consist of these roots of dead vegetation. Where the ferruginous waters do not encounter masses of decomposing wood, but merely lie at rest, as in swamps and ponds, the evaporation causes the ore to be deposited in lumps, from the size of a shot to five hundred pounds weight. From the bottom of ponds these lumps can be raised with tongs, like oysters. In either form the large amount of vegetable matter which this ore contains makes the melted iron reduced from it exceedingly fluid, so that it runs into every nook and cranny of the casting mold, and reproduces it with sharp and precise outlines. When bog ores can be procured to mix with other iron ores, they produce a highly beneficial effect in the running of the furnace and quality of metal turned out; though, as a rule, they will not yield forty per cent. of metal. The pig metal obtained from them is so brittle that it breaks to pieces on being dropped on hard ground. Its weakness is in part due to its containing phosphorus, arsenic, etc. When taken from swamps, the workmen often throw into the cavities loose earth, leaves, brushes, etc., which, often within eight years, leave behind them fresh deposits of ore. The most noted places of supply for bog ore in this country are: Monmouth county, New Jersey. Piscataquis county, Maine and Snowhill, on the eastern shore of Maryland. In the early part of the century much was obtained from the ponds of Plymouth county, Mass., and from Egg Harbor, New Jersey.

The Alpine Flora.—Mr. John Ball, an English botanist of much repute, has had a passion from his youth upward for the scenery and flora of lofty mountains, and has passed many a day botanizing in the Alps, the Carpathians, the Pyrenees and the ranges in Spain. A memoir just published by him points out the curious fact that a close affinity exists between the Alpine flora and those of the mountains in Northern Asia, and this notwithstanding the vast interval of space that divides them and the wide differences in their climatical conditions. In the Altai range, forming the southern boundary of Siberia, fully one-fourth of the Alpine species are present. This is the more remarkable, because in the Caucasus, which is only one-third the distance of the Altai range from the Alps, and has moreover a more favorable climate, a smaller proportion is found. Mr. Ball relates that some twenty years ago he started from the Æggisch-horn in the Alps with an ill-defined intention of reaching the uppermost end of the great glacier of Aletsch, the vastest field of snow in Europe, and of looking down on the pastures of the Wengern Alp from what is now called the Jungfrau Joch. The sun that day was hot, and the snow into which he sank at every step was soft and pasty. The great ice river is many leagues long, and has a channel two or three miles wide. Just at the point where the two great tributary streams join the main current, there was a steep slope clear of snow, and by following the track of some chamois, Mr. Ball found his way to the base of it, and made the ascent to a range of projecting rocks, which were about 10,700 feet above the sea. Along this slope, at a hight of nearly 2,000 feet above the so-called jardin, near Chamouni, he gathered over forty species of plants in flower. This incident shows how extensive is the glacial flora, and how much labor is necessary before a complete enumeration of it can be made.

Telegraphing without Wires.—Professor Loomis continues his experiments in the mountains of West Virginia to demonstrate the theory that at certain elevations there is a natural electric current, by taking advantage of which, telegraphic signals may be sent without the use of wires. It is said that he has telegraphed eleven miles by means of kites flown with copper wires. When the kites reached the same altitude, or got into the same current, communication by means of an instrument similar to that of Morse was easy, but ceased as soon as one of the kites was lowered. He has built towers on two hills about twenty miles apart, and from the tops of them has run up steel rods into the region of the electric current.—*Journal of the Telegraph.*

Eye Dyeing.—"A learned German doctor," says a Paris paper, "has discovered a means of dyeing the eyes of animals in general, and of man in particular, any color that he pleases. He is accompanied on his travels of propagation by a dog with a rose-colored eye, a cat with an orange-red eye, and a monkey with a chrome-yellow eye. But the most curious specimens of his art are a negro with one eye black and the other blue, and a negress with one eye gold-colored and the other silver-white. The doctor says the process of transformation, far from injuring the sight, strengthens and improves it."

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Oct. 15.		Week Ending Oct. 23.		Week Ending Oct. 29.		Week Ending Nov. 6.	
Alpha	16¾	15½	15¾	14½	15	13½	14½	14½
Alta	6	5	6⅝	5⅞	5⅝	6	5⅝	5⅜
Andes	1.30	1	1.15	1	1.20	1.05	1.30	1.10
Alps	....	....	....	....	....	....	....	....
Argenta	1.05	75c	1	80c	1	90c	1	90c
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	10c	....	....	....	....	....	....	....
Baltimore Con	....	....	....	....	....	....	....	....
Belcher	4.60	3.65	4	3¾	4.15	3.60	4¼	3.70
Belmont	1.10	50c	1.30	80c	1	60c	90c	75c
Best & Belcher	19¾	17½	18¾	17½	18½	17	21¾	18¾
Bullion	8⅝	7½	7¾	7	7½	5⅝	7	6⅞
Bechtel	1½	1½	1½	1½	1.45	1½	1.60	1.35
Belle Isle	4.65	4.10	4½	4½	4.90	4½	4.85	3.95
Bodie	13	12¾	13¾	12½	14½	13⅝	14	13½
Benton	3½	2¾	4.10	3.15	3.70	3½	3⅝	3.60
Bulwer	12	11½	11¾	11½	11¾	11½	11¾	11
Boyle	....	....	....	....	....	....	....	....
Black Hawk	95c	75c	80c	55c	80c	75c	75c	60c
Belvidere	85c	50c	75c	....	70c	50c	75c	65c
Booker	90c	60c	80c	65c	90c	70c	95c	70c
Caledonia	2½	2.20	2.65	2.30	2.35	2.10	2½	2½
California	6⅝	5	5¾	5¼	5⅝	5	5⅝	5¼
Challenge	2.40	2	2.20	2	3½	2	3.20	2¾
Chollar	7¾	6¾	7	6⅝	7¾	6½	8½	7½
Confidence	10½	9½	10	9	11½	9½	11¾	10½
Con Imperial	1½	1.05	1.15	1.05	1.10	1	1.10	1
Con Virginia	6⅛	5	5¾	5½	5⅝	5½	5⅞	5⅝
Crown Point	4.45	4.10	4.10	3.90	4½	3½	4.15	3.90
Con Washoe	....	....	....	....	....	....	....	....
Champion	25c	20c	25c	15c	25c	15c	20c	15c
Concordia	....	....	....	....	....	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	1.15	70c	1½	75c	85c	70c	1½	75c
Eureka Con	28	20	26¾	24	29½	24½	27	25½
Exchequer	6	5½	5⅝	5	6	4.45	5½	4.85
Endowment	55c	50c	50c	40c	....	....	50c	....
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	2.20	2	2¾	2	2½	....	2.55	2
Gila	30c	25c	30c	15c	20c	5c	85c	30c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	12½	12	11¾	....	12	11⅝	12	....
Goodshaw	35c	30c	40c	35c	50c	30c	35c	30c
Gould & Curry	12	10	10½	9¾	11½	9½	11½	10
Hale & Norcross	15¾	13½	14⅝	13½	15⅝	13	18⅝	14¾
Hillside	1.90	1½	1.90	1.85	1.60	1.65	1.70	1.45
Highbridge	....	....	....	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	15c	....	15c	....	15c	....	10c	....
Independence	1¾	1½	1.70	1½	1.65	1.10	1.35	....
Julia	4.10	3¾	3.95	3½	3.65	3.20	3¾	3.30
Justice	3½	3.10	3.20	2.85	3.05	2.20	3	2.30
Jackson	4	....	4	3½	4½	4	4	....
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	....	....	3	....
Kentuck	4.40	4	4	3.95	4	....	4½	4
Kossuth	....	....	....	....	15c	....	15c	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	90c	75c	80c	60c	75c	65c	70c	60c
Lady Wash	1.10	20c	1.20	1	1.05	95c	1.15	1.05
Leopard	55c	50c	55c	50c	50c	....	65c	45c
Leviathan	60c	55c	60c	50c	60c	50c	50c	....
Leeds	....	....	55c	50c	60c	50c	60c	50c
Lee	....	....	....	....	....	....	....	....
May Belle	....	....	25c	....	25c	....	35c	25c
Modoc	1	90c	....	....	35c	10c	....	....
Manhattan	2¾	....	2¾	....	2¾	2½	2½	....
Martin White	1¾	1⅝	1¾	1½	1.80	1½	1.65	1½
McClinton	65c	30c	35c	....	50c	40c	40c	....
Meadow Valley	5c	....	....	....	....	....	....	....
Mexican	43¾	32½	36½	34	38	33	37¾	33½
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	....	....
North Con Virginia	9½	....	....	....	....	....	....	....
New York	60c	40c	60c	35c	40c	30c	40c	35c
Northern Belle	4	3.60	5¾	4¾	5¾	5	5½	5½
New Coso	....	....	....	....	....	....	....	....
Navajo	65c	40c	50c	35c	50c	45c	60c	50c
Occidental	2½	2½	2½	2½	2.40	2	2.45	2½
Ophir	38½	34½	36	32	34½	30	33¾	31½
Oriental	40c	10c	40c	35c	50c	30c	40c	25c
Overman	9⅞	9	9⅝	9	9½	8½	9½	9
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	....	....	....	....
Phil Sheridan	60c	20c	60c	35c	50c	35c	50c	35c
Potosi	6½	5⅝	5⅞	5½	6	5	6½	5½
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	1½	1.15	1½	1.20	1½	1.20	1½	1.40
Richer	25c	....	25c	....	25c	....	....	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	14¾	12½	13	11½	15½	12½	17	14⅞
Seg Belcher	....	....	....	....	20c	....	20	....
Sierra Nevada	66½	50	64½	56	61½	56	59	50½
Silver Hill	2	1.30	1.40	1.20	1½	1.15	1.30	1.20
Silver King	8	....	6⅞	6	6⅞	6½	7	6¾
Silver Prize	....	....	....	....	....	....	....	....
Succor	....	....	25c	20c	30c	25c	35c	15c
Summit	1.60	1½	1.55	1.40	1.85	1½	1.85	1½
Scorpion	6⅞	3.40	5½	4¾	5½	4½	5	3.90
Solid Silver	30c	15c	25c	20c	5c	....	50c	5c
South Bodie	20c	....	15c	....	25c	15c	15c	....
South Standard	20c	....	10c	....	....	....	....	....
Star	65c	50c	60c	55c	55c	50c	40c	....
St. Louis	....	....	....	....	....	....	....	....
Syndicate	6½	4.90	7	5⅞	6⅞	6	6½	6
Tioga Con	3¼	2.60	3.60	3½	3¾	3.40	3½	3¼
Tiptop	1½	1.10	1.30	1.20	1.40	1.30	1.40	1.30
Trojan	20c	15c	20c	15c	15c	10c	15c	....
Union Con	94	70	76	69	90½	73	91½	81½
Utah	27½	20½	25	21½	22½	20	22	20
Vermont Con	....	....	....	....	....	....	....	....
Ward	2.85	2.65	2¾	2½	2½	2.15	2½	2⅝
Wells-Fargo	20c	10c	20c	10c	15c	10c	10c	....
Woodville	40c	30c	30c	....	35c	25c	35c	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	17	15½	15½	14½	17½	14	17	15⅞

Sales at S. F. Stock Exchange.

Friday A. M., Oct. 31.

120 Alpha 14½@14¾
20 Alta 5⅝
315 Andes 1¼@1.20
130 Benton 3¾
10 Best & Belcher 18¾
245 Bullion 7@6⅞
100 Belcher 3⅞@3.95
35 Confidence 10½
385 California 5⅝
280 Con Virginia 5½@5⅝
425 Chollar 7½
450 C Dorado 3
320 Challenge 2.90@2¾
250 Crown Point 3.90
380 Con Imperial 1.10@1.05
80 Caledonia 2.30@2.35
230 Exchequer 5⅜@5½
260 Flowery 45c
2125 Golden Gate 2½@2¼
115 Gould & Curry 10½@10⅝
235 Hale & Nor 15@14¾
105 Justice 2.80@2.85
160 Julia 3.30@3.45
40 Kentuck 4@4.10
175 Lady Bryan 65@70c
150 Leviathan 50c
150 Lady Wash 1.05
820 Mexican 37¼@37¾
1940 Mackey 25c
1000 Mt View 2.60@2¾
200 New York 35c
480 N Bonanza 1.10@1
140 Ophir 33½@33¾
80 Phil Sheridan 40c
300 Potosi 5⅝@5¾
50 Senator 25c
70 Silver Hill 1.20
400 Scorpion 5
50 Solid Silver 5c
1250 Succor 25@35c
950 Savage 14⅞
370 Sierra Nevada 59@58
1100 Trojan 15c
1120 Union Con 91½@87½
50 Utah 22@21½
1150 Wells Fargo 10c
310 Ward 2½@2.40
150 Yellow Jacket 16½@16⅝

AFTERNOON SESSION.

950 Argenta 90@95c
150 Adenda 45@50c
150 Belmont 90c
75 Boston 1.45@1½
100 Belvidere 65c
335 Booker 75@80c
70 Bulwer 11@11½
30 Bodie 14
345 Bechtel 1.35
980 Belle Isle 4.85@4¾
2025 Champion 20@15c
50 C Pacific 7½
375 Dudley 1.30@1¼
900 Day 85@80c
1100 Endowment 50c
115 Eureka Con 27@26½
120 Grand Prize 2.55@2½
100 Gila 35c
70 Goodshaw 30c
125 Hillside 1.70@1.65
430 Jupiter 2.10
250 Leopard 50@45c
50 Leeds 50c
185 Mammoth 7½
650 Metallic 75c
10 Mono 7
50 McClinton 40c
375 Mt Diablo 10@9½
20 Manhattan 2½
250 May Belle 25c
100 Noonday 4¾@4.80
500 Navajo 50c
800 N Noonday 4@4.05
650 Orient 30c
50 Oriental 30c
810 Paradise 95c
50 Queen Bee 35c
1380 Ray'd & Ely 1½
100 Real del Monte 6¼
60 S Bodie 15c
25 Silver King 6¾@6½
300 Star 40c
145 S Bulwer 30c
100 Syndicate 6½
50 Summit 1½
350 Tioga Con 3.40
675 Tiptop 1.30@1.35
25 University 25c
150 Vortex 40@45c
60 Wales 6½

Saturday A. M., Nov. 1.

900 Argenta 95c
20 Alpha 14½
35 Alta 5⅝@5¾
1025 Andes 1¼@1.30
1000 Altas 25c
110 Best & Belcher 18½@18⅝
50 Belcher 3⅞
440 Bullion 6⅞@7
290 Benton 3.70@3.60
260 Belmont 80c
955 Belle Isle 4.80@4⅞
90 Bodie 13½
195 Bechtel 1½
200 Belvidere 65c
375 Booker 85@95c
50 Bulwer 11
135 California 5½@5⅝
10 Crown Point 3.90
83 Con Virginia 5⅝@5½
1110 Chollar 8@8⅜
200 Con Imperial 1.10
45 Caledonia 2.30
150 Challenge 2¾@3
400 Con Dorado 2.90@3
50 C Pacific 7⅞
125 Caledonia (B H) 1⅞
570 Day 80@75c
350 Dudley 1½
115 Exchequer 5⅛
425 Eureka Con 25½@26⅛
200 Flowery 50c
1630 Gould & Curry 11@11½
775 Golden Gate 2
175 Grand Prize 2½
300 Gila 30c
200 Goodshaw 35c
1265 H & Norcross 17⅝@18
660 Hillside 1.65
50 Independence 1.35
100 Justice 3
400 Julia 3½@3.60
100 Jupiter 2.05
175 Lady Bryan 65@70c
575 Lady Wash 1.10
100 Leeds 60c
500 Mexican 35¾@36
160 Mackey 25c
700 Metallic 75@80c
225 Mt Diablo 9@9½
80 Mount View 2.60
20 Mono 6⅞
275 May Belle 25c
170 Mammoth 7@7½
100 M White 1.65
100 New York 40c
600 N Bonanza 1.05@1.15
100 Northern Belle 5½
8400 N Belle Is 25@30c
370 Noonday 4.90
650 N Noonday 4
700 Navajo 50c
40 Ophir 32
55 Overman 9½
200 Occidental 2.45@2.40
200 Orient 30c
1190 Potosi 6¼@5⅞
100 Plutus 2.40
250 Paradise 90c
50 Phil Sheridan 50c
750 Raymond & Ely 1½@1.40
210 Real Del Monte 7@6¾
300 Queen Bee 45c
780 Savage 16¼@17
400 Succor 25@30c
20 Seg Belcher 20
700 Sierra Nevada 56½@55¼
790 Silver Hill 1¼@1.20
325 Scorpion 5@4.90
450 Solid Silver 5@10c
200 Star 40c
100 Syndicate 6¼
100 Summit 1.85
1440 S Bulwer 35@40c
50 Silver King 7
2100 Trojan 15c
4600 Tuscarora 85c@1
220 Tioga 3½@3.40
400 Tiptop 1.35
515 Union Con 87½@88½
225 Utah 21½@20½
200 University 25c
2320 Wells-Fargo 10c
450 Ward 2.40@2½
100 Woodville 35c
20 Wales 6½
230 Yellow Jacket 16@16½

Monday A. M., Nov. 3.

30 Alpha 14½
100 Andes 1.20
80 Alta 5½
470 Belcher 3.80@3.70
475 Best & Belcher 19@18½
500 Bullion 6⅞
650 Benton 3.60@3.65
60 Confidence 11
360 California 5⅝@5½
150 Con Imperial 1.10
165 Crown Point 3.95@4
350 Con Virginia 5⅝@5¾
740 Challenge 3.10@3.20
90 Caledonia 2¼@2.30
810 Chollar 8⅜@8½
250 C Dorado 3@2.90
255 Exchequer 5¼@5½
100 Fairfax 80c
390 Gould & Curry 11@10⅞
830 Golden Gate 2
1390 Hale & Nor 18@18⅝
170 Justice 2.90@2.80
540 Julia 3⅞@3.60
20 Kentuck 4½
200 Lady Wash 1.10@1.15
270 Lady Bryan 65c
200 Leviathan 50c
440 Mexican 34½@34¼
600 Mackey 15c
380 Mt View 2.60@2⅝
275 New York 35c
125 N Bonanza 1.15@1⅛
260 Ophir 31½@31¾
150 Overman 9¼@9½
100 Occidental 2¼
1250 Potosi 5¾@6¼
1105 Savage 16½@16⅝
270 Silver Hill 1.20@1¼
530 Scorpion 4¼@3.90
1000 Succor 30c
1885 Sierra Nevada 52½@50½
1000 Trojan 15c
745 Union Con 82@81½
315 Utah 20
170 Ward 2.45
2100 Wells-Fargo 10c
335 Yellow Jacket 16½@15⅞

AFTERNOON SESSION.

1435 Argenta 90c@1
250 Albion 15c
700 Adenda 45@50c
50 Boston 1.45
100 Black Hawk 70c
100 Belvidere 75@70c
450 Booker 75@70c
730 Belle Isle 4¾@4.60
300 Belmont 90c
300 Bodie 13½@13⅝
670 Bechtel 1¼@1½
220 C Pacific 7½
700 Champion 20@15c
1075 Dudley 1.20@1½
1410 Day 1
100 Endowment 50c
15 Eureka Con 26
500 Glynn Dale 25c
250 Goodshaw 30@35c
395 Grand Prize 2¼@2½
150 Gila 30c
150 Hillside 1½
10 Jackson 4
670 Jupiter 2@1.90
350 Leopard 50@45c
120 M White 1½
155 Mammoth 7@7½
390 May Belle 30c
25 Mono 6¾@7
100 McClinton 40c
450 Mt Diablo 10@9½
25 Manhattan 2½
200 Metallic 75c
25 Northern Belle 5½
600 N Belle Is 30c
1050 Noonday 4.95@5
300 N Noonday 4@3.90
400 Navajo 50c
400 Oriental 40c
100 Orient 30@35c
205 Paradise 85c@1
650 Queen Bee 55@50c
400 Raymond & E 1½
280 Real del Monte 6@6⅛
400 S Bulwer 30@35c
430 Syndicate 6¼@6
250 Star 40c
200 Tuscarora 1@1½
330 Tioga Con 3¾
100 Tiptop 1.35
900 University 30@20c
150 Vortex 50@45c

Tuesday A. M., Nov. 4.

125 Alta 5½@5⅝
570 Andes 1.10@1.15
240 Bullion 6¾@6⅞
285 Belcher 3.80@3¾
135 Best & Belcher 19@18¾
295 Benton 3.70
450 California 5⅝
150 Con Virginia 6⅛
510 Chollar 8½@8
60 Confidence 10½
1110 Con Imperial 1.05@1
310 Crown Point 3.90@4
525 Con Dorado 3@2.85
420 Challenge 3.05@3
710 Caledonia 2¼@2½
450 Exchequer 5
50 Fairfax 70c
100 Flowery 45c
1190 Golden Gate 2
360 Gould & Curry 10@10⅛
655 H & Norcross 17@17¼
180 Justice 2.90@3
440 Julia 3.55@3.60
25 Kentuck 4¼
100 Kossuth 15c
1020 Lady Wash 1.10@1.05
100 L Bryan 65c
630 Mexican 33½@33¼
2770 Mackey 15@20c
150 Mt View 2.40@2¼
420 N Bonanza 1.10
300 New York 35@40c
150 Overman 9¼@9
215 Occidental 2.40@2¼
180 Ophir 31¾@31½
100 Phil Sheridan 40c
505 Potosi 5⅝@5½
100 Solid Silver 5c
590 Savage 15⅝@15½
110 Silver Hill 1.20@1¼
1120 Sierra Nevada 54@51
2000 Succor 15c
260 Scorpion 4.40@4.35
1000 Trojan 15c
545 Union Con 85½@86½
180 Utah 20¼@20½
1100 Wells-Fargo 10c
555 Yellow Jacket 15⅞@16

AFTERNOON SESSION.

1700 Argenta 95c@1
200 Albion 15c
135 Addenda 45@40c
400 Atlas 20c
1420 Belle Isle 4¾@4.70
960 Belmont 65@60c
20 Bodie 13½
1200 Bechtel 1½@1.60
175 Belvidere 70c
150 Black Hawk 70@75c
700 Booker 75@85c
150 Boston 1.40
1110 Champion 20c
250 C Pacific 7@7½
2490 Day 1½@1.10
50 D Standard 50c
10 Eureka Con 25½
850 Gila 30@35c
205 Grand Prize 2.10@2
1000 Goodshaw 35c
120 Hillside 1.60@1.65
30 Jackson 4
450 Jupiter 2@1.90
90 Leopard 65c
180 Leeds 50c
100 Metallic 60c
110 Mt Diablo 10@10½
450 McClinton 40c
475 Mono 7¼@7½
1160 Martin White 1½
30 Mammoth 7
980 Navajo 50c
80 Northern Belle 5¼
2700 N Belle Is 30c
2045 Noonday 4@4.10
1600 N Noonday 5@4.95
200 Oriental 30@25c
100 Orient 30c
430 Paradise 90c@1
650 Queen Bee 55@60c
420 Raymond & Ely 1.45@1½
60 Syndicate 6¼
780 S Bulwer 40c
590 Tuscarora 1¼@1½
440 Tioga 3½@3.35
1275 Tiptop 1.40@1.35
320 University 25c
650 Vortex 45c
30 Wales 6½

Wed'sday A. M., Nov. 5.

80 Alpha 14½@14¼
150 Andes 1.10
90 Alta 5⅜
85 Bullion 6¾@6⅞
185 Benton 3.70@3.60
225 Belcher 3.95@4⅛
80 Best & Belcher 19½@19¼
520 California 5¼@5⅜
65 Confidence 11@11¼
300 Con Imperial 1.05
410 Crown Point 4.15@4
595 Con Virginia 5⅝@5¾
645 Chollar 6¼@8⅛
120 Challenge 3
300 Con Dorado 2.80
70 Caledonia 2.30
140 Exchequer 4.90@5
175 Flowery 45c
960 Golden Gate 2
75 Gould & Curry 10⅞
315 Hale & Nor 18¾@18½
250 Julia 3⅞
100 Justice 2.90@2.85
30 Kentuck 4.15@4½
140 Lady Wash 1.10
230 Lady Bryan 65@60c
1270 Mackey 15@20c
350 Mt View 2.60@2½
280 Mexican 34½@34¾
295 New York 35@40c
150 N Bonanza 1.10@1.15
110 Ophir 32¼@32½
110 Overman 9¾
300 Occidental 2.30@2¼
300 Potosi 5⅝
300 Phil Sheridan 40c
300 Plutus 3½
305 Sierra Nevada 57@56
295 Savage 15¾@16
150 Solid Silver 50c
195 Scorpion 4.65@4¾
1600 Succor 20@25c
250 Silver Hill 1.30@1¼
590 Trojan 15c
55 Utah 20¾@20½
215 Union Con 85½@65½
500 Wells-Fargo 10c
120 Ward 2.40@2⅜
650 Yellow Jacket 17

AFTERNOON SESSION.

450 Argenta 95c
500 Albion 15@20c
40 Atlas 25c
350 Addenda 45c
125 Boston 1.40@1.35
200 Black Hawk 60c
300 Booker 65c
100 Belvidere 70c
270 Bulwer 11½
140 Bodie 13¾@13⅝
790 Bechtel 1.60@1½
675 Belmont 75c
855 Belle Isle 4@3.95
900 Champion 20@15c
100 C Pacific 7⅞@7½
1285 Day 1.15@1¼
530 Dudley 1¼@1.30
50 Defiance 50c
1500 Endowment 50c
210 Golden Terra 12
150 Goodshaw 35c
120 Grand Prize 2.10
500 Gila 30c
100 Hussey 10c
175 Hillside 1½@1.45
310 Independence 1¾@1.40
20 Jackson 4
240 Jupiter 1.90
40 K K Con 3
520 Leopard 45@50c
10 Mammoth 7
1960 Martin White 1½@1.60
600 May Belle 35c
110 Mono 7½
100 McClinton 40c
10 Manhattan 2½
70 Metallic 80c
355 Mt Diablo 12½
150 Navajo 55@60c
330 Northern Belle 5¼
3545 N Belle Is 30c
370 Noonday 5
225 N Noonday 4@4.05
1000 Oro 15c
250 Orient 30c
350 Oriental 25c
200 Paradise 1
1100 Queen Bee 60c
345 Real del Monte 5@5⅜
100 Raymond & E 1.40
75 Star 40c
370 Syndicate 6½@5¼
305 S Bulwer 40c
200 Summit 1⅞
1845 Tuscarora 1
10 Tioga Con 3.35
50 Tiptop 1.30
325 University 25@20c
150 Vortex 50@45c

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Argonaut M & M Co	California	2	10	Oct 7	Nov 15	Dec 8	J L Fields	240 Montgomery st
Bechtel Con M Co	California	3	15	Oct 1	Nov 5	Nov 25	W H Lent	309 Montgomery st
Benton Con M Co	Nevada	2	50	Sept 17	Oct 22	Nov 10	W H Watson	302 Montgomery st
Champion M Co	California	4	20	Oct 15	Nov 20	Dec 9	Jno Crockett	203 Bush st
Gen'l Thomas M & M Co	Nevada	5	25	Nov 3	Dec 8	Dec 29	Wm Willis	309 Montgomery st
Gila S M Co	Nevada	5	25	Sept 30	Nov 3	Nov 24	W W Parrish	328 Montgomery st
Grand Prize M Co	Nevada	2	50	Sept 17	Oct 21	Nov 11	J E Dixon	20 S F Stock Ex
Jupiter M Co	California	5	30	Sept 18	Oct 21	Nov 10	E O Masten	22 Nevada Block
K K Con M Co	Nevada	9	2 00	Oct 3	Nov 5	Dec 3	B B Minor	309 Montgomery st
Murchie G & S M Co	California	2	25	Oct 9	Nov 8	Dec 8	S D Rogers	328 Montgomery st
New York M Co	Nevada	20	30	Oct 22	Nov 24	Dec 16	D L Thomas	203 Bush st
Potosi M Co	Nevada	2	50	Nov 4	Dec 9	Dec 30	W E Dean	203 Bush st
Real Del Monte M Co	Nevada	8	1 00	Sept 18	Oct 20	Nov 29	C V Hubbard	203 Bush st
Rough & Ready Con G M Co	California	1	05	Oct 15	Nov 19	Dec 9	W H Lent	309 Montgomery st
Savage M Co	Nevada	39	1 00	Sept 22	Oct 31	Nov 20	E B Holmes	309 Montgomery st
Seg Belcher M Co	Nevada	16	3 00	Oct 31	Dec 5	Dec 26	Geo D Edwards	414 California st
Sierra Nevada S M Co	Nevada	60	2 00	Oct 31	Dec 4	Dec 24	W W Stetson	309 Montgomery st
Silver Hill M Co	Nevada	8	50	Oct 16	Nov 19	Dec 11	W E Dean	203 Bush st
Solid Silver G & S M Co	Nevada	2	25	Oct 6	Nov 10	Dec 8	J J Applegate	320 Sansome st
Utah S M Co	Nevada	27	2 00	Oct 22	Nov 25	Dec 13	G C Pratt	309 Montgomery st
Yellow Jacket S M Co	Nevada	24	1 00	Oct 13	Nov 18	Dec 18	Mercer Otey	Gold Hill, Nevada

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Hydraulic Grav M Co	California	1	20	Oct 2	Nov 10	Dec 13	James Ireland	216 Sansome st
Butte Hydraulic M Co	California	—	10 00	Oct 31	Dec 2	Dec 22	L L Dennery	220 Sansome st
Chollar M Co	Nevada	—	50	Nov 4	Dec 9	Dec 29	W E Dean	203 Bush st
De Haro M Co	Nevada	2	10	Sept 24	Oct 27	Nov 12	W W Bausman	409 California st
Double Standard G M Co	California	1	10	Sept 13	Oct 21	Nov 11	W H Lent	309 Montgomery st
Diana G & S M Co	Nevada	4	10	Sept 24	Nov 17	Dec 5	J T McGeoghan	318 Pine st
Equitable Tunnel & M Co	Utah	21	10	Sept 16	Oct 21	Nov 14	C J Collins	227 Montgomery st
Florida Hill M Co	Idaho	1	10	Oct 31	Dec 5	Dec 30	R Wegener	414 California st
Geo Douglas M Co	Nevada	3	10	Sept 24	Oct 27	Nov 13	W W Bausman	409 California st
Hamburg M Co	Nevada	1	1 00	Sept 19	Oct 21	Nov 10	D A Jenning	401 California st
Joe Scates Con S M Co	Nevada	4	10	Sept 24	Oct 27	Nov 13	W W Bausman	409 California st
J & K G M Co	California	1	15	Sept 29	Nov 3	Nov 24	W H Lent	309 Montgomery st
Mammoth Grove M Co	California	1	02	Oct 9	Nov 13	Nov 29	A B Paul	328 Montgomery st
Mayhelle Con M Co	California	3	10	Sept 8	Oct 15	Nov 10	A W Fox	310 Pine st
Mayflower G M Co	California	6	10	Oct 9	Nov 12	Dec 9	J Morlzio	328 Montgomery st
McClinton M Co	California	4	25	Oct 10	Nov 14	Dec 4	W H Lent	309 Montgomery st
Meadow Valley M Co	Nevada	15	25	Sept 12	Nov 12	Dec 8	T W Colburn	414 California st
Mono and Cross Con M Co	California	1	10	Oct 8	Nov 12	Nov 29	J M Buffington	309 California st
Monte Cristo Con M Co	California	1	10	Oct 3	Nov 17	Dec 15	Butler Burris	309 Montgomery st
Mt Hood M Co	Nevada	3	10	Sept 24	Oct 27	Nov 13	W W Bausman	409 California st
Nob Hill G & S M Co	California	1	15	Oct 6	Nov 10	Nov 28	J H Sayre	330 Pine st
North Scorpion M Co	Nevada	1	10	Aug 11	Nov 3	Nov 20	T B Ludlum	211 Sansome st
Numa M Co	Nevada	2	02	Oct 23	Nov 24	Dec 15	D Wilder	328 Montgomery st
Orion M Co	California	5	30	Oct 9	Nov 10	Nov 25	P Conklin	28 Sansome st
Quartz Mountain G M Co	California	7	50	Sept 20	Oct 27	Nov 17	E Hestrea	729 Montgomery st
Rustler G M Co	California	2	10	Oct 21	Nov 24	Dec 12	A F Main	309 California st
Sabine M Co	Nevada	2	10	Sept 24	Oct 27	Nov 12	W W Bausman	409 California st
San Xavior M & S Co	Arizona	1	25	Oct 14	Nov 17	Dec 8	F A McGee	32 Merchants' Ex
South Comstock G & S M Co	Nevada	6	25	Sept 9	Oct 13	Nov 3	J M Buffington	309 California st
South Bulwer G M Co	California	5	25	Oct 27	Nov 29	Dec 20	W Stuart	320 Sansome st
Slate Creek G M Co	California	2	10	Sept 15	Oct 20	Nov 10	J L Fields	240 Montgomery st
Tolo M Co	Nevada	2	10	Sept 24	Oct 27	Nov 12	W W Bausman	409 California st
Vancouver M Co	Nevada	3	10	Sept 24	Oct 27	Nov 13	W W Bausman	409 California st
Wide Awake P & M Co	Arizona	8	03	Oct 11	Nov 11	Dec 11	O Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
America M Co	California	J E Mason	306 Pine st	Annual	Nov 11
Bodie Tunnel & M Co	California	A F Main	309 California st	Annual	Nov 10
Challenge Con M Co	California	W E Dean	203 Bush st	Annual	Nov 20
Curtis Con M Co	California	H L Stone	419 Pine st	Stockholders	Nov 20
Harrington M Co	California	O C Miller	426 California st	Annual	Nov 18
Maryland Con G & S M Co	California	E P Farnsworth	202 Sansome st	Annual	Nov 14
Napa Con Q M Co	California	W W Parrish	328 Montgomery st	Annual	Nov 12
Summit G M Co	California	W H Lent	309 Montgomery st	Annual	Nov 17

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Belle Isle M Co	Nevada	R H Brown	S F Stock Ex	75	Nov 5
Bodie Con M Co	California	W H Lent	Nevada Block	50	Nov 1
California M Co	Nevada	C P Gordon	23 Nevada Block	50	Aug 17
Con Virginia M Co	Nevada	A W Haven	309 Montgomery st	50	Aug 16
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	2 00	Oct 20
Independence M Co	Nevada	John E Dixon	Stock Exchange	25	Aug 21
Indian Queen M & M Co	———	A K Durbrow	69 Nevada Block	20	Aug 21
Napa Con Q M Co	California	Wm W Parrish	328 Montgomery st	10	July 26
Martin White M Co	Nevada	J J Scoville	309 Montgomery st	30	July 28
Montezuma M & M Co	———	J T McGeoghegan	318 Pine st	25	Aug 12
Pioneer M Co	California	J W Pew	310 Pine st	08	October 6
Standard Con M Co	California	Wm Willis	309 Montgomery st	50	Oct 13

SALES OF LAST WEEK AND THIS COMPARED

Thursday A.M., Oct. 30.

220 Alta 5⅝@5¾
480 Alpha 15
300 Andes 1.15@1.20
165 Best & Belcher 18½@18¾
255 Belcher 4.15
475 Bullion 7¼@7½
245 Benton 3.65
400 Con Virginia 5½
202 California 5@5¼
450 Chollar 7¾@7⅝
965 Con Imperial 1.10
120 Confidence 11¾@11½
100 Crown Point 4½
65 Caledonia 2.30@2.35
470 Challenge 3¼@3.20
500 C Dorado 2¾
820 Exchequer 5½@6
100 Flowery 45c
440 Gould & Curry 11@11½
1000 Golden Gate 2@2½
295 Hale & Nor 15½@15¾
325 Justice 3.05@3
100 Julia 3.65@3.60
35 Kentuck 4
450 L Bryan 65c
820 Lady Wash 1@1.05
350 Leviathan 55@50c
575 Mexican 37@38
660 Mackey 30@25c
840 N Bonanza 1.20@1.15
100 New York 40@35c
30 Occidental 2½@2.40
255 Ophir 34½@33¾
200 Overman 9¼@9½
720 Potosi 5⅝@6
190 Phil Sheridan 40@50c
665 Savage 15½@15¼
705 Sierra Nevada 60½@60
295 Silver Hill 1¼@1.20
1300 Succor 40@30c
100 Senator 25c
650 Scorpion 5½@5¾
210 Utah 22@21½
465 Union-Con 90½@89½
100 Woodville 35c
2740 Wells-Fargo 10@15c
890 Ward 2½
575 Yellow Jacket 17½@17¼

AFTERNOON SESSION.

300 Adenda 45c
1365 Argenta 95c@1
1430 Belmont 90c@1
450 Booker 75@80c
100 Belvidere 60c
1120 Belle Isle 4.85@4.95
295 Bechtel 1.35
600 Bodie 14¾@14¾
520 Boston 1½@1.45
1100 Champion 20c
150 Con Pacific 7¾
500 Caledonia (B H) 1¾
1000 Day 75@85c
50 D Standard 50c
50 Defiance 50c
850 Dudley 1¼@1.30
200 Endowment 50c
210 Eureka Con 26@26½
75 Goodshaw 30c
370 Grand Prize 2.55@2.65
600 Hillside 1.70@1.65
310 Jupiter 2.30@2.40
200 Leeds 50c
230 M White 1¾
200 Mammoth 7
625 Metallic 60@75c
1050 May Belle 25c
250 Mono 6½
550 Noonday 4¼@4.40
1250 Navajo 50c
1250 N Noonday 3.90@3.95
90 Northern Belle 5⅝
500 N Belle Is 30c
450 Orient 35c
450 Paradise 1
450 Queen Bee 30@35c
110 Real del Monte 5@5½
347 Raymond & E 1.20@1¼
235 Silver King 6⅝@6⅞
200 Syndicate 6½
480 S Bulwer 30@35c
100 Star 45c
100 Tuscarora 80@95c
140 Tiptop 1.30
930 Tioga Con 3.40@3½
150 Vortex 40@45c
50 Wales 7

Thursd'y A. M., Nov. 6.

20 Alpha 14½
90 Alta 5⅜@5¼
330 Andes 1.20@1.15
330 Belcher 3.85@3.90
690 B & Belcher 21@21¾
235 Benton 3.65@3.70
530 Chollar 8½@8¾
180 Con Imperial 1.05@1.10
130 Crown Point 4@3.95
225 California 5¼
310 Con Virginia 5⅞@5⅞
165 Confidence 11@11½
80 Caledonia 2¼
100 Challenge 3
1650 C Dorado 3@3¼
180 Exchequer 4.90@4.65
325 Flowery 45c
550 Fairfax 60c
290 Gould & Curry 11½@11¾
960 Golden Gate 2
205 Hale & Nor 17¾
20 Justice 2.90@2.95
435 Julia 3½@3.55
80 Kentuck 4.20
200 Kossuth 15c
100 Lady Bryan 60c
575 Lady Wash 1.05@1.10
140 Mexican 33½@33¾
300 Mt View 3@3.30
520 Mackey 20c
375 New York 35c
200 North Carson 10c
195 N Bonanza 1.15@1.10
60 Ophir 32¼
100 Overman 9½
150 Occidental 2.30@2.40
290 Potosi 5½@5⅝
470 Phil Sheridan 35@40c
30 Plutus 2½
180 Savage 15⅞@15⅜
85 Sierra Nevada 57@57½
300 Silver Hill 1½@1.20
295 Scorpion 4.90@4¾
600 Trojan 15c
60 Utah 20¾@20½
655 Union 83½@82
600 Wells-Fargo 10c
530 Ward 2½@2.40
300 Yellow Jacket 16⅞@16½

AFTERNOON SESSION.

200 Addenda 50c
1130 Argenta 95c
150 Booker 90c
25 Belvidere 70c
50 Bulwer 11½
10 Bodie 13¾
1110 Belle Isle 4.15@4
550 Bechtel 1¼@1.65
150 Belmont 80@75c
850 Champion 20@15c
275 Caledonia (B H) 1½@2
75 C Pacific 7⅜@7½
235 Day 1.15@1.20
50 D Standard 25c
200 Dudley 1.30
1600 Endowment 55c
105 Eureka Con 25½
210 Golden Terra 12@12½
100 Giant & O A 5
50 Grand Prize 2.20
240 Gila 40@50c
540 Goodshaw 35@40c
400 Hillside 1.30
250 Jupiter 1.90
60 K K Con 3⅜
550 Leopard 50c
375 Martin White 1.65@1.60
350 May Belle 30c
450 McClinton 40c
550 Mt Diablo 13@14
2060 Metallic 90c@1
120 Mono 7¼@7
605 Noonday 5
870 Navajo 60@70c
575 N Noonday 4
2300 N Belle Is 35c
300 Orient 35c
1000 Oro 15c
100 Oriental 20c
750 Paradise 1
1000 Queen Bee 60c
690 Raymond & Ely 1.45
160 Real del Monte 4½
70 Syndicate 6⅞
600 S Bodie 20c
650 S Bulwer 40c
325 Summit 1.70@1.60
100 Star 35c
800 Tuscarora 1@1.10
200 Tioga Con 3.30
400 Tiptop 1.40
100 University 25c
35 Wales 6

Pacific Board—Latest Sales.

Wed'sday A. M., Nov. 5.

50 Alpha 14½
50 Andes 1.10
50 Alta 5½
20 Benton 3⅜
160 Best & Belcher 19½@18¾
120 Bullion 6⅞@6½
100 Belcher 3.85
110 California 5.40@5⅜
330 Crown Point 4.20@4
200 Con Virginia 5⅞
20 Chollar 8
65 Con Imperial 1.05
795 Colorado 4.05@4
120 Exchequer 5@4.90
240 Gould & Curry 10⅞@10⅝
250 Hale & Nor 18½@18
200 Julia 3.55
150 Justice 2.90
140 Mexican 34½@33¾
125 Ophir 31½@32¼
20 Potosi 5⅝
100 Richer 25c
300 Savage 15⅞@15⅝
50 Scorpion 4½
140 S Nevada 56½@54½
15 Silver Hill 1.20
400 Trojan 15c
40 Union 66@85¾
600 Wells-Fargo 10c
15 Yellow Jacket 17¼@17¾

AFTERNOON SESSION.

5 Andes 1
50 Belcher 3.95
50 Best & Belcher 19¾
300 C P Ravine 25c
100 Con Imperial 1.05
70 Con Virginia 5⅞@5.80
40 Crown Point 4
5 Exchequer 5
310 Gould & Curry 10⅞@11
100 N Noonday 4
100 New York 37c
10 North Con Vir 10½
50 Ophir 32¼
200 Oro 1.35
5 Potosi 5⅝
60 Silver Hill 1¼
80 Savage 15⅞@16
50 Scorpion 4.80
10 Sierra Nevada 56½
100 Trojan 15c
100 Ward 2.40
30 Yellow Jacket 16⅞

California Board—Latest Sales.

Wed'sday A. M., Nov. 5.		AFTERNOON SESSION.	
20 Alpha	14¾	20 Alpha	14¾
30 Alta	5¾	30 Alta	5¾
100 Argenta	1	100 Argenta	1
100 Alina	3c	100 Alina	3c
100 Atlas	25c	100 Atlas	25c
100 Atlanta	10c	100 Atlanta	10c
40 Belcher	4.10	40 Belcher	4.10
50 Best & Belcher	19¾	50 Best & Belcher	19¾
80 Bullion	6¼@6¾	90 Bullion	6¼@6¾
45 California	5⅝	45 California	5⅝
75 Coo Virginia	5¾	75 Coo Virginia	5¾
200 Coo Imperial	1.05	200 Coo Imperial	1.05
60 Crown Point	4.15	60 Crown Point	4.15
55 Chollar	8¼@8½	55 Chollar	8¼@8½
25 Caledonia	2.30	25 Caledonia	2.30
115 Exchequer	5@1.05	45 Challenge	31
40 Gould & Curry	10¼	115 Exchequer	4.95@5
400 Globe	40c	40 Gould & Curry	10¼
30 Hale & Nor	18¼	30 Hale & Nor	18¼
40 Julia	3.60@3.65	40 Julia	3.60@3.65
50 Justice	2.90@2.95	50 Justice	2.90@2.95
30 Mexican	34¼@34½	30 Mexican	34¼@34½
100 Mint	12c	100 Mint	12c
1000 North Carson	1c	1000 North Carson	1c
30 Ophir	32¼@32½	30 Ophir	32¼@32½
40 Potosi	5¼@5½	40 Potosi	5¼@5½
20 Savage	10	20 Savage	10
40 Sierra Nevada	56¼	40 Sierra Nevada	56¼
100 Senator	25c	100 Senator	25c
150 Trojan	15c	150 Trojan	15c
20 Union Con	86¼@86½	20 Union Con	86¼@86½
100 Wells-Fargo	10c	100 Wells-Fargo	10c
50 Yellow Jacket	17¼@17½	50 Yellow Jacket	17¼@17½

Mining Share Market.

The market began the week with some symptoms of strength, but as one of our exchanges remarks, it was not "boisterous," though firm and steady. Prices continued good during the week, and Bodies were quite well sustained. The demand for Comstocks extended all along the line. Bodies have been heavily purchased by insiders, however. The fluctuations were slight in every direction. The water stocks created some little excitement on Monday morning, while a few others gained strength through sympathy. The transactions were slight, however, and speedily lost tone under a small offering of stocks. The outlook on Tuesday was rather gloomy. There were no large offerings and no rush of buyers. There has been, indeed, nothing of sufficient interest in the market to call for much writing. The slight tone periodically existing is as periodically destroyed by a slight fall in prices. So if the market should indicate a gaining strength on one day, the next day is sure to show weakness and apathy, and so on. The market on Thursday displayed a little life, gathering some strength, and, up to the time of writing, a special demand exists for Best & Belcher and Sierra Nevada: the former being the favorite, although the latter was the only stock that held up in price, which is singular for the reason that assessment No. 60 for $2 has been levied.

The National Iron Works.

The first melt was made in the foundry of these new works on Tuesday evening last, so that they are now fairly under way and ready for work of every description. The proprietors are Messrs. Marshutz & Cantrell. Mr. L. C. Marshutz was a partner with Hinckley & Co., of the Fulton, for many years. Mr. T. G. Cantrell was formerly of the firm of Hawkins & Cantrell. Both gentlemen have had some 25 years' experience in the iron business in this city.

They have leased the 50-vara lot and premises formerly occupied by the old San Francisco planing mills, on the northwest corner of Main and Howard streets. The building is a very large one, being three stories high and covering an area of 91x137 feet. The lower corner room is the machine shop, having doors opening on both streets, which facilitates the handling of large pieces of work. At one corner are the offices, which are neatly fitted up. Back of the machine shop is the foundry, engine room, etc. The cupola furnace is of 12 ton capacity, and is lined with fire brick all the way to the top. The blower for furnishing the blast is operated by an independent engine from the other machinery, giving the cupola man perfect control of the blast, independent of the speed of the main engine. The core furnaces are 20 feet long.

The second floor of the building is used for a pattern shop, and has a hand saw, circular saw, lathes and all the necessary appliances. The works have already a large collection of patterns and drawings, which were purchased from the defunct Hope iron works. The third story is used for a pattern room.

The whole building, having been made for a planing mill, is unusually well lighted, and is very airy and well ventilated, there being plenty of room for everything. The drafting rooms are on the second floor, over the office. Several pairs of stairs at each end and in the middle of the building communicate with the different floors.

The outfit in the machine shop is first class in every respect. The tools were all made by Bement & Sons, Philadelphia, and have all the latest improvements. They consist of several lathes, planers, drilling and slotting machines, etc., some of them made for very large work.

Having all the necessary appliances and long experience the proprietors of this shop are prepared to do all kinds of work, large and small; and their facilities are such that they will be enabled to make stationary and compound engines, quartz crushing and amalgamating machines, flour, sugar and sawmill irons, etc., at low figures.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

ALPINE.

Items.—*Monitor-Argus*, Nov. 3: Peter Boyle, an old resident of this county, is about to commence a tunnel down the canyon from the old Henry Clay tunnel of Boulder hill. He has found some very fine sulphurets in feeders leading to the main ledge in the hill. In the old tunnel, run in 1864, a ledge was cut which was four ft in width, that gave promising assays of gold. But owing to the ore being of a refractory nature, the company failed to progress with the development of the mine, and eventually it was abandoned. The old residents of Alpine will remember that a large quantity of those boulders on the hill was worked in arastras, and good results were obtained. Considerable float-rock was found which paid from $20 to $60 per ton. The ore, however, is of a base nature and could not be treated successfully with that process. Since the introduction of chlorodizing and leaching, with the aid of the Frue concentrators, which reduces 60 tons of ore to one of sulphurets, it will most assuredly make mining on the Carson river a success. Mr. G. Hofman's location, the Olympia lode, lies about 1,500 ft south of the Henry Clay. A company has been formed and incorporated at Genoa, Nevada, to develop the mine. Mr. George W. Jones has found some fine specimens of ore, literally covered with gold, in the Alpine Mammoth location on Boulder hill. Mr. Jones has been prospecting by sinking a shaft on the lode. The ore was found at a depth of 40 ft from the surface.

AMADOR.

Items.—*Ledger*, Nov. 1: At the South Spring Hill, operations on a small scale are carried on. The shaft is down 80 ft, with a crosscut 140 ft in length. No quartz has been met with yet, but the projectors are satisfied that an ore body will be struck ere long. Three men are employed. The claim adjoins the Keystone on the south. Reports from the Monro mine say that a valuable body of quartz was struck in the drift this week. The particulars of the strike have not reached us. At the Coney, matters are at a standstill, except the work of retimbering the shaft. Superintendent Rose is in San Francisco, and nothing definite will be known until his return. The Butte Basin Company are putting up a steam pump; the present pump being inadequate to control the large body of water encountered.

CALAVERAS.

Lone Star.—Calaveras *Chronicle*, Nov. 1: A bonanza of surpassing magnitude and richness has lately been discovered in the famous Lone Star mine at West Point—one of the best-known mining properties in the mineral section. Twenty-three tons of ore, crushed in Carlton's mill, yielded 230 ounces of gold, worth $17.50 per ounce. That is an aggregate of over $4,000—a yield of about $174 per ton. It is very rich rock that produces like that, and what makes it more remarkable is the fact that the ledge is fully seven ft in width.

Anonos.—*Echo* contains the following: The Matson claim is situated about one-half mile west of Angels, and is now being worked by the Matson Bros. The vein ranges from four to five ft in width. The ore will pay from $5 to $6 per ton, which, of course, would be considered of a low grade, but with the facilities at hand it will pay very good wages. The arastra claims in Angels are all in operation at present. The Bragg Bros. have sunk their shaft about 23 ft. The vein is about 12 inches in width, and is looking well. This claim has been paying well for the past two years. Potter & Co. are still running two arastras. Their claim is looking well. Findley & Co. are doing well. They have taken out over 150 tons of ore in the past two months.

FRESNO.

Hanover.—*Expositor:* The Hanover mining company has recently made a good strike in their mine at a depth of 150 ft. The find has been followed down about 40 ft, and has constantly improved as the vein is penetrated. At the bottom of the shaft they have an ore body about two ft thick, assays from which give a return of over $100 per ton. The Hanover promises to soon return its stockholders handsome dividends.

New Discovery.—*Expositor*, Nov. 5: T. J. Dunlap and others have discovered an extensive ledge of silver-bearing ore in the vicinity of Goat mountain, on the north side of the San Joaquin river. The ledge has been traced for about five miles. It varies in width on the surface from 4 or 5 ft to 40 and 50. An assay of the ore, made by Price, of San Francisco, gave a return of over $30 per ton in silver. Smith Norris has taken about 50 lbs. of the ore to San Francisco for the purpose of having it tested by working process. If the assay mentioned gives a fair average of the value of the ore, there is enough rock in sight to make millionaires of the discoverers.

Enterprise Co.—The Enterprise M. Co. are taking out of their mine very rich ore. They are now grinding rock in their arastra which yields an average of over $500 per ton. A tunnel is now being run into the mountain with a view of tapping the ledge at a depth of about 300 ft. Should the developments at that depth prove satisfactory, the company will proceed at once to erect a suitable mill for working the ore.

Fine Gold Gulch.—Jas. McCardle, who has just returned from a trip to the north side of the river, says that Wm. Able and partner have located an old abandoned quartz claim near Fine Gold gulch, and are grinding ore in an arastra that yields an average of over $60 per ton. They have plenty of ore that will pay $20 per ton, but they are throwing that aside for the present. In early days McCardle located this same ledge, and now he wishes he hadn't abandoned it.

MARIN.

San Geronimo Mine.—*Journal*, Oct. 30: Rock taken from a vein crossed in the drift last week assayed $46 gold and $3 silver. We believe that no large quantities of rock like the above are yet developed, but the indications are strong that a large body of very rich ore is near.

MARIPOSA.

Air Shaft Completed.—*Gazette*, Nov. 1: The air shaft connecting with the tunnel of the South Hite Gold mining company, at Hite's Cove, is now open, and all hands can now breathe more freely. The air shaft is 160 ft deep from the top to where it intersects the tunnel.

MONO.

Syndicate.—*News*, Nov. 2: During the past week an advance of 16 ft has been made in west crosscut tunnel level; total length, 183 ft. On the 28th inst. a regular quartz seam of low grade, three inches thick, was entered, since which time the rock has been very hard, and progress necessarily slow. The Mexican crosscut from 400-ft station has been extended 21 ft; total, 181 ft. In this crosscut, 10 ft of quite hard rock was passed through. The face of drift is now in vein matter, but no regular ledge as yet. Isabella drift has advanced 22 ft; total length, 211 ft. The Isabella ledge has not been reached yet. The drifts on Taylor vein have been extended 15 ft south and 12 ft north; total length of drift, 148 ft. In the upraise from Taylor ledge 18 ft has been made; total length, 32 ft. The vein in the upraise is 20 inches wide, and looks very promising. South drift on Colcord vein has been extended 18 ft; total length, 106 ft. The upraise is now 28 ft from track floor. This vein has flattened somewhat in going up, but continues strong and is yielding good ore. Commenced stoping out ore with a full force of men yesterday.

Maryland Con.—Stringers of porphyry and quartz are coming in and extending across the bottom of the shaft, making good breaking ground. Loose slips are also encountered, which greatly facilitates sinking. An advance of 45 ft has yet to be run before reaching the 225 level. At this point a station will be cut out, and ore taken out through the crosscut already made from the 250 level of the incline.

Tioga.—Main shaft down 650 ft, three-compartment, timbered in square sets the entire distance. In the east side of the shaft, the rock has changed its character from a hard formation and become softer working ground, with seams and stringers of quartz running through it. This improved appearance indicates the near approach of a ledge.

Noonday.—Joint shaft is down 470 ft. Last week's progress, 23 ft. North drift on No. 1 ledge, 312 level, is in 125 ft. Drift south, on same vein, 92 ft. South drift, on No. 2 vein is in 62 ft. The drift south, on 212 level, 77 ft. Since last report 150 ft of main drifts have been run, besides losing one day, the veins carrying their full size. Water volume is about the same in the shaft, but does not interfere with sinking. About 30 tons of ore are being taken out daily from main drifts.

Mono.—Crosscut east on the 400 level is now in 540 ft, the face in encouraging vein matter. North drift from crosscut on 400 level, along Boyd ledge, is in 165 ft, in good ore all the way, face of drift looking well.

Boots Tunnel.—The tunnel has been advanced 15 ft the past week, making the total length 1,275 ft. On the 30th ult. the tunnel cut a well-defined ledge of gold-bearing quartz six inches in width, which gives good prospects in gold by the horn process. This vein was cut at a distance of 1,270 ft from the mouth of the tunnel, and will undoubtedly prove valuable on further development. This makes the eighth vein of defined quartz cut by the tunnel.

Queen Bee.—Sinking main shaft, which is now 332 ft deep; progress for the past week, 25 ft. The bottom is in fair working ground, and carries a ledge from three to four ft in width of quartz and clay, which return fair assays. The ledge came into the shaft about 270 ft down, and improves as depth is attained.

Red Cloud.—Lateral drift running south has been advanced 30 ft since last report. Face in four ft of fair milling ore, of a soft character. No. 1 chute is up 35 ft, carrying a very large ledge, 12 inches ore. No. 2 chute is up 24 ft. Vein large and regular, and carries an ore streak about one ft in width.

NEVADA.

Mohican Mine.—Nevada *Herald:* Messrs. Reseigh & Co. are having a second crushing of rock from the Mohican mine made at the Pitteburg mill. The first crushing, which was made a short time since, yielded $12 per ton besides the sulphurets, but considerable cap rock other rock was mixed in with the quartz, and it is expected that this crushing will pay much better. They have about 100 tons out, and it is thought that it will yield about $20 per ton. The incline is down 120 ft, but no trouble is experienced from water, as the mine is effectually drained by the Thomas mine. The vein is about 4 ft thick.

Large Specimen.—North San Juan *Independent:* A gentleman down from Rollet Hill lately, informed us that Mr. Henry Frye, of that place, found a giant specimen in his mine at Logan canyon. He was about to throw it out with a fork full of rocks when he noticed that a large piece of gold was among the waste material. Upon weighing it he found it to pull down the scales 27 ounces, or about $500 in pure gold. The piece of gold is about the size and shape of a hot cake.

Hayward Claims.—The past season has been very favorable for the hydraulic miners, because of the excellent supply of water. The Hayward claims at Chalk bluff are running in full blast with two monitors playing against the gravel banks. This is quite unusual at this season of the year. Generally the water supply is exhausted before this time of the year, and the mines are compelled to lie idle for several weeks, and sometimes for months. The Hayward claims are supplied with water by the South Yuba Canal Company and they have kept the water supply continuous except while the ditches were undergoing their annual repairs.

New Strike.—*Transcript:* Wm. Sloan and Thomas Curry, who are sinking a shaft on Deer creek, near the Merrifield, have met with good success, although working but a few days as yet. They have the ledge from the surface down, and two or three tons of ore taken out in sinking to the present depth looke exceedingly well, showing some free gold. They have named it the Julia mine.

Gold Flat.—Among the new claims likely to become heavy gold-producers during the next few months is the gravel claim of W. S. Talbot, at the head of the flat. A force of 15 Chinamen are employed running a drift into the sidehill, the contract specifying that it shall be 1,000 ft in length when completed. They have progressed 100 ft of the way. Six hundred ft of track has been laid to reach the dump. The tunnel is already in the blue gravel channel, and the dirt paye satisfactorily for handling. By the time the lead has been thoroughly prospected, which will take but a few months longer, some big results are most likely to be realized. Mr. Talbott also has some good chutes of quartz on his land, and proposes to soon commence their development on a larger scale than he has ventured heretofore. A. C. Gillespie, whose mine is just across the road from the Thomse property, is taking out considerable fine average ore from the new drift. Ha has several tons of it now on the dump, and practical Gold Flatters think it will pay from $40 to $50 per ton. The rich seam that he found in the ledge recently produced some of the richest specimens ever taken out in the district at a corresponding depth, the shaft being not over 50 ft deep. Hobart & Lord in the same vicinity have a 400-ft drift, and are now engaged in running a crosscut to tap the ledge. This ledge, which has been worked from other directions by them in the past, is in the neighborhood of two and a half ft thick, and is said to have generally paid about $20 per ton.

Bulldozer.—The new steam pump and bolsting works at the Bulldozer mine, located on Deer creek about a mile east of town, had commenced operation. Everything started off smoothly, showing that the machinery was in good condition and had been well put together. An incline was begun last week and sunk to water, 20 ft below the surface, showing a foot and a half ledge of rich ore all the way. The lead slopes gently out under the bed of the creek, and it is on this portion of it that a deep incline will be sunk. Messrs. Rogers and Regan have taken considerable good ore from it since they made the location last summer, having run shafts and tunnels to the south of the present working. The Honsinger brothers, who owned the machinery, have now become associated with them, and the company are going to work the claim for all it is worth.

The Davenport Mine.—*Transcript*, Nov. 2: The bottom of the incline of the Davenport mine on Deer creek is now below the old workings, being down 70 ft where there is an eight-inch ledge of solid ore. Water is coming in, but not so fast that it cannot be readily handled. Tha running of a drain tunnel that will give about 150 ft backs is contemplated by the new owners.

Bonanza Drift Mine.—The property of the company consists of the 635 acres of land situated between the Derbec and Eureka Lake claims. A tunnel is being run from the South Yuba. Including the cut it has now been pushed into the hill a distance of about 80 ft. The formation is of soft slate, making the work not difficult. It is estimated that the gold-bearing gravel lead will be tapped at a distance of 1,200 ft from the mouth of the tunnel, at which place the surface will be 720 ft above, so high is the ridge. The company have some 4,000 ft of canyon, with an average fall of three ft in twelve, so situated as to make a first-class dump. Arrangements are being made to work the claim in an extensive manner, as there seems to be no doubt entertained regarding the whereabouts of the channel.

Derbec.—*Herald*, Nov. 2: Men who are at work in the Derbec mine say that the dirt is very rich where they are at present drifting. In cleaning the bedrock gold can be seen in considerable quantities lying on the face of the rock and in the fissures. About 100 man are employed underground. The new tunnel will probably be commenced next week. Its mouth will be located on the Souchet ground, on the north fork of Humbug creek.

Iron Chad Mine.—Mr. Cammett, the owner, has great confidence in the outlook of this mine. He is making arrangements to increase the number of stamps in the mill to 15, so as to work on a more extensive scale than heretofore. The past year the mine has been well prospected and developed. The incline is down 120 ft, and it is thought that enough ore is in sight to last for two years.

PLACER.

Dutch Flat.—*Forum:* A fine specimen of coarse gold, weighing about $500, was picked up by Chas. Carr, in his Canyon Creek claim, about two miles from town, last Saturday morning. He has several men employed cleaning up the bedrock where this piece was discovered. Several years ago other parties picked up pieces varying from $20 to $30, to the amount of $1,500.

Quartz Mining Items.—Placer *Herald*, Nov. 1: Wm. Pellow, on Bellevue hill, is down about 115 ft, and is taking advantage of the season preceding the heavy rains to sink deeper. His last crushing was over $40 per ton, and his prospects are still flattering. The Trembling Bros., also on Bellevue hill, are down about 115 ft, and are, like Pellow, at present sinking. Their last crushing yielded about $65 to the ton, and that the next will yield any less is not indicated by the prospects. At the old Crater the prospect, it is said, was never brighter. The last 10 days' run panned out between $7,000 and $8,000, and the rock is looking better than ever. Some parts of this mine, it is said, glisten like a jewelry store. The Kaiser boys are prospecting a lead on the hill north of Ophir, between town and the Bellevue. Mr. Geo. Helbrook is prospecting a ledge on the south side of Auburn ravine, a short distance below Ophir. He is down some 40 or 50 ft and has decidedly encouraging prospects. The Pugh mill, at Ophir, is kept running nearly all the time on rock taken out by prospectors, and the average yield is encouragingly high. The Heenan & Molin mine, on Rock creek, now in the hands of E. W. Roberts, is reported as panning out exceedingly well. Other prospectors are doing well in that neighborhood. Heenan & Lawler are reported as having made a good strike.

Item.—A Mr. Anderson, of Dutch Flat, picked up a rock the other day to throw at a cow. The heft of it attracted his attention, and on examination it was found to contain over $100 in gold.

SIERRA.

Prospecting.—*Mountain Messenger*, Nov. 1: The members of the Bald Mountain mining company are at work prospecting for a gravel channel near Nevada City, by running a tunnel and sinking a shaft. In the shaft water has been encountered and the company are putting on an engine. The tunnel is going ahead in soft granite. Chas. Jillson is Superintendent.

Fine Mill.—The Ohio company are erecting a fine mill on the Alaska ledge, at Pike City. The structure is three stories high and has all the modern improvements, including two roasting furnaces. The works when completed will cost about $40,000.

Rainbow Mine.—The Nevada City *Transcript* says: The Rainbow mining company, at Chips' flat, have sunk their shaft to a depth of 210 ft. The vein is from two to eight inches thick, carrying free gold and sulphurets. The sulphurets are of No. 1 grade, having a value of about $70 per ton. Some very rich specimens have been taken out at different times. Altogether the mine has produced about $40,000. A drain tunnel, 550 ft long, from Kanaka creek, drains the mine to a depth of 140 ft. Hoisting and pumping works are being erected, and will be ready to start up soon. Assays of selected specimens from the Rainbow have run as high as $340 a ton, the average of the chute being not far from $40 per ton exclusive of sulphurets.

TRINITY.

Taylor Flat.—*Journal*, Nov. 1: The Trinity Hydraulic G. M. Co. recently organized at Indianapolis, has purchased the Taylor Flat mining property in this county, and have operations already underway for the extensive working of the same. As soon as tools now on the road arrive, a ditch will be commenced from French creek to the mine. It will be nearly five miles in length, seven ft wide on top, five ft on the bottom and three ft deep, and will have over a mile of flume in its length. A sawmill will be erected on French creek to furnish necessary lumber. Messrs. Osborn & Winn have taken a contract for building the ditch, and Mr. Osborn informs us that he expects to have it completed in two months' time.

NEVADA.

WASHOE DISTRICT.

Con. Virginia.—Gold Hill *News*, Nov. 5: The west crosscut from the south drift from the joint crosscut, 850 level, is making rapid progress through vein material carrying streaks of quartz. Ore giving low assays is still encountered in the winze from the 1500 level; total depth of same, 65 ft.

California.—The north drift from joint crosscut No. 1, 800 level, is now in 160 ft and penetrating a good vein formation. The drift north on the 2250 level from the C and C shaft, to prospect the ore vein found on the 2150 level, is in 35 ft and still in hard porphyry.

Con. Imperial.—The south winze is now 92 ft, on the slope, below the 2600 level. It will be pushed with all speed to the 2800 level. The crosscut west, 125 ft from the south winze on this level, is in 20 ft and cutting fine vein matter.

Ophir.—The main incline has now attained a depth of 115 ft on the slope below the 2400 station and is without change of formation. The west crosscut, 2400 level, has its face 105 ft west of the incline and is in a soft and favorable vein material carrying stringers of quartz.

Sierra Nevada.—The drift north from the east shaft is now in 80 ft and in a fine vein formation of clay, quartz and porphyry. The drift east from the same point has encountered a new formation of great promise, but of which little is known since when it was encountered a stream of water burst through a clay slit and the indications of a flood were such that, with present facilities for handling water, it was deemed prudent to suspend operations at that point. Some fine-looking quartz is carried by the new formation and it is certainly a good prospect.

Savage.—The two crosscuts started west Monday—one near the junction of the north drift, 2200 level, and the other 40 ft from the Hale & Norcross line—are each in 12 ft and in vein porphyry. They must increase their lengths to 45 or 50 ft before reaching the ore vein. The mine has cooled off very much of late and since the north header of the Sutro tunnel was connected with the Mt. Hood and Vancouver workings from the Mint shaft.

Justice.—The diamond drill was started to-day to prospect the western portion of the ore vein on the 800 level.

Gould & Curry.—The east crosscut joint with Best & Belcher on the 1700 level has now its face 1510 ft from the main lateral drift, and in hard porphyry.

Mexican.—The joint Union winze is down 175 ft, and in vein matter which carries quartz, and gives considerable water.

Sutro Tunnel.—The north header was last evening 837 ft from the line of the tunnel, and within 50 ft of the Gould & Curry line, and 700 ft from the east crosscut joint with Best & Belcher on the level of the lateral tunnel drift. There have been some fine quartz stringers and seams of crystallizations of lime of late in the face, and the drift is encountering some good-looking vein material. The south lateral drift is now 100 ft south of the Julia connection. The prospecting drifts along the Star lode and the St. John ledge are progressing well and some good low-grade quartz is encountered.

Alta.—The material encountered in the incline below the 1850 level is good ledge matter.

Bullion.—The crosscut, 2400 level, 100 ft from the Alpha line, is being driven ahead as usual and is still cutting the beautiful quartz formation lying there—total length, 54 ft. The double incline winze from the 2150 level is making favorable progress through clay, quartz and porphyry—total depth, 216 ft.

Andes.—The drift north from the crosscut west on the 350 level is in good-looking quartz, as is also the lateral drift on the 450 level.

BELMONT DISTRICT.

Belmont.—The last report in the *Courier* says: The drift running north from No. 2 raise was advanced 8 ft since last report through rich ore; the pay chute is raising

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Pliocene Man.

An interesting review in *Science News*, by Dr. Cherles C. Ahbott, of Prof J. D. Whitney'e chapter on "Human remains and works of art of the grevel series," is of local interest, inesmuch as it refers to discoveries in the auriferous gravels of the Sierra Nevada of California. Dr. Ahbott says: Without doubt, the memoir by Prof. Whitney is the most valuahle and interesting contrihution yet made to the subject of American pre-bistoric archæology. Not only has the topic great interest in itself, hut this phase of it has an additional interest, hecause a portion of the evidence he hrings forward has heen subjected to much adverse criticism, not only hy men of some scientific attainments, hut hy the popular secular and the hiased religious papers of the day. The author, however, effectually disposes of all ohjections, as we think, and clearly demonstrates the correctness of the conclusions he drew, years ago. While being occasionally hinted at in various ways, these conclusions have never heen published *in extenso*, until the appearance of the present volume.

We shall give in hriefest outline the character of the evidence which Prof. Whitney here produces; it does not stand alone, hut supplements and, we believe, confirms the indications of Tertiary men, hoth of Europe and Eastern North America. In his introduction the author remarks, that "gradually the evidence has accumulated from widely separated regions, until the idee of prehistoric man has become familiar to geologists." He then asks, "How far hack can man and hie works he traced?" The memoir eupplies an answer to this question, so far as it relates to California. Any one whe has speut days and weeks in eearching for fossils or stone implements in gravel deposits, can testify how discouraging such work is. Millions of pehhles are to he glanced at and overturned, and often there is nothing hut millions more to look at, when the surface of a hluff has heen removed. In California, where the hydraulic method of attecking the gravel deposits is almost wholly employed, there is still less chance of finding objects of interest than there was in the older method of tunneling. Whetber of hone or stone, traces of man subjected to violent displacement hy streams of water are pretty sure to he destroyed or again buried hy the rapid overturning of the gravel heds.

Much of the material on whicb Prof. Whitney hases his paper has heen collected by Mr. C. D. Voy, and is now in the museum of the University of California. This material has heen gathered principally from Mariposa, Merced, Stanislaus, Tuolumne and Calaveras counties. In Mariposa county stone implements and mastodon remains have heen found intimately associated, at a depth of 12 feet. Much of like nature has heen found in the two counties next referred to, while Tuolumne county is particularly mentioned as a region more prolific in human remains and prehistoric works of art than any other in California. This evidence of early man has heen very carefnlly sifted by Prof. Whitney, and it appears that the fact of the remains heing really found in such positions as to indicate great antiquity is fully demonetrated.

Calaveras county is more fully treated of, as the evidence is of somewhat different character, and has given rise to much discussion. "We now come," eays Prof. Whitney, "to a county where occurrences of human remains do not eeem to have been as frequeut as they were in the adjacent Tuolumne, hut where one specimen has heen obtained which has excited more interest than all the othere put together, and which is popularly helieved to he the only instance of the kind which has heen met with in California. A perusal of the following pages will, however, it ie thought, satisfy the reader that the helief of the existence of man in that region previous to the cessation of volcanic activity there, is not by any means supported hy one item of evidence alone." The history of this "one item," the now celebrated Calaveras skull, is then given in minute detail. Suffice it here to state, that it was found at a depth of 132 feet, and exhihits many peculiarities which tally with the statements of the finder, and are conditions which could only exist in a cranium found as this specimen is said to have heen. This alone, as is most ahly demonstrated hy Prof. Whituey, should eatisfy any one disposed to question the truthfulness of the statements made hy the gentleman who found the epecimen. Were nothing else ever to he found, there ie in thie Calaveras ekull, as we helieve, all that ie necesary to demonstrate the exietence of Pliocene man in California; hut Amador, El Dorado, Placer, Nevada and Butte countiee have all yielded corrohorative evidence. As Prof. Whitney remarks, "the passage from Pliocene through Poet-pliocene, if euch a division can hereafter he maintained in this region, has heen a gradual one, and eome of the Pliocene animals have certainly lived close up to the recent period. That a portion of the human remaine and implements decrihed in the preceding pages are as old at least as Pliocene, it seeme hardly poseihle to douht."

"The discoveriee in California, India and elsewhere eeem clearly to indicate that the human race must have existed, over a large portion of the world at least, for an immense period of time, in the primitive condition, that is, at the lowest possihle stage of humenity—civilization it cannot he called. So far as California is concerned, the evidence all points in this direction. The implements, tools and works of art ohteined are throughout in harmony with each other, all heing the simplest and least artistic of which it is possible to conceive. Whether found in the strata under the hasaltic lava, or above, at any point in the detritus, we always recognize the same type."

The conclusions of Prof. Whitney'e volume are as follows:

"*Finally*, as the summing up of the discoveries and investigations made hy the Geological Survey in California, we have:

"1. The clear and unequivocal proof heyond any possibility of douht or cavil, of the contemporary existence of man with the mastodon, fossil elephant, and other extinct species, at a very remote epoch as compered with anything recorded in history.

"2. That man, thus proved to he contemporary with a group of animals now extinct, did not essentially differ from what he now is in the same region and over the whole North American continent.

"3. That there is a large hody of evidence, the strength of which it is impossihle to deny, which seems to prove that man existed in California previous to the cessation of volcanic ectivity in the Sierra Nevada, to the epoch of the greatest extension of the glaciers in that region, and to the erosion of the present river canyons and valleys, at a time when the animal and vegetahle creations differed entirely from what they uow are, and when the topographical features of the State were extremely unlike those exhihited hy the present surface.

"4. That man existing even at that very remote epoch, which goes hack at least to the Pliocene, was still the same as we now find him to he in that region, and the same that he was in the intermediate period after the cessation of volcanic activity and while erosion of the present river canyons was going on.

"5. That the discoveries in California and those in other parts of the world, notahly in Portugal and India, present a etrong body of evidence going to prove the existence, during an immensely long period, of the human race in its primitive condition—that is to say, in the simplest and rudest condition in which man could exist and he man.

"8. That, eo far as we know, there is no evidence of the existence of any primordial stock from which man may have heen derived, so far hack at least as the Pliocene. Man, thus far, is nothing hut man, whether found in Pliocene, Post-pliocene or recent formations."

That some of these conclusions, here so positively stated, may he modified hy future discoveries, is highly probahle. Especially as to the discovery of some "primordial etock," do we think this to he the case. That such stock once existed is necessarily true; that all trace of it has vanished is improhahle; and not earlier than the dawn of the Pliocene is it necessarily needful that one should go to seek for such traces. The Pliocene epoch was not a matter of a few years, and what the formations of that age, in other contineuts, may contain that shall throw light on man's origin, have yet to he gathered. When the Pliocene strata of Africa and Asia have heen carefully examined, and they are found to contain no traces of man more primitive than those of California and elsewhere, then it will he proper to expect that such traces will he found in the Miocene. That unquestionahle traces of the missing link are now resting in eome tertiary deposits, we have not the shadow of a douht.

River Surveying Party.—The float known as "Noah's Ark," which was hauled upon the sands across the river opposite Tehama last Saturday and put upon a temporary dry dock for repairs, was again launched Wednesday last. Prof. Le Conte with 16 men are surveying the river and taking soundings, for the purpose of getting exact information where the channel is choked either hy snags or sand hars. Their hoat contains the sleeping apartments for the crew and kitchen and dining room. They will prohahly he two months on the river hefore reaching Sacramento city; they are now a few miles helow here examining the rapids hy the island. In some places in order to give sure channels all the year round, Prof. Le Conte said it would he necessary to huild dams and gates. The work ie a good one and we hope their report will he such as to secure the appropriation necessary to do the work required to open this natural highway.—*Tehama Tocsin.*

Fire Producing Frost.—A few daye since, while observing the action of his new absorption refrigerating machine at Ruppert's hrewery, Ninety-second etreet and Third avenne, New York city, Mr. T. L. Rankine casually placed a lighted candle against the expanoion pipe leading from the liquid receiver. His intention wae to melt the froet from the pipe; hut to his eurprise the effect was quite the opposite, frost forming within the flame much more rapidly than on other portions of the pipe. He afterward ohserved in the cellar he was refrigerating that direotly over the hurning gas jete the frost on the pipee along the ceiling wae whiter and more ahundant than elsewhere.

During the paet 16 yeare, the Territory of Montana hae produced $153,000,000 in gold and eilver, of which $147,000,000 was in gold, making that Territory eecond only to California in the production of gold. There are now 20,000 quartz mille in the Territory.

Peculiarities of Alaska.

It would appear from the interesting letters to the *Bulletin*, written hy John Muir from Fort Wrangel, Alaska, that the operations of nature's works in the formation of a hahitahle region, may he witnessed at the present time in the Territory of Aleska. In regard to the age of Alaska, Mr. Muir saye:

From the universal distribution of the woods, one would he led, at first eight, to suppose that Alaska was an old country, considered with reference to its regeneration at the close of the glacial period, and that it hed heen long exposed to the disintegrating action of post-glacial forces, and had thus heen covered with soil and then planted with trees. But, on the contrary, Alaska is a very young country, and its forests are mostly set on solid rock that had just emerged from heneath the ice-sheet. The existence of forests on so hare a surface is possible only in a wet and temperate climate like this. As soon as the ice leaves the rock it is covered with moss, a deep, bossy hlanket of it, in which the tree-seeds find lodgment, and grow and weeve their roots together iuto a sod, so that one supports the other, and thus with a little anchorage here and there iu fissured spots they are enahled to stand on steep slopes, even without any soil about their roots, or covering of any sort, save the damp mosses. On the very eteepest and smoothest declivities the whole sod of trees will at timee give way and slip down in a heap to the foot of the wall. But on the ruins another and another growth ie huilt, until the whole is covered. One has only to go to the hanks of the existing glaciers to see this forest work done.

Give to Alaska the climate of California, and these evergreen islands and shores would be treeless, sun-heaten rocks.

The forests are peculiar, and especially in Southeastern Alaska, their hulk is made up of three species of evergreens, all of which are of good size, and grow close together, covering almost every acre of the islands, however rocky, and the margin of the coast and the mountain slopes up to the hight of ahout 2,000 feet.

The most important of theee as to timher is the yellow cedar, or cypress *(Cupressus nutkatensis)*, a truly nohle tree, attaining a hight of 150 feet, and diameter of from 3 to 5 feet. The hranchee are pinnate, drooping, feathery, dividing into heautiful light green sprays, like those of the California lihocedrus, hut with finer foliege and more delicete plumes. The wood of this tree is undoubtedly the hest the country affords, and one of the most valuable to he found on the whole Pacific coast. It is pale yellow, close grained, tough, durahle, and takes a good polish; and to these qualities is added a pleasant fragrance, like that of sandal-wood. Some little goes to Chine, and is made into fancy boxes, it is said, to he returned to us for camphor wood. It is the favorite firewood of the coast region, but au open hearth must he closely screened with a framework of wire netting, as the wood in hurning snaps, crackles and explodes, throwing out such a shower of glowing coals that there would he danger of fire without protection against them. The durahility of this timher is forcihly illustrated hy the fallen trunks lying in the damp woods. Many of the largest of them last for centuries, retaining even the delicate color and fragrance unimpaired. Soon after they fall they are overgrown with moss, in which seeds lodge and germinate and grow up into vigorous saplings, etanding all in a row on the hacks of their dear ancestors. As they grow larger they stand astride, sending their roots down and out on hoth eides like the etraddling legs of a spider. And, after they have reached an age of several hundred years, the downtrodden trunk when cut into will almost always he found as fresh in the heart as it was when it fell. Decay goes slowly on from the outside, never commencing in the heart-wood, as far as I have noticed, though a good many of the living trees are injured by a fungus which produces a dry-rot similar to that found in thuja and lihocedrus. The species is found es far south as Vancouver Island, and is pretty generally distrihuted along the coast and through the islands, as far north as Sitka.

The white spruce, or Sitka pine *(Abies Menzesii)* ranks next in value as to its timher, while it is far more ahundant than the first. Perhaps one-half of all the individual trees in eoutheastern Alaska helong to this species. In the heaviest portions of the forest it growe to a hight of from 150 to 175 feet, with a diameter of from 3 to 6 feet, and in hahit and general appearance resemhles the Douglas epruce, eo common ahout Puget eound. It ie eomewhat leee slender, however, the hranches cover a larger portion of the trunk, and the needles, radiating all around the hranchlete, are etiffer and so eharp-pointed that the younger hranches cannot he comfortahly handled without glovee. The timher is tough, close-grained, white, and looks much like pine. It splite freely, and for general house huilding takes the place of pine.

The other speciee ie the heautiful hemlock epruce *(Abies mertensiana)*. It is more slender than its companion epecies, hut nearly ae tall, and the young treee are more graceful in hahit, hut the timher is inferior, and though very ahundant is eeldom made use of for any purpose where any other may he had. Of the other speciee found in theso forests, hut forming only a small portion of the whole, the most noteworthy is thegrand arhor vitæ (*Thuja gigantea*), called red cedar hereahouts. It ie distrihuted all the way up the coast from northern California, to ahout latitude 56°. From the soft, easily-worked holes of this tree the Indians make their canoes, eome of them large enough to carry 50 or 60 men. A specimen nihhled out of a single log cut on the west coast of Vancouver Island is 60 feet long, 8 feet wide, and 4 feet deep.

Of pines I have seen only one species *(P. contorta)*, a few trees of which, 50 or 60 feet high, may occasionally he found ahout the opsn edges of lakes and hogs. In the interior, heyond the mountains, it forms extensive forests. Cottonwoods, two or three feet thick, and from 40 to 60 feet high, grow on heds of flood-soil along the hanks of the larger etreams.

A fir like *Picea grandis* is common on the mouutain slopes of the mainland. It is usuelly quite small however, seldom found to exceed a hight of 60 or 70 fect, and the timher is of a very inferior quality. And up on the cold canyon sides along the hanks of the glaciers, there is a very handsome little spruce like the Williamson of the upper forests of the Sierra. The only hardwood I have seen in Alaska is alder, meple, wild apple and birch—one species of each. The hirch grows mostly on steep declivities well hack in the Coast range in company with spruce and fir. The largest specimens ere ahout 40 feet high and a foot thick. The other species are found only ahout the margine of the main forests. The trees are quite small, mostly ahout eight or nine inches in diemeter or less.

It appears, therefore, thet, with the important exception of the yellow cedar, timher trees for every use, as good or hctter in quality, ahound in California, Oregon, Washington Territory and British Columhia, while those sources of supply are also nearer the markets of the world. And it will only he after those ere exheusted on the more eccessihle portions of the coast that these grand Alaska forests will to any considerahle extent he made available. Seward expected Alaska to hecome the ehipyard of the world. So it may a century hence. In the meantime this supply will keep. These Alaska forests are not threatened with fire, or any other destruction dependent on the agency of man. They are too wet to hurn. I have never yet seen a trace of fire in all these woods. The roots are set in a deep spongc of wet mosses, kept saturated by the ahundant rains that fall throughout all the seasons, so that running fires are impossihle here while the climete remains as it is. Bsyond the mountains in the interior forests thc conditione are different—less rain and greeter summer heat—so that these woode ere oftentimes ecourged with fires as destructive as those that sweep the foreet helt of the Sierre. In the vast region drained hy the Yukon the principal tree, according to Kellogg and Dall, is the "white spruce" *(Abies alba)*. I saw it on the Arctic divide, neer thc heedwaters of the Yukon. It is an exceedingly elender tree, spiry, erect and closely cled with ehort, leefy sprays, forming the sharpest and most arrow-like spires I ever saw in any forest. The tallest are ahout 125 feet high. Some of this inland timher may sometimes he made availahle for ehip spars hy floating it down to tide water; hut centuries will prohahly elapse hefore this time of need will come.

The coast and island foreste of this south end of Alaska wear a grayish hrownish color in the foreground, hlack in the middleground and dark hlue in the distance. The gray and hrown is derived from lichens that depend from the hranches, and from mosses that grow not only on the holes, hut from large nest-like masses on the horizontal palmate portions of the main hranches 50 or 100 feet ahove the ground. It is only where snow and rock avalanches have occurred that a hright grass-green is seen.

Landing almost anywhere to take a walk in these woode you have first to fight your way through a fringe of hushee tediously intertangled—ruhus, huckleherry, dogwood, willow, elder, etc., and a strange looking woody plant ahout six feet high, with limher, rope-like stems, and a head of hroad leaves spread out horizontally like those of a palm. Both stem and leaves are covered with keen spires, eo that it is impossible to gresp it anywhere without getting a multitude of thorns in the flesh. This is *Echinopanax horrida*, popularly known as the Devil's Cluh, and used hy the Indians to thrash witches—the most truly diaholical thrashing instrument conceivahle. It is the only plant that eeems out of place hear. It seems, rather, from its vine-like leaning stems and heads of ample transluscent leavee, to helong to the tropica. Back in the shady depthe of the woode the ground ie covered with a thick felt of moesee, hut little roughened with hushee of any kind, and not a track will yon eee of hird, heast or man on thie yellow elastic carpet, not even those of the deer or hear that inhahit these woode.

A copper helt, eome two milee long, and from 200 to 400 feet wide, hae heen discovered ahout the middle of the eouthern part of Maine, directly on the coast. Some 20 miles to the northward of thie copper belt, eilver has heen found in flakee, maesee and filameute. A ehaft hae heen eunk eome hundred feet deep, and it ie reported that the ore increaees in richness with the depth.

It ie reported that tellurium, aseaying as high as $65,000 a ton, has heen discovered ahout 25 miles west of Canyon City, Colorado.

THE ENGINEER.

Engineering Feats.

After ten years' labor, and after an outlay of more than $6,000,000, the famous Sutro tunnel has been opened, and in eight hours it had lowered the water in the long drowned-out mines more than 100 feet, and rendered them accessible to work. The great Tehachipichi railway tunnel is near its completion. The great tunnel at Hoosac is in use. Captain Eads has received the indorsement of the United States engineer at New Orleans that he is entitled to half a million dollars for having completed his project of deepening the navigation of the Mississippi by a system of jetties that would keep the river open and insure its commercial standing. There are other equal schemes in progress, all of which are intended to relieve the transportation or assist the industry of the country. Now it is proposed to obviate the difficulties of Isthmian navigation by a railway capable of transporting the largest vessel from sea to sea, while various plans for tunneling or canaling that impracticable strait are considered.

It would be easy to extend this brief catalogue of some of the great engineering feats of the country within the last few years, not the least among which is that which gives access to New York. But the instances which we have cited suffice. They show the grandeur of the attempts, their practical use, the enormous sums involved, the impediments met and to be met, and the success of American scientific labor. They are very interesting, because they are in the alphabet of a science whose calculus we do not know, and whose European parallels, shown in the Thames tunnel, in the St. Gothard and Mt. Cenis passes, in the Suez canal, in the projected tunnel between England and France, and in that from Spain to Africa, compel scientific notice everywhere. It is not singular that for so long a period Europe should have held the van in this department. The population there is denser, the commercial wants are much greater, the capital is more enormous, labor is cheaper, and political agree with industrial wants. Here, however, the schemes are scarcely if at all less gigantic, the costs are equal, the uses are not less, and coming advantages connect with present desires. The wonder is that our science ventures upon such essays, and is sustained by such capital; that such a great forecast is indulged in when the moment is unpropitious, and there is such a uniformity of success. The credit is reflected in equal proportions upon the ability which plans and the business which dares to execute.

And these are all engineering feats—feats of that very power which is to-day rendering the Delaware as navigable as the Thames or Mersy, which is boring through Eastern as well as Western mountains, and separating our peninsulas. Our advantages are being realized and our possibilities attained, so that when the century has closed we shall hold a far different position to the world, relatively and positively, from that which is now ours.—*North American.*

IMPROVEMENT OF THE CANAL SYSTEM.—The network of canals in France, which has already reached a high state of development, is about to be largely supplemented and improved. A law passed August 5th last sanctions a comprehensive scheme for the reduction of all existing lines to a uniform plan, and for the opening up of a large number of new canals. This law divides the existing waterways into main lines, which are placed under the exclusive management of the State, and branch or secondary lines, which may be opened and worked by private individuals or companies, with or without a State subvention. Article 2 fixes the minimum dimensions of the main lines (to which class all the existing canals of any importance may be said to belong), and enacts that all locks shall be at least 5½ meters wide by 38½ meters in length, with a water depth of 2 meters. The importance of the establishment of a uniform scale throughout the country can hardly be over-estimated when it is remembered that hitherto the canals have been cut with reference to local requirements only, so that the boats of one district were often unable to utilize the waterway of another, and the transshipment of goods under passage into smaller boats became necessary, involving much expense and loss of time. The wonder is that under such unfavorable circumstances the traffic has remained so considerable as has been the case. The law of August 5th not only provides for the improvement of canals already existing, but also decrees the institution of ten new main lines and eleven new subsidiary lines, the total expense of which are estimated at 930,000,000 francs. Among the new lines are a canal from Havre to join the inner system, a shorter route from the Belgian frontier to Paris, a canal from the Scheldt to the Maas, another from the Upper Marne to the Saone, and a line thence to Doube.

METAL STAGE CURTAINS.—While Wagner's "Nibelungen" was being performed at Munich, recently, the drop-scene took fire. Happily there was a metallic curtain which separated the stage from the auditorum, and this was immediately lowered. After some little interruption, the fire was extinguished, and the actors went through the piece in the midst of the charred remains.

USEFUL INFORMATION.

Brass.

Corinthian brass was said to be a mixture of gold, silver and copper, formed by the running together of statues, melted in the flames of the city of Corinth, when it was burned by its Roman captors. It brought a very high price for generations afterward. The name "brass" was commonly applied among the ancients to what is now known as bell or gun metal, a mixture of copper and tin. The alloy of copper and zinc was known and used ages before the mixture of the latter metal was discovered; and it is even said that the use of brass was discovered before that of iron. A mass of zinc ore, mingled with charcoal and plunged into melted copper will yield the metal, which will be at once dissolved by the copper. This was the ancient process, the only one till 1781, and is still in use. Modern modes consist in melting the zinc and adding copper in thin strips, or in a fused state; or in melting copper and plunging into it lumps of zinc, held below the surface with iron tongues. At the temperature of melted copper, zinc is very apt to evaporate, and despite layers of fine charcoal or glass on top of the fluid metal, so much zinc passes off that chemical analysis alone can determine the proportion of each metal in the product. The usual proportion is a pound of copper to eight ounces of zinc. "Prince's metal," a beautiful yellow combination, contains equal weights of each ingredient. "Muntz's patent sheating, or yellow metal," is made of about two pounds zinc to three pounds copper. Batb metal, Pinchback, or Manubeim metal, is made of three or four ounces zinc to a pound of copper. The addition of zinc hardens and whitens the copper. Oreide is also a combination of copper and zinc in the ratio of 100 to 17. Brass can be precipitated from a solution of sulphurets of the two ingredients mixed with cyanide of potassium, by using a galvanic battery with a brass plate attached to the negative pole.—*N. Y. Mercantile Journal.*

Mineral Oils as Lubricants.

At a late meeting of the Railway Master Mechanics' Association of the United States, there was rendered a report of a committee appointed to examine into and report on the subject of lubricants. They recommended a good quality of natural earth oils as the best to use for lubricating machinery and journal boxes. It was less expensive, and of a better quality than other oils. When treated so as to reach 28° of gravity, it was found to work with perfect success, even on so sandy a road as the Lake Shore. It had been reported favorably on from Canada in the north to Kentucky in the south. A test of various oils had been made with the oil tester on the Lake Shore road; sperm, lard and tallow were used, and none of them were found to possess qualities which render their use advisable. In their experiments the committee used a machine the size of a regular axle box, and 50 drops were poured in at a temperature of 60°, and the wheel was allowed to revolve at a rate of speed equalling 35 miles per hour, until a temperature of 200° was reached. The length of time, number of revolutions and amount of friction were all noted and placed in the form of a table. Attention was called to the result obtained from tests with paraffine, which costs from 25 to 30 cents per gallon, and which has been used on railroads in preference to lard oil. Paraffine costing 25 cents, with which six experiments had been made, showed that 24 minutes were required to reach the maximum temperature, during which time it gave 11,685 revolutions; castor oil, costing $1.25, which required 28 minutes to reach the temperature allowed, gave 12,946 revolutions; manufactured oils, A, B and C, costing 35 cents, 90 cents and 25 cents respectively, required 19½ minutes, giving from 9,285 to 9,653 revolutions; sperm and tallow required only 17 minutes to reach 200° temperature, with less than 8,000 revolutions.

CHEAP BLACK FOR WOOL.—The cheapest black for wool is obtained by treating the wool in a mixture of dilute sulphuric acid and dichromate of potassium, or of sulphuric acid, potassium dichromate, potassium bitartrate and copper sulphate, and subsequently dyeing with logwood. Reimann now proposes to use, instead of either mixture, one of chrome-alum and bitartrate with logwood. For the chrome-alum, the impure solutions of it obtained as lye-products in many manufactures may be used. The iron-alum in this process not only serves as an oxidizing agent, taking the place of chromic acid and copper sulphate in the first two mixtures, but also deepens the black by itself forming a compound with the logwood. The advantages of the new process are: (1) there being no chromic acid in the mixture, the wool is not oxidized, and remains soft to the touch; and (2) the black is a mixture of chrome and iron-black, and while free from the drawbacks of either, possesses the good qualities of both. Chrome-black is unaffected by acids, but is injured by alkali and exposure to light; iron-black has exactly opposite properties.

CAUSTIC ALCOHOL.—Dr. B. W. Richardson, of London, prepares this alcohol as follows: Take one-half fluid ounce of absolute alcohol in a two-ounce test tube. Set in a water bath at 50° F. Add gradually small cuttings of clean metallic sodium until hydrogen gas ceases to escape. Then raise the temperature to 100° F., and add a little more sodium, or until the gas again ceases to rise, stopping if crystallization occurs. Cool to 50° F., when the preparation thickens. Add one-half fluid ounce of absolute alcohol (for the strongest caustic to apply), or more, as needed for the use desired. Two parts of absolute alcohol will require one part of pure sodium to make the absolute sodium alcohol. The sodium alcohol is diluted, according to the end to attain, *with absolute alcohol*, and "can be used so as to cut like a knife," or so as to serve as a mild caustic, little more than a very sharp stimulant. Dr. Richardson considers one part of the sodium alcohol to one and a half parts of the absolute alcohol as the strongest caustic safe against causing hemorrhage, for vascular parts. The preparation will dissolve opium and nearly all substances soluble in alcohol.

A NEW DISCOVERY.—A German scientist, after years of study and experiment, has succeeded in obtaining a chemical composition by means of which a mirror image may be fixed and sold as a photograph. With this composition the mirror surface is painted, and the back part of the mirror receives also a coating of oil. The mirror thus prepared is held before the person who is to be photographed. The oil coating evaporates, and the likeness of the person remains in natural colors on the light surface. The image so fixed is brought into a bath and is exposed half an hour to the sun-light before delivery.

GOOD PASTE.—Herr O. Heim, of Grimmen, gives a recipe for marking a durable paste. He takes 20 grammes of wheat starch, and makes it into a stiff paste with a little cold water; then he pours 100 c. c. of boiling water all at once—not gradually—into this paste, and stirs it rapidly. A little carbolic or salicylic acid is then stirred in, and a paste is obtained which will keep indefinitely (or at any rate until it dries up) in a cool place. Care must be taken to have the best starch, as good paste cannot be made with the inferior kinds.

GOOD HEALTH.

Comparative Mortality of Rich and Poor.

Dr. Drysdale, Senior Physician to the Metropolitan Free Hospital, called attention in the Social Science Convention, recently in session at Manchester, England, to the comparative mortality of rich and poor. How came it, he asked, that in Great Britain, in the face of improvements in every direction in the domain of hygiene, there still remains a death-rate in our cities ranging from 30 down to 20 per 1,000 of the population annually? If we look to one city, London, for instance, we find that, with all the advances recently made in that wonderfully healthy city, the death-rate was actually 22.2 per 1,000 in 1856, and in 1876 a little higher, or 22.3. Many persons have asked, on reading such figures, "What is the use of medical science if it can effect nothing more than this?" The real cause of the non-effect of the countless hygienic advances was indigence. Villerme, the French medical writer on hygiene, found some 30 years ago, that persons over 40, if in easy circumstances, had a death-rate of only 8.5 per 1,000, whilst the mortality in a similar class among the poor was more than double, or 18.7. He also showed that in Paris, there died, between the years 1817 and 1836, 1 inhabitant in 13 in the 13 arrondissement, chiefly inhabited by the poor, and but 1 in 63 in the second or rich quarter.

The most accurate statistics ever compiled on this subject are from the pen of C. Ansell, Jr., entitled, "Statistics of Families of the Upper and Professional Classes," published in 1874. The author collected information concerning 48,044 children of the well-to-do classes in England and Wales, including members of the legal, clerical and medical professions, as well as that of the nobility and gentry. He found, from these inquiries, that in the first year of life, only 80.45 per 1,000 deaths occurred among the infants of the easy classes in this country, as against 149.49 among the children of the general population. The death-rate then, of the children of the comfortable classes being 80 per 1,000 in their first year, we found it to be 240 per 1,000 in cities like Manchester and Liverpool, and as high as 300 in the poorer quarters of our cities, and in Berlin actually 500. From one to five years of age, 46.84 children of the upper classes die of 1,000 born, and as many as 113.69 in the general population. During the remainder of early youth from 5 to 20, the difference is not marked; but 65.47 per 1,000 deaths occur among the richer classes, as against 74.04 in the general public. Between 20 and 40 there die among the richer classes, 125 per 1,000, and 124 among the general population; and between 40 and 60 there die 147 per 1,000 among the rich against 168 among the general population. The general result of this calculation shows that the average age at death is among the rich in England and Wales 55 years, whilst it is not probably 35 among the artisan class; so that Mr. Ansell estimates that in one year there die in England and Wales under the age of 60, 368,179 persons, which figure should only have been 216,048, if the population had all been in easy circumstances. Thus some 142,000 deaths annually in England and Wales are due to indigence. Health is very imperfectly secured in the lower grades even of respectable citizenship. The public registers have demonstrated that mortality and diseases diminish with every rise in the scale of wealth.

The Physiology of Recreation.

So much, then, for the meaning of recreation. The next point that I shall consider is the physiology of recreation. It may have struck some readers as a curious question, why some actions or pursuits should present what I may call a recreative character, and others not. For it is evident that this character is by no means determined by the relief from *labor*, which these actions or pursuits secure. A week on the moors involves more genuine hard work than does a week in the mines, and a game of chess may require as much effort of thought as a problem in high mathematics. Moreover, the same action or pursuit may vary in its recreative quality with different individuals. Rowing which is the favorite recreation of the undergraduate, is serious work to the bargeman; and we never find a gardener to resemble his master in showing a partiality to digging for digging's sake. If it is suggested that it is the need of bodily exercise which renders muscular activity beneficial to the one class and not to the other, I answer, no doubt it is so partly, but not wholly; for why is it that a man of science should find recreation in reading history, while an historian finds recreation in the pursuit of science, or why is it that a London tradesman should find a beneficial holiday in the country, while a country tradesman finds a no less beneficial holiday in London? The truth seems to me to be that the only principle which will serve to explain the recreative quality in all cases is what I may call the physiological necessity for frequent change of organic activity, and the consequent physiological value of variety in the kinds and seasons of such activity. In order to render this principle perfectly clear, it will be necessary for me very briefly to explain the physiology of nutriton.—*George J. Romanes, in Popular Science Monthly for October.*

ACTION OF SEWER GAS ON LEAD, ETC.—The sanitary inspector of Dundee, Mr. T. Kinnear, has watched the effect of the gas on portions of the zinc eaves of buildings where it was striking on the under part, and found, in the course of a couple of years or so, pretty large holes eaten completely through, showing that material could not long withstand the effect of the gas. Lead is, of course, more durable than zinc, but the difference is only a question of degree, as shown by the fact, in not a few of the water-closets repaired by the officers of the department during the year, small apertures were found in the main vertical lead pipe, and in the cross or horizontal one leading from it to the trap of the closet various perforations were found on the top, indicating clearly the operation of foul air from the drain. Lead traps and soil pipes from water-closets, baths and fixed basins are all subject to wear and tear; but the traps, being burdened with the additional strain of barring the passage of sewer gas, do their work less efficiently, and for a much shorter period, than they are generally credited with, hence, the necessity for proper ventilation and occasional inspection.

NEW CLOTHING MATERIAL.—A Berlin inventor has patented a new kind of cloth, which consists principally or entirely of sponge. The sponges are first thoroughly beaten with a heavy hammer, in order to crush all the mineral and vegetable impurities, so that they can be easily washed out. They are then dried and pared, like a potato, with a sharp knife, the parings being sewed together. The fabric which is thus obtained is free from all the danger which sometimes arises from the absorption of poisonous dyes into the system; it absorbs without checking the perspiration, so as to diminish the danger of taking cold; it is a bad conductor and therefore helps to maintain a uniform surface temperature; it can be more readily cleansed than the ordinary woolen garments; its flexibility diminishes the liability of chafing; the ease with which it can be employed in shoes, stockings, drawers, undershirts, hat-linings and other articles of clothing seems likely to make it especially useful as a protection against rheumatic and pulmonary attacks.

A NEW THERAPEUTIC AGENT.—A new method of treating cancerous growths, tumors, etc., consists in subjecting the parts to a stream of hot, dry air. This is proposed and has been successfully applied by Dr. G. A. Keyworth, of England. By means of a foot-bellows he caused air to pass through a glass vessel containing calcic chloride, then through a heated iron tube, and thence directed the hot, dry air against the surface of a cancerous sore. The treatment was continued for an hour, the effect being to relieve the pain and cause the parts heated to shrink and dry up very considerably. It is believed that this new method will prove valuable when proper appliances are employed to maintain and direct the supply of the air.—*Scientific American.*

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Dividend Notice—Belle Isle M. Co.

The Week.

The line of demarcation between skilled and unskilled mining is gradually becoming obliterated by the spread of information which is rapidly placing mining upon a scientific basis. A reference to our "Mining Summary" for the week will show continued activity in prospecting, and with good results springing from a more accurate knowledge of indications. A railroad to Bodie is on the cards, and it goes without saying that means of transportation will add an impetus to the mining interests which the resources of Mono county justify. The mines of Alaska are becoming important, from the fact that closer investigations of the mineral resources of that Territory have been made. Important results are said to have been obtained in Nevada county by the Gould process of oxidation and amalgamation at Meadow Lake, and by the Smith process at the Murchie mine, at Grass Valley, which is the last aspirant for favor in the way of reduction of sulphurets by amalgamation. The hydraulic mines are preparing extensively for the coming rains, which promise to be sufficient for satisfactory working.

Our mines are exciting the attention of English capitalists who continue to seek investments. Our English exchanges are disposed to favor the investment, although warnings are uttered that there must be fair dealing. We are induced to believe from present developments that the days of bare-faced swindles in mines are over.

The labors of the Land Commission have continued, and if there be no other result than to arrive at the bottom facts regarding the debris question and general land questions, its labors will not have been in vain. Clearer ideas in regard to the legal features which should cover these important points are being made manifest; and if a millenium cannot be predicted in the near future, we may hope that the reign of common sense, its forerunner, will soon assume the scepter.

The Element of Shrewdness.

The practice of driving sharp bargains may certainly be regarded as a universal peculiarity of men in their business ventures. History abounds in instances of the sharpest dickerings among all nations, barbarous as well as civilized, from the bargain and sale of a kingdom down to common transfer of a horse, and the shrewdness of either party to the transaction is gauged by the advantages derived from the result of the exchange or transfer. Dispossessed of trickery or swindling the element of shrewdness is a laudable characteristic of any business, but when accompanied by intents and appearances calculated to deceive the unwary the transaction no longer deserves the nomenclature of shrewdness, but becomes a downright fraud; and instead of redounding to the credit or enuring to the benefit of him who perpetrates it, a positive injury is accomplished which affects the whole range of subjects embraced by the transaction. An individual once swindled, if of a confiding nature, realizes an entire change in his disposition, and condemns not only the swindler, but all others in the same line of business, as well as the business itself. The reason is all men who have money to invest are not philosophers, and do not care to investigate the morality of future transactions. The more any particular business depends upon mutual confidence, the greater will be the injury caused by any deception. In staple articles the defrauded party has his remedy by forcing the defrauded to exchange for a satisfactory one, or he can purchase elsewhere, and to that extent lessens the business of the deceiver, and thus the individual only is deprived of his trade. But where the very nature of the transaction lies in its qualities as an apparently good investment, every deception is attended by a loss to the whole of that class of business and effects the whole of a community engaged in it. Of this nature is the mining business. Men do not invest in mines through necessity, but only because it is believed they will make good investments, and every mining swindle, on this account, affects the whole region where the ore less mine is located. The vendor gets away with his swag, and the vendee is left remediless, a victim of false representations and misplaced confidence. The individual who fails to give another a *quid pro quo* for his money is too often regarded as shrewd in a degree proportioned to the amount he gets as the price of his dishonesty. Looked at from a purely human point of view the transaction possesses neither shrewdness nor business tact. Shrewdness and business tact look to future advantages as well as to present gains, and to kill the goose that lays the golden egg is so silly, though common a proceeding, as to merit not even the censure of a schoolboy's intelligence.

The London *Mining World and Engineering Record* of October 4th ult., gives utterance, under the heading of "American Mines," to some solemn truths which it were wise for every present and prospective American miner to ponder, especially at this time, when the course of conduct to be pursued by them may make or mar the future of our mining prospects in general. We have the mines of gold and silver against which the world cannot compete, but we need the capital to work them. With millions in sight, so to speak, millions more in cash are required to utilize the glittering metal. This cash is capital, and coming from whatever source it may, it deserves at least to be met with a spirit of honesty and fairness, or else the scepter of empire so long expected will be still longer in coming this way. So far as regards English investors, the past has demonstrated their desire to aid in the development of our mineral resources. They do so, of course, for the profits to be realized. Can they or any other capitalist be expected to invest for any other reason? To show what has been done for their encouragement we have only to cite the Emma, the Flagstaff, the Last Chance, the Tecoma, the Utah, and others that might be named. The results of these swindles have nearly given the *coup de grace* to the floating of any more mines upon the English market. If English investors are to be induced to contemplate American mines again, and we presume we may say that that there is no desire to prevent them on our part, they will only do so under very altered conditions to those which formerly prevailed. As our exchange says:

"They are not indisposed to face the risks of mining in America any less than they are those which attend that operation here, but they will not certainly allow themselves to become the dupes of unscrupulous vendors, who, when they have got their plunder, leave the ship to its fate—if, indeed, they do not try to scuttle it as their parting act. There seems to be a tacit understanding on this side of the Atlantic (of which the Americans would do well to take heed), that for the future closer bargains must be made with vendors than heretofore, both as regards purchase-money and the throwing of their shares upon the market. Under the old system the vendor received a considerable sum in cash, and then his sole object was to keep up the price of the shares in the market until he had disposed of those he had obtained as part of the purchase-money. Then, as we have said, he left the concern to its fate. Sometimes he was not even so kind as this, but afterward hampered its proceedings, attempted to upset its title, and even to regain possession, by the most unscrupulous means, of the property for which he had been paid so well. As a matter of fact, one or two, or perhaps even more of these individuals are to-day in actual possession of the properties they once sold, and probably when the times are favorable will attempt to float them again under different names and with their own identity carefully concealed."

It may be a "good joke" to circumvent foreign capitalists, but the joke is altogether of too practical a nature to be useful. We have more good mines than can be fully developed for a century to come, and there is, therefore, no occasion for throwing poor ones on the market. Let us be careful and make no mistakes.

Hints to Miners.

The disadvantages under which many of the mining fraternity labor are frequently aggravated, not only by the lack of proper appliances to aid in his prospecting, but also in the absence of useful hints, which, drawn from the experience of many, should be collated in a compact and serviceable form. While it must be admitted that experience came before books, yet we must likewise admit that much information can be gathered from the results of experiences undergone by others, and many hardships and mistakes avoided. These results are gathered from books containing the fruits of what others in the same field sought to accomplish, and succeeding, pointed out a beaten path for others. We select from "The Explorers', Miners' and Metallurgists' Companion," by J. S. Phillips, M. E. (which work has, under the private publication of the author, already reached its third edition), a portion of Chapter IV. upon the peculiar kinds of the primitive and secondary rocks, which concern miners, as being most congenial for rich veins; and what formations should be avoided. As illustrating what we have just said in relation to making available the experience of others, Mr. Phillips says that the extensive and profitable mines throughout the world have been found near the junctions of the various primitive and secondary strata, frequently in both. Other collateral causes must be also present to create the fissures and and supply them with the several elements, and their solvents and precipitants, or minerals will not be precipitated therein.

Granite *proper*, with the three ingredients of quartz, feldspar and *mica*, is the primitive rock of Cornwall and many other noted mining regions, but in this country syenite, composed of quartz, feldspar and *hornblende*, appears to take its primitive positions, and where the tilted and metamorphosed secondary rock are also suitable, a great many very good silver mines have been found. These are not the only primitive formations congenial for mineral. As even true syenite is comparatively rare, the experience of the author in mineral-bearing primitive mountains, where the "country" or "bedrock" formation has not been produced by subsequent volcanic invasion, is, that if the rock is largely composed of *feldspar*, it is quite immaterial whether mica or hornblende is present, even the quartz may be entirely absent; provided also the rock has been sufficiently crushed and disrupted into joints by lateral pressure, to produce the necessary metamorphism for such deposits.

Now, the question arises, what are the additional appearances, modifications and transformations to be sought in these strata? The answer is that there are five very valuable indications; the first and most important being *broken ground*, or partial disruption, disintegration and decomposition of the stratum, which show that sufficient force has been in action for the creation of veins and for the shattering of the surrounding bedrocks to admit the free percolation of mineral waters as well as greater freedom for the decomposition of those rocks which may contain their precipitants. The centers of extensive primitive ranges are naturally very compact and water-tight, for which reason veins and minerals are seldom found in such elevated and primitive positions.

A second characteristic of mineralized districts is where the reefs of various rocks interlace and distort the primitive, transition and secondary formations by curvatures, shifts and slides, particularly when they range at varying angles and give evidence of different ages of such disruptions.

In the third place it is an invariably favorable sign for gold, as it is sometimes for silver, when the upheaved talcose, micaceous and argillaceous clay slates are much folded and tilted, even to the vertical for long distances, from their originally horizontal position, and when the *very lowest foothills* and oceanward flats show the presence of the *oldest* fossils of *salt-water* shells.

For a fourth indication, a moderate amount of the stains from the oxide of iron, generally disseminated throughout the stratum and mixed with the sulphuret of iron in and near the vein, are excellent guarantees for the presence of nearly all of the metals and metallic minerals, many of which are never found away from its influence or out of its company.

The fifth and last indication is the most difficult to describe, although as much heeded by the miner as is the soil by the farmer. It consists in what the miners designate as "kindly ground," "sugary spar" and "rotten ripe," the reverse being "ugly, unkindly ground," "hungry country spar" and "dried-up ore." It is, as the author says, "a peculiarly, congenial and prolific stratum, and a corresponding generous, maternal nature of the quartz from the veins, as well as a fresh, pregnant ripeness of the minerals themselves, as if but just arrived at complete strength, ere they are again dispersed by nature's solvents."

In prospecting it is unadvisable to go far away from the junctions of the transition or secondary with the primitive rocks, or to penetrate the interior of the more igneous volcanic regions.

Porous volcanic bedrock should be avoided for deficiency of veins and paucity of minerals, the few exceptions of metal in such a formation only prove the rule. Modern carbonates of lime and magnesia and clay slates that enclose well-defined and comparatively recent shells seldom produce veins with sufficient minerals to pay for extraction; excepting, however, rare pockets of silver, and the ores of lead, iron, coals, etc.

Another and important point to be regarded is the avoidance of too close proximity to extensive deposits of mineral, the property of others, as the largest bunch has its limits; and sufficient space must remain for the accumulations of the metallic elements or precipitants before another considerable body of ore can be deposited. It is generally better to go a few hundred feet, and often miles away from, than to mine in close proximity thereto. The history of great discoveries has too frequently shown a debit balance from such districts by this very indiscreet practice.

The miner must always remember that deposits fail much oftener than they continue rich, and that very many blanks must be expected for one prize. It is well not to be over sanguine, but rather to seek for defects in the formation and poverty in the mineral deposit before becoming too certain about the value of any particular "find." It is true that there are no certain indications in some of the secrets of nature, but the rules that have been laid down may be considered as relatively true, and if carefully followed with good judgment, for which there can be no rule, a certain amount of satisfactory success will attend the effort.

Stability and Prosperity of Mining.

Any business that is not remunerative cannot long be sustained or kept in operation. Among all the industries of the United States gold and silver mining have become so well established upon the base of profitable investments, that their permanency is no longer a matter of doubt. This industry is now regarded as a desirable one to engage in, and is destined to develop more and more evidences of reliable stability and continuous profit. We find that new investments are being made in gold and silver properties, and what is a still more favorable indication for the future welfare and solidity of mining operations, these investors are exercising a judicious caution before embarking in any mining enterprise. Carefully considered and cautious investments cannot fail of success. Where some make mines profitable, others are sure to follow in their footsteps. There is one great advantage in the business of mining for gold and silver, and that is, no matter how productive the mines may be, there is always an unlimited demand for their product, and there is no need of apprehension that the market will be overstocked.

Mining investors are appreciating the fact that it requires both labor and capital to place a mine in a working condition. They also know that economy is necessary in conducting the business. They do not therefore enter into the business with the same degree of speculation that for so long a time rested as a blight and evil upon mining. They go into it with a determination to make it a success. Under such a system, as before stated, mining must become a permanent and stable industry. The extravagant outlays that have so frequently attended mining, and that have conduced so greatly to the failure of conducting it, will not, under the new system, be incurred. These absurd expenditures will no longer be indulged in, for the lessons taught by past experience are not so readily or speedily forgotten. The rigid economy that will supersede the hitherto extravagance, will lead to a profitable result. Then when the mine is sufficiently developed to show ore enough to pay for the building of the needed improvements, it will be only a question of time and skillful management as to when it shall yield a profit to its owners and return to them the capital invested in the enterprise. Under this regime, mining is rapidly assuming its true position among the industries of the age—that of a permanent calling, and one of undoubted profit. With such a reputation, it will no longer be regarded as an uncertain and chimerical adventure, which detracts from the commercial credit of those engaged in it, but it will redound to their financial status as being connected with the most lucrative and vital business known. The dawn of a better era in mining is evidently now the precursor of an unexampled condition of prosperity in mining. *

A GENERAL subscription will be taken among the Catholic temperance organizations of Great Britain for the relief of the distressed in Ireland.

The Influence of Water in Mineral Veins.

[Written for the PRESS by S. P. LEEDS.]

Any light, even if but feeble, that can be thrown upon the principles which govern the formation of mineral veins and the deposit of the metallic ores in them, will be interesting, and may be valuable. If these principles were more thoroughly understood, such knowledge would greatly assist the practical miner in his determination whether to prosecute or abandon a lode. It would prevent a loss of time, labor and capital, which too frequently occurs in mining explorations. It would advance mining interests by leading to the prosecution of only really good veins.

There must be fixed natural laws which prevail in the formation of veins, for they cannot be the result of fortuitous circumstances. The uniformity of their phenomena is too obvious to be the result of accident or chance. Whatever those laws or principles are, they are still in activity; the veins have not lost their vitality. The process of solution and deposition is still going on. We witness this on the walls of copper lodes, where the deposition of the salts of copper are continually forming. We have instances of it in old silver mines that have long been flooded with water, by the deposit of silver upon the wood-work and sides of the tunnels or shafts. It is evident in the deposit of crystals of iron pyrites in similar situations. Nature never wastes material. Time does not appear to enter as a necessity in her workings, in an economical sense. The growth of a crystal may occupy centuries. When it is constructed its constituents are chemically adjusted—balanced with precision, and not a needless atom is contained in its structure.

All veins give proof of the action of water. Even the dry ones show that their dryness has not always existed, but that they have been filled with water at some previous period. A mineral vein could not exist unless water had been contained within it at some time during its formation.

What is termed the water-level varies in different portions of the same lode. The tightness of the vein, its contraction or expansion, may influence the passage of the water through it; and the looseness or the solidity of the adjoining rock may flood it in some places and keep it back in others. When, however, the water-level is reached, as a general rule, the ores become more compact and their character becomes more permanent.

Perhaps the opinions of others may not be out of place here.

When a band of rock is found very dry, and of a close crystalline grain, it is unfavorable to produce mineral.—*E. Hopkins' "Geology and Magnetism," p. 95.*

I was informed by an intelligent proprietor of mines in Cornwall that these thin cross-courses invariably displace the veins, and hold up the water on one side of the vein; but it is most worthy of notice that a vein which is rich in ore on one side of the fluan will be poor on the other. Is this connected with the fluan holding up the water?—*"Bakewell's Geology."*

This abundance of water, although occasionally very troublesome, is one of the very safest signs of persistence in depths yet unattained. It is extremely desirable.—*O. M. Leiber, Geol. Rep. South Carolina for 1857.*

The entire surface of the globe, to the depth of one mile from the level of the ocean, contains upward of 60% of water. The active principles of minerals, vegetables and animals cannot exist without water.—*London Mining Journal.*

Any causes which keep up the supply of water in a vein must inure to its benefit, because they yield to the water a solution of metallic salts, which are deposited within the vein.

The miners both in Wales and Derbyshire, maintain that wherever there is a depression in the strata, and they dip on both sides toward the vein, in such situations the richest veins occur.—*"Bakewell's Geology," p. 357.*

In pursuing the inquiry, "What influence does water hold in mineral veins?" it will be examined in the varied phases of—1st, its property as a solvent; 2d, its mechanical action; 3d, its electro-magnetic bearing; and 4th, its chemical power.

The Property of Water as a Solvent.

The solvent property of water is established beyond cavil. To what extent it is capable of acting upon metals or their salts in its passage through the crevices or pores of the adjacent rocks or the vein is not so completely determined. Still it is of sufficient intensity to produce a marked action upon all metallic salts, and in many instances upon the metals themselves. Some of the springs that flow to the surface are so fully saturated with mineral matter as to commence a deposit of it as soon as their waters meet the atmosphere. These deposits are so abundant, especially in the vicinity of thermal springs, as to raise extensive mounds around them which in some cases extend over many acres of ground. Such springs are confirmatory of the solvent power of water. The analysis of the water of the Rhine by Pagenetecher showed it carried annually out of Switzerland a quantity of solid matter in solution alone equal to a cube of 866 feet side.

When veins that have long been kept dry by artificial means have been allowed to refill with water and remain so for many years, mineral depositions will be found to have formed upon the timbers. The presence of the water has renewed the activity of the natural forces acting within the vein, and its solvent properties have enabled it to carry in solution the metallic ingredients that it deposited. But more especially is this solvent power manifested when the water is impregnated with certain gases or with alkaline solutions. The oxides of the metals are most freely acted upon by sure solutions, and their deposit is sure to occur under favorable conditions. Native and vitreous silver was found coating the wooden supports of the Dreyweiher mine in Marienburgh, which had been under water 200 years, and was reopened in 1777. As the primitive rocks contain more or less potash, the source of this alkali is readily accounted for. The presence of soda or lime in solution is also frequent. Should these alkaline waters also contain a chemical combination of sulphur they would act still stronger upon the oxides of metals with which they would come in contact.

All substances become dissolved in the course of time in the ordinary temperature of subterranean liquids. Sulphats of baryta, a substance common in lead mines, has been termed insoluble, although found in such a state as to leave no doubt of its being deposited from solutions.—*Hopkins' Geol. and Magnetism, p. 89.*

Hot springs and aqueous vapor are able to act very powerfully upon hard rock, such, for instance, as marble.—*Bischof, on Heat of Globe, p. 26.*

Additional testimony of the solvent power of water might be accumulated from geological writers, and from the experience which practical men have gained while working in veins, still, enough has undoubtedly been given to establish the fact of its great solvent qualities.

CAMP AT FLAMING GORGE, GREEN RIVER, UTAH.

AN IGNORED INDUSTRY.—"Mining, by virtue of its results, is one of the very foremost industries in California, ranking alongside of agriculture, and as such is entitled to due consideration. The writers who ignore this fact fail to meet the wants of their supporters, and by no means advance the interests of the commonwealth. If necessary, let them devote a little less space to dwelling upon the mineral resources of Nevada, Arizona, Mexico, Colorado, and other outside sections, and tell something about that of which the inhabitants of California at present know so little—the mines of their own State." Thus speaks the Nevada City *Daily Transcript.* It complains that the operations of the gold hunters are hardly noticed, except at the expense of a dozen words or so. We think that more attention might be devoted to the mining interest of this State by our local exchanges. There is hardly a newspaper in the States and Territories above mentioned that does not contain a great amount of local mining news. The facts are kept before the public intentionally. But we cannot say the same of all of the newspapers of this State. There is such a paucity of mining news that San Francisco papers are compelled to be brief. When the gold hunters' operations become as important to local journals as the war in Africa, for instance, or politics, there will be more mining news in the city papers.

DURING the progress of the Grant party through Iowa, the train at one point made 45 miles in 40 minutes.

Rolling Stones.

Habit has much to do with the roving disposition of our hardy prospectors, and if in the great hereafter, those who have benefited mankind to their own disadvantage, are to receive any reward, the gold hunters of our great West deserve one in the shape of a special corner, where they can sit, and smoke, and spin yarns about the rich finds they unearthed and the millionaires they have made. It is undoubtedly the fate of all men to succeed best in that for which they have a particular calling, and failure most always attends attempts to vary it. It is the luck of the prospector to succeed admirably in making grand discoveries, but it is his fate to run away to some new field, leaving the old one to those whose calling is to stick. It is said that hundreds of prospectors, with pick and shovel, are now making their way to the new mines of the Sierra Mojada, in Mexico, where they will encounter new hardships and expose themselves to every danger. "This," says the Grass Valley *Union,* "seems like an unwise thing to do, and yet just such men as the old California prospectors are the ones who made our State and the neighboring State of Nevada what they are to-day. We owe the discovery of most of our mines and also the great Comstock lode to them. They very seldom reap the reward of their findings, but they are still ready to pack up their few tools and go in search of new wealth, only to be enjoyed by some one else. It does not matter, as a general thing, how well they are doing in the place where they are already located, or how lively the camp may be. All they want is to go to some new country—they are sure they can do better by so doing. It seems a sort of mania with them, to go to some new mining camp, and are always ready and willing to take the chances of an uncertainty for a certainty—ready to give up a good, paying claim or a good job of work in the hope of striking it rich or getting better wages."

Flaming Gorge, Green River.

A Government party several years ago explored the canyons of the Colorado of the West. They first proceeded down the Green river, which enters the Uintah range by a flaring, brilliant-red gorge, visible from the north at a distance of 20 miles. The great mass of mountain ridge through which the gorge is cut is composed of bright vermilion rocks; but they are surmounted by broad bands of mottled buff and gray, which come down with a gentle curve to the water's edge on the nearer slope of the mountain. This is the head of the first canyon of a series made by the river through this range. The cliffs are about 1,200 feet high. Major Powell named it Flaming Gorge. Our engraving illustrates the picturesqueness of the scenery in that neighborhood.

THE bale of cotton donated for the benefit of the orphans of Gen. Hood was sold and resold several times at Houston, realizing $1,000. Then it was shipped to Waco.

THE latest news from New Mexico is to the effect that the command of Major Morrow is pursuing Victoria and his warriors into Mexico.

AN old mining town, hitherto unknown to the whites, has been discovered in Arizona.

New Zealand Gold Fields.

Late advices per *Thames Advertiser* mention an accident to the Big pump, caused by the wearing away of the packing. The pump is 70 feet under water, and the only way to get at it was to send a diver down the shaft, but after four days' trial gave up the job. Upon the operations of this pump depend the workings of several mines, which will have to be given up for the present, and until a proposed "lift" pump is put down to clear the water as far as the 400 level, which if successful will leave the plunger chest dry and enable the pump to be repaired.

The new mining road along the base of Una hill and up the Papa gully, is nearly finished. It will enable many claims to be worked which are now at a standstill, there being no means of bringing ore to the crushing mills on the flat.

In the Golden Calf some good gold has been come on, a leader four inches thick having been intersected on the Moanatairi side of the slide, in a portion of the property hardly ever worked before. The quartz shows strong colors of the precious metal, and a small parcel of the stone has been broken out. The Alhurnia seems to make the best showing, however, the reef (ledge) on the 70 level west being about three feet thick and heavily charged with mineral. Mr. Radford expects, in driving this level, to come under the run of gold now being worked at the Wbau level stopes, and he has been getting good gold lately. Seventy level, east: The lode is about three feet through, and shows a little gold. The leader lately cut in this drive is now being driven on, and shows gold, some rich specimens coming to hand occasionally. Stopes, 70 level: These stopes continue to give a good supply of crushing dirt, and show strong colors of gold. Whau level: Stopes are giving good payable crushing stuff, with a few pounds of specimens and picked stone. Battery: 213 tons of quartz have been crushed during the month for the return of 363 ozs. 6 dwts. of gold. The prospects of the mine appear much improved, and the manager is of opinion that when the 160 feet of Dixon's low level has been extended under where he has been driving in the 70 level, that rich stone will be discovered.

A RAILROAD TO BODIE.—From appearance we expect to be able in a short time to congratulate Bodie upon the possession of a railroad. The Virginia *Enterprise* of recent date says: Mr. D. O. Mille, who is at present in New York, has negotiated for the material necessary to extend the Virginia and Truckee railroad from the Mound House, via Mason valley, toward Bodie 60 miles, and the order has been, or will be in a day or two, given for the ties. So soon as the material can be landed here, active work on the construction will be commenced. We have often referred to the advantage which this railroad extension will work. It will awaken active life in five or six mining districts which are now well nigh dead; it will enable heavy machinery and building material to be carried to Aurora and Bodie at a reasonable cost, and it will also place 200,000 acres of first-class land in Mason valley convenient to market. This alone will furnish 1,000 families with comfortable homes on the best continuous body of land in this State. It will place Belleville, Candelaria, Marietta, New Boston, Columbus, Benton, and Indian districts within one day's drive of the railroad; it will bring Lake district, Belmont and Alida valley nearer Virginia City than Aurora now is. It ought, by the time it is finished, to give active work to 4,000 more miners than are now employed, and the farming population of the State ought to be increased by at least 800 families. With its completion the taxable property of Esmeralda and Lyon counties ought to double.

A LOVELY MINING REGION.—Judging from a letter to the Galveston *News* the Mojada mines of Mexico are pleasanter to stay away from than to settle in. The writer intimates that if all the reports of richness are true, yes, even if the whole range of mountains were composed of pure silver, it would be no inducement to go to a place where the nearest saloon or bakery is 125 miles distant. Besides all who go there must expect to leave their wives widows. When an American arrives at the Sierra Mojadas the Indians and Mexicans administer upon his estate without the preliminary inquest held in other countries upon the *corpus* of a rash adventurer. Then, too, if death is escaped, and the American has begun to dig out the ore, he will have to pay the Government 25 cents on the dollar to start on. The coinage, porterage, and finally stealage, will bring the cost on the dollar up to about 115 cents. The returned Texan appears to be prejudiced against this new mining region, and argues that the United States will not protect American citizens who are endeavoring to civilize Mexico by squatting upon her silver mines.

MINISTER KASSON will soon go to Bucharest to formally recognize the independence of Roumania and establish diplomatic relations between that country and the United States.

CAPTAIN CAREY, who was with the Prince Imperial at the time of his death, is to retire from his regiment and enter the church.

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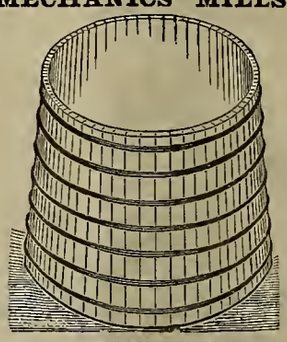

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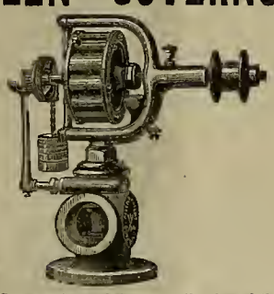

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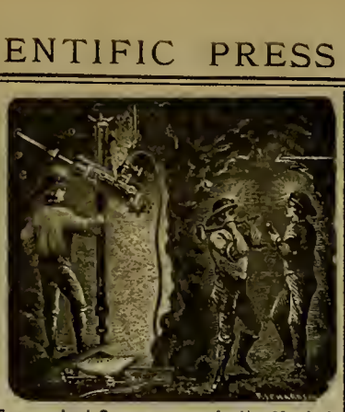

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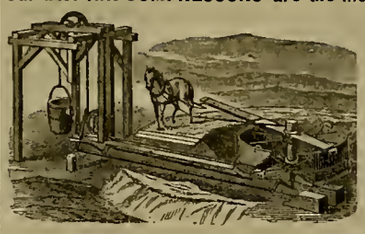

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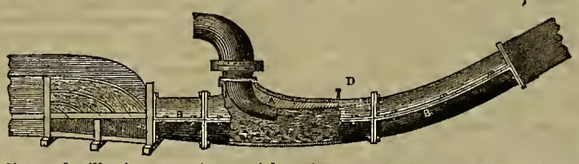

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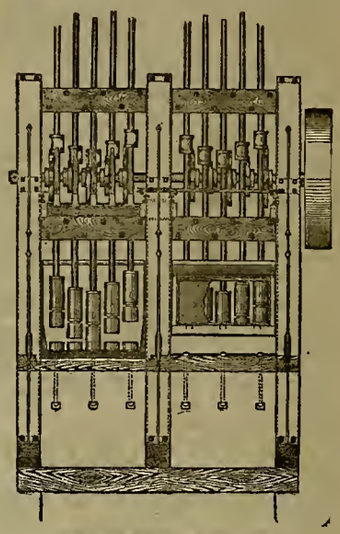

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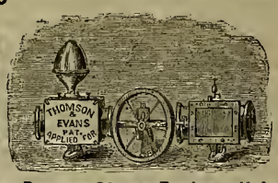

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CONTINUED FROM PAGE 293.

up and getting larger as we drive north on the vein. We have drifted north on this ore commencing at No. 3 raise, a distance of 70 ft in length, and I believe now it will prove to be part of the Transylvania ore body.

THE RIBO MINE.—This mine has been bonded to some San Francisco parties, who intend to work and develop it in a systematic manner. Parties who have examined the mine believe it to be a valuable property. Certainly the ore is not high grade, but then there is so much of it and it can be so easily extracted that it is sure to pay any company well that takes hold of it. At a depth of 30 ft the ledge is 9 ft wide, and it keeps increasing in width as greater depth is attained. The striking of more water than he could handle was what compelled Mr. Ribo to quit work in it. Some men are now at work in the mine putting things in shape for an early start.

EUREKA DISTRICT.

CALIFORNIA.—*Sentinel:* For some days past ore assaying from $50 to $70 per ton has been taken from the California mine, which adjoins the Connelly on the south. Its proprietors, Joe Mendes and Alex. McKenzie, have just refused $20,000 for the mine, and say they have half that amount in ore now in sight.

MOUNT ROSE DISTRICT.

BULLION.—A writer in the Paradise *Reporter*, of November 1st, speaking of this mine, says: I never saw before such vast quantities of rich ore as was there to be seen. The ledge is six to eight ft wide, and rich in the precious metals from hanging wall to footwall, not a barren spot to be seen. The ledge runs north and south, with a half inch of clay gouge between the ore body and walls. This company are running their five-stamp mill day and night.

MARY WILDER.—The same writer says: Two men, a few days ago, found this new quartz ledge, six miles west of Paradise village, in the Paradise range. It is situated on a ridge making down from this granite mountain, and at the head of what is known as Chote canyon on the north, and Singhas on the south. Course of ledge so far as I was able to judge by the course of the ridge and general trend of the country rock is south southeast by north northwest, the country rock being granite syenite, with small gouge of porphyry lining to ledge, which is four ft wide, one foot of ore assaying from $236.62 to $2,200 per ton. Character of minerals, copper, silver, glance, black metal, with occasional spots of ruby. I was told that native silver also had been detected in fine particles in some of the ore.

NORTHUMBERLAND DISTRICT.

BLUE EAGLE.—Belmont *Courier:* From Mr. Stonebarger we learn that the work of development is progressing satisfactorily in the Blue Bell and Blue Eagle mines, and that ore is being extracted at a rapid rate. There is a large quantity of good milling ore in sight in both mines, and hauling to the mill was begun last week. The mill will start up about the 1st of November, and Mr. Stonebarger feels confident of making a long and profitable run.

PIOCHE DISTRICT.

ITEMS.—*Record*, Nov. 1: Last Monday the Newark mine was again started up, this time under the auspices of Ryan & Co., who have leased it for a term of months for the purpose of obtaining screenings for leaching. The American Flag mine has been leased for two years by responsible parties, who will soon start to work on it. The American Flag has a large deposit of smelting ore. Some miners are working on the Amador tunnel property. They recently extracted 30 tons of screenings, which were leached, yielding $43 per ton, leaving $8 per ton in the tailings that were run off.

RAYMOND & ELY.—Supt. Mill, in his last report, dated October 31st, says: The stopes on the 1100 level look very well and promising; the winze is now down about 55 ft and good ore is coming in and prospects there looking very flattering. We are running drifts east and west on the winze; the west drift looks very well and the ore is three ft wide. Have now 300 tons of ore at the mill, which will start up again on or about the 3d prox.

ARIZONA.

GLOBE DISTRICT.—*Silver Belt:* The bolstlug works of the McCormick M. Co. have arrived on the ground and are to be speedily put into motion, when a large force will be put on the mine. Work will be recommenced on the Hannibal mine at McMillen after the 1st prox. under the superintendence of Chas McMillen. Ed Cummings, Secretary of the company, will return to take charge of the books. The strike on the Antler mine at McMillen promises to be a big one. The stratum of native silver, several inches in width, resembles the one that made the Stonewall Jackson, of which the Antler is a second extension south, so famous and from which hundreds of thousands of dollars were taken. Buck & Hayes' mine on Salt river prospects well. An average of 12 assays gave a result of over 500 oz. per ton in silver. Frequent assays for gold from this mine have given astonishing results, going high into the thousands. A working test is to be made soon in the Isabella mill.

TOMBSTONE.—The *Weekly Nugget*, of October 30th, says: John Haley, the owner of the Anchor mine, has made an open cut into the ledge about 10 ft deep, and from the footwall the bottom and sides are in ore, from which assays have been made going all the way from $156 to $2,000. It is a beautiful carbonate, and the ledge is easily traceable 8 ft in width along the claim for a long distance and keeping its width as the shaft descends. The formation is limestone, with a hanging wall of porphyry, capped in lime.

SILVER KING MINE.—The Arizona *Silver Belt*, of Globe, Arizona, in its issue of November 1st, speaking of the late strike in this mine, says a 60-foot crosscut at the depth of 250 ft, in the new shaft, reveals a body of high-grade ore of almost incalculable extent. The crosscut is in solid ore from the beginning, and as yet the opposite wall has not been reached. Shaft No. 1, 400 ft east of the working or new shaft, has attained a depth of 300 ft, where the vein shows an uninterrupted body of ore, 85 ft from wall to wall. The vein is unbroken from top to bottom of this shaft.

COLORADO.

SAN JUAN.—The *Prospector*, published at San Juan, Del Norte county, says: Carbonates have been discovered about 6 miles north of town. A reporter visited the new camp and found the entire country staked and work being done on several locations. While this is, in reality, a new discovery so far as silver and carbonates are concerned, it is not new in the matter of gold quartz, having been worked to some extent in the summer of 1876, but at that time nothing but gold was thought of, and, like Leadville, carbonates were unknown to the average prospector. Attention was first attracted to this new discovery by Wm. Bingham, who forwarded some of the ore to Morgan E. Draper, at Lake City, for analysis. The returns from four assays showed that the rock carried about 7 or 8 oz. of silver to the ton and a small percentage of gold. Then began the real excitement, and since that time numerous locations have been made in the vicinity.

COLORADO CENTRAL MINE.—Georgetown *Courier*, Oct. 30: The product of this mine is said to be larger than any other mine in the State with the exception of two or three carbonate mines at Leadville. The numerous workings running in every direction expose rich veins of quartz and ore from 3 to 20 inches in thickness, and assaying all the way up to 890 oz. per ton, some of the ore veins being solid, that on the 330 level, which Dalton & Co. are working, carrying large quantities of gray copper.

TROPIC MINE.—The new shaft on the Tropic lode has now reached a depth of 115 ft, and at the bottom the ore vein is 18 inches thick and solid. This shaft shows ore near the whole distance, the vein ranging from 6 to 13 inches in thickness. In the main workings the 100 level is being pushed both east and west, and in both directions it continues in good ore. The ore mills about 125 ozs. in silver, ½ oz. in gold, and from 2% to 7% copper.

IDAHO.

SNAKE RIVER.—The *Enterprise* says: We are informed that the Secretary of the Idaho Snake River G. M. Co. has arrived at Eagle Rock, the headquarters of the company, and that work will be commenced on the mines at once. The company owns the Black Canyon mines, comprising 80 acres of mining lands, and said by many to be the richest claims on Snake river. The contracts for the ditching have been signed, and the mining machinery is being made East and in Ogden. The company has a process for working the mines and saving the gold, superior to any that has yet been placed on the river. We have reliable information that one man has been quietly at work on the river with perfected machinery of his own, getting out $400 per day.

YANKEE FORK.—The St. Helena *Independent* says: The Montana mine, in the Yankee Fork country, was found in a real glacier. Sixty feet of the surface croppings had been broken off and carried some 30 or 40 ft down the mountain. The owners, knowing the glacier never moves up hill, followed upward through the ice and frozen ground until they reached the point where the lode was broken off, finding it as large and quite as rich as below. The company's ore house, dump, etc., are all on the glacier, but its movements are not perceptible, if indeed it is moving at all.

MONTANA.

BONANZA CHIEF.—Helena *Independent:* This prospect is now attracting much attention, both on account of its unusual richness and its peculiar formation. For a distance of about 66 ft in the direction of what was supposed to be the trend of the lode, and about the same distance transversely, search has been made for the walls of the mine, but the effort has only served to uncover the largest deposit of ore yet found in this region. Jasper, malachite agate and iron are mixed and mingled in a confused mass, and through all is found good pay of the "yellow dust." At a depth of 26 ft there is no apparent change in the character of the deposit. It is estimated by competent observers that there are 800 tons of ore now on the dump, and, in a miner's phrase, there is three times that amount in sight. We understand that the present mill is to be enlarged to 20 stamps, and complete pumps and hoisting works put up by Eastern parties.

CATARACT MINE.—Butte *Miner*, Oct. 23: Col. Black's "Mantle" lode is not so fabulously rich as at first supposed. There is a 4-inch vein of rich rock which assays very high, and this vein has been traced for about 300 ft. The entire vein averages 3 ft, but the value of the ore throughout has not been ascertained. Riley owns the Independence lode, on which he has sunk a 30-ft shaft. This mine looks well, and is probably as promising as any lode in the camp. There are great numbers of lodes in the vicinity, some of them assaying quite high in silver.

RICH STRIKE IN BELCHER.—The Belcher M. Co. for some time have been engaged in running a crosscut tunnel through the Rainbow vein to strike the Belcher lode, a continuation of the Alice, owned by Walker Bros. At a point about 180 ft from the tunnel mouth they cut through the hanging wall and exposed about 2 ft of ore assaying from 106 to 372 ozs. in silver, and carrying from $40 to $50 in gold to the ton. Pushing the tunnel ahead and across the vein they passed through 16 ft of mixed ore and gangue, showing silver and gold by assay, but not enough of either metal to warrant the saving of it for pay. Beyond this another streak of ore was cut 15 inches in thickness, showing better than the former one, but no assays have as yet been made of this new find. The tunnel is being driven steadily ahead by contract, and is still in vein matter. It is the intention of the company to drive the tunnel completely through or across their ground, which will give a total length of about 600 ft, and it is known that at least two other veins will be cut by it. The lead already cut has all the characteristics of the vein shown in the Alice workings, and it is evidently the same ledge.

NEW MEXICO.

GRANT COUNTY.—The *Herald*, published at Silver City, says: We understand that Thomas Lyon's mine, situated about half way between here and Lons Mountain, is opening up in splendid style. The specimens brought in assay from $300 to $600 in silver, and the ore is increasing in quantity as well as improving in quality as work progresses.

OREGON.

MAMMOTH MINE.—*Bedrock Democrat*, Oct. 29: Another link of wealth added to the mineral resources of eastern Oregon—the Mammoth quartz ledge, discovered in 1867, on the mountain, eight miles from Sumpter, but for the want of experience in mining and the lack of energy, it remained undeveloped until last spring, when a company of miners purchased the property and opened up the mine, taking out several hundred tons of very rich ore. Becoming satisfied of their purchase, a five-stamp steam mill was bought and erected, it being completed last week. The stamps were put in motion, and after a few days' run the sum of $400 was realized, and forwarded to this city. Several specimens of rich ore from this mine are on exhibition at the bank of J. W. Virtue, Esq.

NEW PLACER DIGGINGS.—An exchange says: J. G. Henrica, of Portland, has found gold placer diggings on Wildcat creek, on the north fork of the John Dels river. He and his partner found gold in paying quantities, and the "gold fever" has already struck a number of people in that locality.

Arizona's Railroad Prospects.

Considerable that is flattering to Arizona was uttered by Judge Underhill of the S. P. R. R. in an interview with Major Hall, published lately in the Washington *Republican*. Judge Underhill says, however, he does not think it equal to Nevada or Colorado in either its mining wealth or agricultural resources. As far as mining developments have been made, it would seem the richer portions of the Territory are adjacent to the line of the Southern Pacific railroad, as built and proposed; also that section lying between the railroad and Prescott, to which latter point it is designed to construct a branch road at an early day. It has an excellent climate, however, and is a fine stock-grazing country. Many of the lands designated as "desert" will bear the best of crops with water on them, and many of them can be irrigated by the rivers, and a large portion probably by the sinking of artesian wells.

The Judge's private opinion is that a railroad will not very soon be built with Guaymas or any port on the Gulf of California as a terminus. Upon this subject he says: I have heard it suggested that the China and East India business would seek a port on the Gulf of California, and thence take its way East by rail, but any one that understands the winds, currents and distances of the Pacific will know that can never be done, as all sailors from those countries come down on the trade winds, and would pass near San Francisco, which is about 1,600 miles from Guaymas, and the last half of the distance in light, variable winds which sailors so dread—and steamers certainly would never think of going there when they could stop at the port of San Pedro, on the Southern Pacific railroad, nearly 1,000 miles less steaming than to go to Guaymas, and then be very little, if any, nearer the junction of the two roads.

Recent Decisions Relating to Patents, Etc.

U. S. Circuit Court, Southern District of New York.

Webster Loom Company vs. Higgins et al.

Decided January 14th, 1879:

1. Patents are to be construed in the light of what was before known to persons skilled in the art to which they relate in order to give effect to the true meaning of what is there described.

2. The description in a patent must be so full and plain that a fairly competent workman in the art could take it, and, exercising the then existing knowledge of the trade, follow it out, and by it, without addition or invention, construct an operative machine containing the parts mentioned in combination.

3. If it requires experiment and invention to make and use the matter described, the patent is invalid.

4. The several parts of a machine or device may combine in producing a result and yet not constitute a patentable combination, but only a mere aggregation.

5. In the absence of other evidence, the date of the patent is to be taken as the date of the invention, and the burden of proof is upon the defendant to show, beyond any fair doubt, prior knowledge and use. When such evidence has been produced, the burden is shifted upon the plaintiff to show still earlier invention.

The following decisions are by the Commissioner of Patents.

Anvils—Ex-parte Ducsh.

Decided June 18th, 1879.

The combination of a drill, adjustable standard, and vise with an anvil, as such, is not a legitimate mechanical combination, for the anvil, as such, can make no contribution to any distinct operation of the entire machine. But the combination of a drill, adjustable standard and vise, by means of a base to which the standard and vise are attached is a legitimate combination embracing no supernumerary elements, and, if novel, is patentable.

Time-Locks—Ex-parte Kook & Hall.

Decided July 8th, 1879.

When different forms referable to one genus are such that the substitution of one for another involves invention, the differences are patentable, and the several forms constitute different species of the genus, all subject to one generic patent, but each legally patentable in a distinct and specific patent. When, however, the substitution of one for the other involves no invention, but only mechanical skill, the differences are not patentable and the forms do not constitute several species of the genus, but are all modifications of the same species.

NEW MINING MAP.—We acknowledge with pleasure the receipt of a handsome map of the Lake mining district of Mono county, California, as surveyed and published by Wm. S. Lilien, U. S. Deputy Surveyor, and approved by the representatives of the mines of the district as correct. The map is tastefully arranged, with the claims colored and clearly distinct. The district appears on the map lying east of the headwaters of the south fork of Owens river, and snugly within a bend of the same, which widens into seven quite large lakes, which form an excellent water supply. Mammoth and Pine City also appear on the map as centers of their respective claims. We fancy the map as also the location of the district.

SOUTHERN CALIFORNIA.—This is the title of a pamphlet just published by C. H. Phillips, of San Luis Obispo, and designed for circulation among immigrants and colonists seeking homes on this coast, with a view to aid in the settlement of southern California, and particularly San Luis Obispo county and vicinity. Arrangements have been made for the free distribution of several thousand copies at Omaha and other Eastern points. The expense of this edition of 10,000 copies, together with the cost of the 20,000 maps, has been more than the small subscription in aid of the work will meet, consequently, a few thousand extra copies are for sale, and will be mailed to any address in the United States, postage paid, at 25 cents each.

Thanksgiving.

Proclamation.

At no recurrence of the season, which the devout habits of religious people has made the occasion for giving thanks to Almighty God, and humbly invoking his continued favor, has the material prosperity enjoyed by our whole country been more conspicuous, more manifold or more universal. During the past year also unbroken peace with all foreign nations, general prevalence of domestic tranquility, the supremacy and security of the great institutions of civil and religious freedom have gladdened the hearts of our people, and confirmed their attachment to their Government, which the wisdom and courage of our ancestors so fitly framed, and the wisdom and courage of their descendants have so firmly maintained, to be the habitation of liberty and justice to successive generations.

Now, therefore, I, Rutherford B. Hayes, President of the United States, do appoint Thursday, the 27th day of November, instant, as a day of national thanksgiving and prayer; and I earnestly recommend that, withdrawing themselves from secular cares and labors, the people of the United States do meet together on that day in their respective places of worship, there to give thanks and praise to Almighty God for his mercies, and devoutly to beseech their continuance.

In witness whereof, I have set my hand and caused the Great Seal of the United States to be affixed.

RUTHERFORD B. HAYES.

New View of the Debris Question.

A new idea has lately been suggested by an exchange in regard to the debris troubles, which if it does not compensate for any damage alleged to have been done in the past by the accumulation of waste material upon fertile soil, may at least throw a ray of light upon the chaos of opinions foisted upon the public as remedies against the complained of evil. It is an open question whether the courts can settle the disputes between the hydraulic miners and farmers to the full satisfaction of both parties, and it must be evident that in any event mining will not be stopped, nor will our agricultural lands be destroyed. Even if hydraulic mining should be interdicted, it would not afford a remedy for the damage already said to be inflicted upon agricultural lands. Our exchange puts it in the following light:

The rivers are already full of debris, and every creek, brook and gulch that feeds them. Should mining all cease now, it would require half a century—probably half a dozen centuries—to clean them out and restore their beds to their condition in 1852.

What, then, shall be done? What can be done? We cannot dig the debris out. That would be more than a herculean undertaking. It is there to stay at least until the child born yesterday shall reach old age. It is idle to expect any substantial assistance either from the State or the nation. There is nothing in our system of government that is paternal. It allows the widest range for people to take care of themselves, but it never bothers itself to take care of them. If a state or a county gets into trouble, it kindly lets it get out the best way it can. If it will not vote subsidy to construct dykes for the protection of Louisiana or Mississippi, we may be sure it will not assist us to dam back the waters of the Yuba and American for the protection of the private land contiguous. If it should, then Louisiana and Mississippi would demand the like paternal favor. Neither will the State Legislature lend a hand. If it should attempt to, the taxpayers not directly interested would pierce the sky with howls of indignation against it, and they are greatly in the majority.

The question recurs, then, What shall, what can be done? The owners of the land and town property threatened will have to do it, whatever it may be. Nobody helped brave old Sacramento to raise her dykes and her grade. Nobody will help the farmers and land owners directly interested in this emergency. They will have to help themselves as the Hollanders did. And if they do it wisely and well they will be able, like the Hollanders, to turn a seeming calamity into a great blessing. If they will combine and dyke in their lands against the annual winter and spring overflows, as the Netherlands have been protected against the Schaldt and Meuse, with floodgates for irrigation, they will soon discover in the abundance of their harvests that it is better, far better, to have the rivers running nearly on a level with their farms than in their original deep channels. In this way some hundreds of thousands of acres of land hitherto believed to be of no account, may be converted into fertile fields, adding millions of bushels of grain to the yearly production of the State, and that with positive certainty. The season of high water is the season when irrigation or the flooding of the grain crop is needed, that is to say, from January to May. No irrigation is required for grain after the middle of May, when the rivers begin to recede rapidly. If Bear river were properly dyked and provided with facilities for flooding the land during the winter and spring months its valley would become a paradise of fertility instead of the desert it now is.

Of course the question of money damages for the injury already claimed to be done is not contemplated here, upon the principle, we imagine, that the raising of the river beds is a compensation therefor, inasmuch as it affords better irrigation facilities. We give this view of the debris question for what it is worth, and without expressing an opinion as to its merits.

EXPLORERS', MINERS' AND METALLURGISTS' COMPANION.—J. S. Phillips, M. E., has just completed the publication of the first volume of the third edition of the above work, in library and pocket size. The work is as complete as any work of the kind can be, and is in another shape that it may be conveniently carried in the pocket by the prospector. The first volume, now ready, is complete in itself as an explorer's and assayer's companion. The volume is full of useful and important information in every branch of the mining business, and that it is favorably regarded appears from the fact that a third edition was called for. This has been issued, and contains much new matter. Mr. Phillips is his own publisher, as he has been from the start, and is deserving of commendation for his energy in successfully solving the problem of author and publisher.

IN New York, Government bonds are quoted at 102¾, for 4s of 1907; 102¼ for 5s of 1881; 106¼ for 4½s; sterling, $4.81½@$4.83½; silver bars, 116; silver coin, ⅜@⅞ discount.

News in Brief.

ELECTIONS in eight States last Tuesday.

EX-EMPRESS EUGENIE has returned to Chiselhurst.

POTATOES retail at four cents per pound at Eureka.

BISMARCK is suffering from neuralgia and sleeplessness.

CARLOTTA, ex-Empress of Mexico, is recovering her reason.

SPAIN is to dispatch additional reinforcements to Cuba immediately.

A SEVERE gale was experienced on the Atlantic coast last Monday.

JACOB ABBOTT, the author, died at Farmington, Me., aged 76 years.

GENERAL SALOMON has been proclaimed President of the Republic of Hayti.

THURSDAY, the 27th, is named by the President as a day of thanksgiving.

AN epidemic typhoid fever and measles prevails at Cape Clear, Ireland.

A RAILROAD is to be built between Santa Barbara and Newhall, 80 miles.

THE Pennsylvania Railroad Company has declared a semi-annual dividend of 2½%.

IT is rumored in London that Russia is preparing to declare war against England.

HEAVY rains have fallen in the Argentine Republic, dispelling all fears of a drouth.

THE death of John Baldwin Buckstone, the famous English comedian, is announced.

SIXTY-SEVEN persons have perished from bush fires in the province of Minas-Geraes, Brazil.

THE French Government will not allow Methodist ministers to preach to the soldiers.

THE Spanish Council of Ministers has decided to abolish the state of siege in the Basque provinces.

THE storm in Nova Scotia last week damaged Prince Edward's Island to the extent of $60,000.

SILVER in London, 53½d; consols, 97 13-16; 5% United States bonds, 105½; 4s, 105⅛; 4½s, 109½.

ALL Spanish officers are to contribute one day's pay to the relief of the sufferers by floods in Murcia.

THE report of the suspension of the Russian expedition against the Tekke Turcomans is confirmed.

THE death of Charles Gruneison, the noted theologian and biographer, is announced from London.

LACK of money in the San Francisco school fund compels teachers to discount their pay warrants.

THE total value of the pieces coined at the United States Mint during October is given at $6,198,254.

THE thermometer at Memphis, Saturday, fell to 37°, sweeping away all lingering germs of yellow fever.

SEVERAL persons have been drowned and 26 houses destroyed by floods in the province of Huascar, Spain.

AT Liverpool, wheat is quoted at 10s 9d to 11s 9d for average California white, and 11s 7d to 12s for club.

THE difficulty regarding the shipment of the Egyptian obelisk to New York has been amicably arranged.

OFFICIAL returns show that 3,065 French Communists have been amnestied, about 1,000 remaining excluded.

THE Prussian budget shows the deficit for the next fiscal year to be $11,901,810, which will be covered by a loan.

A DISEASE called the "black tongue" has caused the death of several persons at London, Ont., and vicinity.

FURTHER sales and floods have occurred in Spain, doing great damage to property and drowning 60 persons.

THE Liberals were mostly triumphant in the English municipal elections, wherever political considerations were involved.

IN San Francisco, half dollars are quoted at par; trade dollars, 95 buying, 96½ selling; Mexican dollars, 96 buying, 96½ selling.

THERE is a well authenticated report on the Comstock that the north header of the Sutro tunnel is encountering streaks of ore.

THE wells used by a German colony in Bessarabia were recently poisoned, making 100 persons ill and causing the death of five.

THE annual Christian co-operation of the State of Oregon, is to begin at the Christian church in Independence, Polk county, on Tuesday.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Hillside, Nov. 1st, $5,000; Northern Belle, Oct. 29th, $5,953.10; Con. Virginia, Oct. 29th, $103,760.78; Belle Isle, Nov. 3d, $25,000; Ophir, Oct. 26th, $75,837.36; Christy, Nov. 4th, $7,762; Leopard, Nov. 3d, $3,500; Alexander, Oct. 31st, $6,663.40; Northern Belle, Nov. 1st, $7,685.96: Hillside, Nov. 4th, $4,500; Gila, Nov. 5th, $6,847; Alexander, Nov. 3d, $5,255.75.

A NEW PAPER.—We welcome the Monitor *Argus*, a new paper published by P. W. Parker, at Monitor, Alpine county, California. It is quite young, and we must say it, *small* for its age, but, for all that, contains much more mining news than some of its older and bigger contemporaries.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING OCTOBER 28TH, 1879.

221,011.—STEAM GENERATOR—D. Abell, Carson, Nev.

220,965.—HINGE FOR DOUBLE DOORS—J. Decombe, S. F.

220,978.—AMALGAMATOR—A. F. Ladd, S. F.

220,923.—CAR TRUCK—E. J. Marsters, Stockton, Cal.

221,045.—FIRE ESCAPE—P. Gallagher, Eureka, Nev.

221,081.—WINDMILL—R. Lorenzo, Loyalton, Cal.

220,940.—VENTILATING MINES—W. B. Norman and R. H. Leonard, S. F.

2,104.—Title, "STRASSMAN'S BLOOD RENOVATOR. The best alterative and depurative ever discovered"—Label—Max Strassman, S. F.

2,105.—Title, "STRASSMAN'S RADICAL RESTORATIVE"—Label—Max Strassman, S. F.

2,106.—Title, "STRASSMAN'S REPARATIVE BALSAM"—Label—Max Strassman, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

IMPROVEMENT IN APPARATUS FOR MAKING AND LAYING CONTINUOUS CONCRETE PIPE.—Ezra M. Hamilton and Charles N. Earl, Los Angeles, Cal. Patent No. 220,757, dated Oct. 21st, 1879. This invention relates to an improved method and apparatus for the manufacture of concrete or cement pipe, and it consists of a cylinder or case, which is laid horizontally in the trench prepared for the pipe, said cylinder being provided with a piston or plunger, which is operated by hand, and which forms the pipe from the mortar or cement, which is fed to the cylinder from a feed tube or hopper on top. A flexible core is attached to the end of the piston, which forms the orifice through the pipe, the pipe being thus made in a continuous piece, without joints of any kind, so that any leakage is avoided.

WRENCH.—Andrew Jackeon, 143 Fremont street, San Francisco. No. 220,076, dated Sept. 30th, 1879. This device relates to an improved universal wrench, and it consists of a novel combination, with other devices, of a stationary and a movable jaw, the moving ends of which are separated or closed in a line diagonal to the handle by means of a screw which actuates a movable nut. The movable jaw is hinged to this nut so as to open or close at will, and is kept closed by a spring. The invention also consists in certain details of construction, whereby any form of nut or pipe may be seized and turned. The tool is simple, easily and rapidly fitted to any nut, bolt or pipe, and has few parts to become broken or get out of order.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Oruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

HOW TO STOP THIS PAPER.—It is not a herculean task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

EXTRA COPIES can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

Chew JACKSON'S BEST Sweet Navy Tobacco

METALS.

[WHOLESALE.
WEDNESDAY M., November 5, 1879.

IRON.—	
American Pig, soft, ton	28 00 @35 00
Scotch Pig, ton	26 00 @30 00
American White Pig, ton	25 00 @— —
Oregon Pig, ton	28 00 @35 00
Refined Bar	4 @ 8
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 8
Norway, according to thickness	7 @ 8
COPPER.—	
Sheathing, ℔	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, ℔	18 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	18 @ 19
Plow Steel	8 @ —
TIN PLATES.—	
10x14 I O Obarcoal	8¾@ 9
10x14 I C Coke	7 @ 7
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, ℔, less than cask	9½@— 10
NAILS.—	
Assorted sizes	3 50@4 50

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & CO.]

SAN FRANCISCO, November 5, 3 P. M.

SILVER, ¼.

GOLD BARS, 890@910. SILVER BARS, 10@18 ⅌ cent. discount.

EXCHANGE on New York, 20, on London bankers, 49½@49¾. Commercial, 50; Paris, five francs ⅌ dollar; Mexican dollars, 92.

LONDON CONSOLS, 97 13-16; Bonds (4%), 106¼.

QUICKSILVER in S. F., by the flask, ⅌ ℔, 45c.

GENERAL MERCHANDISE.

[WHOLESALE.]
WEDNESDAY M., November 5, 1879.

CANDLES.	
Crystal Wax	17 @17½
Eagle	12 @—
Patent Sperm	30@—
CANNED GOODS.	
Assorted Pie Fruits,	
2½ ℔ cans	2 25 @ —
Table do	3 50 @ —
Jams and Jellies	3 75 @ —
Pickles, hf gal	3 25 @ —
Sardines, qr box	1 67½@1 90
Hf Boxes	2 50 @2 75
Merry, Faull & Co.'s.	
Preserved Beef,	
2 ℔. doz	3 75 @4 00
do Beef, 4 ℔. doz	6 50 @ —
Preserved Mutton,	
2 ℔. doz	3 75 @ —
Beef Tongue	6 50 @ —
Preserved Ham,	
2 ℔. doz	6 50 @ —
Deviled Ham, 1 ℔. doz	5 50 @ —
do Ham, ½ ℔ doz	3 00 @ —
Boneless Pigs Feet,	
3 lbs	4 50 @ —
2 lbs	3 75 @ —
Spiced Fillets,	
2 lbs	4 25 @ —
Head Cheese,	
3 lbs	4 25 @ —
COAL, Jobbing.	
Australian, ton	6 50 @ 8 00
Coos Bay	— @ 5 75
Bellingham Bay	— @—
Seattle	6 00 @ 7 00
Cumberland	13 00 @14 00
Mt Diablo	4 75 @ 5 75
Lehigh	11 50 @12 50
Liverpool	6 00 @ 6 50
West Hartley	— @ 9 50
Scotch	— @ 9 50
Scranton	— @— —
Vancouver Id	7 50 @— —
Charcoal, sack	75 @— —
Coke, hush	60 @— —
COFFEE.	
Sandwich Id, ℔	— @— —
Costa Rica	18 @ 16¾
Guatemala	18 @ 16¾
Java	25 @— 26
Manila	17 @— —
Greund, in cs	25 @— —
FISH.	
Sao'to Dry Cod	2¾@—
do in cases	3½@—
Eastern Cod	— @—
Salmon, hhls	7 00 @ 7 50
Hf bbls	3 50 @ 4 00
1 ℔ cans	1 40 @ 1 50
Pkld Cod, bbls	— @— —
Hf bbls	— @— —
Mackeral, No. 1.	
Hf Bbls	9 50 @10 00
In Kits	3 00 @ 3 25
Ex Mess	3 50 @ 3 75
Pkld Herring, bx	3 00 @ 3 50
Boston Smkd H'g	50 @— —
LIME, Etc.	
Plaster, Golden Gate Mills	3 00 @ 3 25
Land Plaster, tn	10 00 @12 50
Lime, Sta Cruz, hhl	1 25 @ 1 50
Cement, Rosendale	2 00 @ 2 25
Portland	4 00 @ 4 50
NAILS.	
Assted sizes, keg	4 25 @ 4 75

OILS.	
Pacific Glue Co's	
Neatsfoot, No 1	1 00 @ 90
Castor, No 1	1 30 @ —
do, No. 2	1 20 @ —
Baker's A A	— @1 30
Olive, Plagniol	5 25 @6 75
Possel	4 75 @5 25
Palm, ℔	9 @ —
Linseed, Raw, bbl	85 @ —
Boiled	90 @ —
Cocoanut	60 @ —
China nut, cs	7½@ 73½
Sperm	1 40 @ —
Coast Whales	35 @ 45
Polar	— @ 45
Lard	80 @ 90
Oleophine	— @ —
Devoe's Brlt't	16 @ 17½
Photollte	— @ —
Nonpariel	— @ —
Eureka	19 @ 20
Barrel kerosene	20 @ —
Downer Ker	30 @ —
Elaine	34½@ —
PAINTS.	
Pure White Lead	8 @ 8½
Whiting	1½@ —
Putty	4 @ 5
Chalk	1½@ —
Paris White	2½@ —
Ochre	3½@ —
Venetian Red	3½@ —
Averill Mixed Paint, gal.	
White & tints	2 00 @2 40
Crsen, Blue & Ch Yellow	S 00 @3 50
Light Red	S 00 @3 50
Metallic Roof	1 30 @1 60
RICE.	
China, Mixed, ℔	4½@ —
Hawaiian	6½@ —
SALT.	
Cal. Bay, ton	17 00 @24 00
Common	10 00 @12 00
Carmen Id	12 00 @25 00
Liverpool fine	18 00 @— —
SOAP.	
Castile, ℔	8 @ 15
Common brands	4½@ 6
Fancy brands	7 @ 8
SPICES.	
Cloves, ℔	47½@ 50
Cassia	19 @ -
Nutmegs	97½@1 10
Pepper Crain	14 @ 15
Pimento	19 @ 20
Mustard, Cal., ½ ℔ glass	— @1 25
SUGAR, ETC.	
Cal. Cube, ℔	— @ 10½
Powdered	— @ 10½
Fine crushed	— @ 10½
Cranulated	— @ 10
Colden O	— @ 8½
Cal. Syrup, kgs	70 @ —
Hawaiian Mol'sses	26 @ 30
TEA.	
Young Hyson, Moyune, sto	— @ 51
Country pckd Gunpowder & Imperial	— @ 42½
Hyson	30 @ 85
Fooo-Chow O	35 @ —
Japan, 1st quality	40 @ —
2d quality	20 @ 2

LUMBER.

WEDNESDAY M., November 5, 1879.

CARGO PRICES OF REDWOOD.

Rough, M	12 00
Rustic	18 00
do, No. 2	14 00
Flooring	20 00
do, No. 2	13 00
Beaded Flooring	23 00
Refuse	13 00
Half-inch Siding	16 00
Refuse	14 00
Half-inch Surfaced	20 00
Refuse	14 00
Half-inch Battens	16 00
Pickets, Rough	11 00
Rough, Pointed	12 50
Fancy, Pointed	18 00
Shingles	1 75

REDWOOD.
RETAIL PRICE.

Rough, M	15 00
Picksts, Rough	15 00
Pointed	16 00
Fancy	22 50
Siding	20 50
Surfaced & Long Beaded	30 00
Flooring	25 00
do, No. 2	17 00
Rustic, No. 1	25 00
do, No. 2	18 00
Battens, lineal ft	—
Shingles M	2 00

PUGET SOUND PINE
RETAIL PRICE.

Rough, M	15 00
Fencing	15 00
Laths	3 50

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending November 4, 1879.

	Oct. 29	Oct. 30	Oct. 31	Nov. 1	Nov. 2	Nov. 3	Nov. 4
HIGHEST AND LOWEST BAROMETER.							
	29.962	30.003	30.149	30.235	30.241	30.239	30.244
	20.884	29.927	30.021	30.170	30.154	30.180	30.186
MAXIMUM AND MINIMUM THERMOMETER.							
	70	59	64	62	63	62	60
	55	52	56	54	54	53	53
MEAN DAILY HUMIDITY.							
	73	79.7	69	76.8	78	86	81.7
PREVAILING WIND.							
	W	SW	SW	W	N	W	W
WIND—MILES TRAVELED.							
	93	201	127	95	159	197	
STATE OF WEATHER.							
	Fair.	Cloudy	Fair.	Fair.	Fair.	Clear.	Fair.
RAINFALL IN TWENTY-FOUR HOURS.							

Total rain during the season, from July 1, 1879. 0.81 in.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Butte Hydraulic Mining Company.—Principal place of business, San Francisco, California. Location of works, Butte county, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 31st day of October, 1879, an assessment of Ten Dollars per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary, at room 3, No. 220 Sansome street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 2nd day of December, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the Twenty-second day of December, 1879, to pay the delinquent assessment, together with the cost of advertising and expenses of sale.

L. L. DENNERY, Secretary.

Office, Room 3, No. 220 Sansome st., S. F., Cal.

Numa Mining Company.—Principal Place of business, San Francisco, California. Location of works, Humboldt County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 23rd day of October, 1879, an assessment (No. 2) of Two Cents (2) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 328 Montgomery St, room 21, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 24th day of November, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 15th day of December, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

DAVID WILDER, Secretary.

Office, 328 Montgomery St., Room 21, San Francisco, Cal.

Land Purchasers' Association.—Location of principal place of business, San Francisco, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 5th day of November, 1879, an assessment of six dollars ($6) per share (being the balance of the 43d installment on the subscription to the stock), was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at No. 641 Sacramento street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 4th day of December, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before will be sold on Saturday, the Third (3d) day of January, 1880, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors.

C. S. WRIGHT, Secretary.

No. 641 Sacramento street, San Francisco, Cal.

Orion Mining Company.—Location of principal place of business, San Francisco, California. Location of works, Iowa Hill, Placer County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 9th day of October, 1879, an assessment (No. 5) of Thirty (30) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 28 Sansome street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 10th day of November, 1879, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on Tuesday, the 25th day of November, 1879, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors.

P. CONKLIN, Secretary.

Office, No. 28 Sansome St. (up-stairs) San Francisco, Cal.

The Pacific Land and Trust Company.—Location of principal place of business, 513 California street, San Francisco, Cal.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 1) levied on the Eighteenth day of September, 1879, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Am't.
Benj. Flint	1	100	$125 00
D W F Bishee	8	100	125 00
E W Steele	4	100	125 00
John A Ledden	5	100	125 00
R P Layton	7	100	125 00
Benj. Flint	16	520	650 00
E P Billings	18	40	50 00
R P Layton	20	1600	2000 00

And in accordance with law and an order of the Board of Directors made on the 18th day of September, 1879, so many shares of each parcel of said stock as may be necessary will be sold at public auction at the office of the Pacific Land and Trust Company, 513 California street, on the 15th day of November, 1879, at the hour of two o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

WM. ANDREWS, JR., Secretary.

Office, 513 California street, San Francisco, Cal.

Dividend Notice.—Office of Belle Isle Mining Company, San Francisco, Cal., October 31st, 1879.

At a meeting of the Board of Directors of the above named Company, held this day, dividend (No. 5) of Seventy-five Cents (75c.) per share was declared, payable on Wednesday, the Fifth day of November, 1879. Transfer books close this day at 3 o'clock P. M.

R. H. BROWN, Secretary.

Office, room 20, San Francisco Stock Exchange, San Francisco, California.

Annual Meeting.—Maryland Consolidated Gold and Silver Mining Company.

The annual meeting of the stockholders of the Maryland Consolidated Gold and Silver Mining Company, for the election of Directors for the ensuing year, and for the transaction of such other business as may properly come before the meeting, will be held at the office of the Company, No. 202 Sansome St., room 1, on the Fourteenth day of November (second Friday), 1879, at 1 o'clock P. M. Transfer books will be closed Tuesday, November 4th, at 3 P. M.

E. P. FARNSWORTH, Secretary.

ANNUAL MEETING.

Napa Consolidated Quicksilver Mining Company.

The regular annual meeting of the Napa Consolidated Quicksilver Mining Company will be held at the office of the Company, room 7, Safe Deposit Building, 328 Montgomery street, San Francisco, California, on Wednesday, the twelfth day of November, 1879, at the hour of 2 P. M., for the purpose of electing a Board of Directors to serve during the ensuing year, and the transaction of such other business as may come before the meeting. Transfer books will close on Saturday, November 8th, 1879.

WM. W. PARRISH, Secretary.

Office, room 7, Safe Deposit Building, 328 Montgomery street, San Francisco, California.

POSTPONEMENT.

Diana Mining Company.

The day of delinquency of the above assessment is postponed to November 17th, 1879, and the day of sale to Friday, the Fifth day of December, 1879. By order of the Board of Trustees.

J. T. McCEOGHEHAN, Secretary.

Office, 318 Pine St., rooms 13 and 14, San Francisco.

Amusements.

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THOMAS MACUIRE ..... Manager.
CHAS. H. COODWIN ..... Treasurer.
J. P. CHAPMAN ..... Assistant Treasurer.
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JOHN E. OWENS.
Box office, for sale of reserved seats, now open.

BUSH STREET THEATER.
CHAS. E. LOCKE ..... Lessee and Manager
COLVILLE OPERA BURLESQUE CO.
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Iron and Machine Works.

THOS. PENDERGAST. HENRY S. SMITH.

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ALL STYLES OF FANCY HEAD BOLTS.

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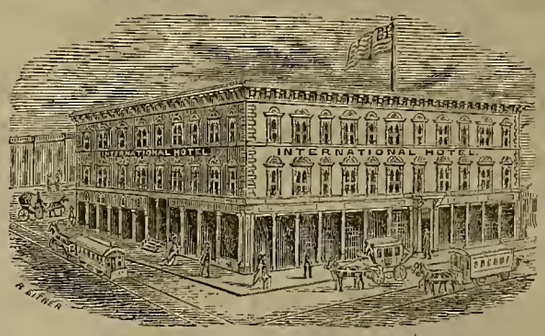

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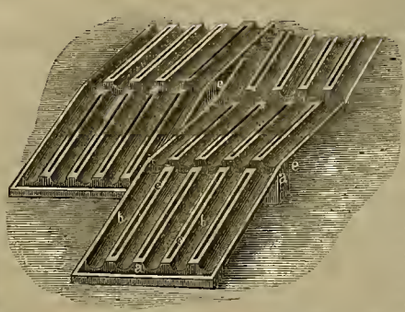

This invention meets a want which has long been felt by Gravel Miners and Millmen, viz.: that of a simple, cheap Riffle which will save the largest possible amount of gold or sulphurets, with the least possible waste of quicksilver. That this Riffle answers all these conditions will be apparent to any practical man who takes the trouble to examine it. The arrangement of this Riffle is such that there is a strong, unobstructed upper-current to carry off and break up the gravel or cement, and a slow under-current, checked by numerous riffles, which give gold or sulphurets a better opportunity of settling than if they were exposed to the force of the main current.

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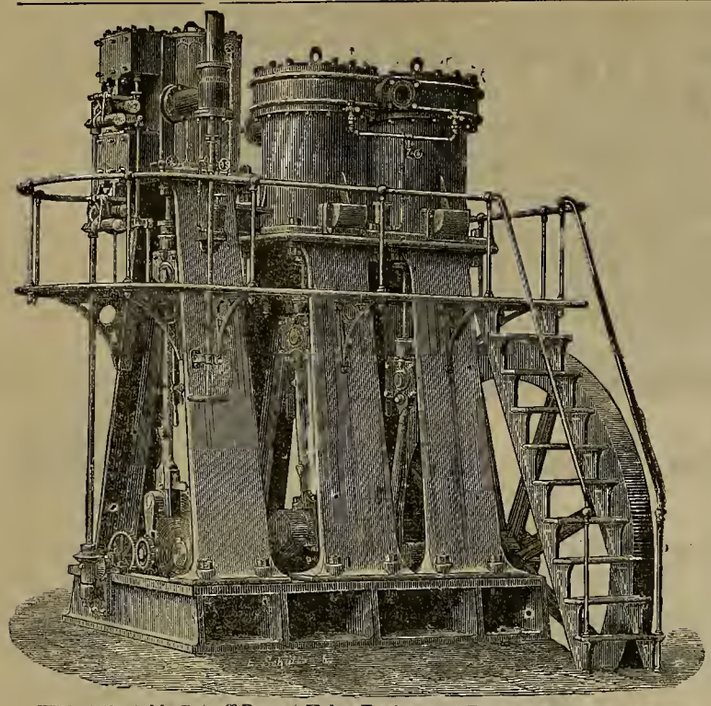

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At a special meeting of the stockholders of the above named Company, held this day, a Stock Dividend of 20 per cent. was declared, payable immediately, out of the capital stock owned by the Company.

All stockholders are requested to send their stock to the office of the Company before NOVEMBER 24th, 1879, and receive the dividend due thereon.

WM. W. PARRISH, Secretary.

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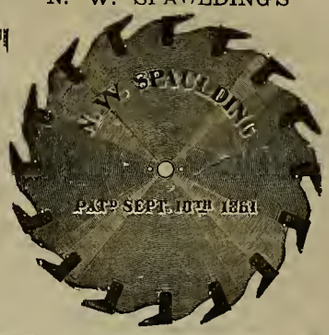

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. · SAN FRANCISCO, SATURDAY, NOVEMBER 15, 1879. VOLUME XXXIX Number 20.

A New Mining Law.

A new mining law has been drafted by Congressman Belford, of Colorado, which it is intended to introduce at the next session of Congress. It has been published in the Colorado papers, in order that miners and others interested may have opportunity to criticize it and suggest amendments. The proposed law is as follows:

"Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled.

"That hereafter any persons desirous of prospecting and exploring the public domain of the United States for the discovery of deposits of gold and silver-bearing ore, which do not outcrop or appear on the surface, may locate a mining claim 1,500 feet in length and 600 feet in width, which location shall be made by marking the boundaries of the same on the surface of the ground by at least six substantial stakes, one at each corner of the claim and one at the center of each side line.

"After the making of said location, the party making the same shall have 90 days within which to expose and define the mineral deposit, which may be done either by the sinking of a discovery shaft, or by an open cut, crosscut or tunnel. If within said period of 90 days, he shall fail to expose said mineral deposit, his location shall be void, and the claims so located shall be open to re-location in the same manner as if no location of the same had ever been made.

"No person discovering a mineral deposit under this act shall have the right to follow it beyond the point where it is intersected by the exterior lines of the claim; nor shall any person under this act be allowed to locate a second claim in the same mining district, until he has perfected his title to the first located claim by an exposure of the mineral deposit therein, in the manner above set forth and by recording the same as required by law.

"Provided, this act shall not apply to mining claims on veins or lodes of quartz found between well-defined walls of rock in place."

It is quite probable that proposed changes in the mining laws will be suggested to the next Congress. That changes should be made admits of no argument, but the importance of changes for the better cannot be over-estimated. It is less difficult to make the law incomprehensible than it is to clear away its inaccuracies. If the proposed law of Judge Belford's is intended to be a new law, it does not repeal any of the legislation under which mining is now conducted, except by inconsistency, which is one of the worst features in any law, since it compels a law suit to decide upon whether the construction is compatible or not with any preceding law. The bill belongs to that feature known as special legislation, and leaves the door open to unsurmountable difficulties. It provides stakes as the evidence of location, to be proven by oral testimony, leaving the recording of the claim out altogether, thus increasing the troubles of the miners.

Veins and lodes are especially excepted from the operation of the act by the *proviso* at the end, and hence refers exclusively to placer claims, and affords no relief.

The proposed bill fails to give any special protection to the miner, since it leaves the location open to exploration until ore deposits are discovered. The period of 90 days amounts to nothing and is worse than nothing in the present law, because every miner has 90 days in any event, while here he must find an ore deposit within that time or give up the claim to others. It provides not for the indigent miner, who may have reason to believe he has an ore deposit, but has not the present means to find it within the required 90 days, while the heavier purse can stand quietly by and take possession at the end of the required time.

The nature of the ore deposits of Colorado and Utah are different than those in California, and hence the law now in force is difficult of application. The changes to be made, however, will, it is hoped, remove the difficulties experienced in those localities without, at the same time, doing injustice to the deposits of this State and of Nevada. It would seem, from the very nature of the differences, that special legislation would be necessary, but that would be worse than the present law. We need above all things some uniform system which will deliver the miner from geological technicalities; not a system which, for instance, will, like Judge Belford's proposed law, put the carbonate deposits out of the legal category of veins, and leave the deposits of other districts in their present status. The bill itself does not do this, although intended, but increases the difficulties of the situation by endeavoring to make it applicable to deposits elsewhere of an entirely different nature.

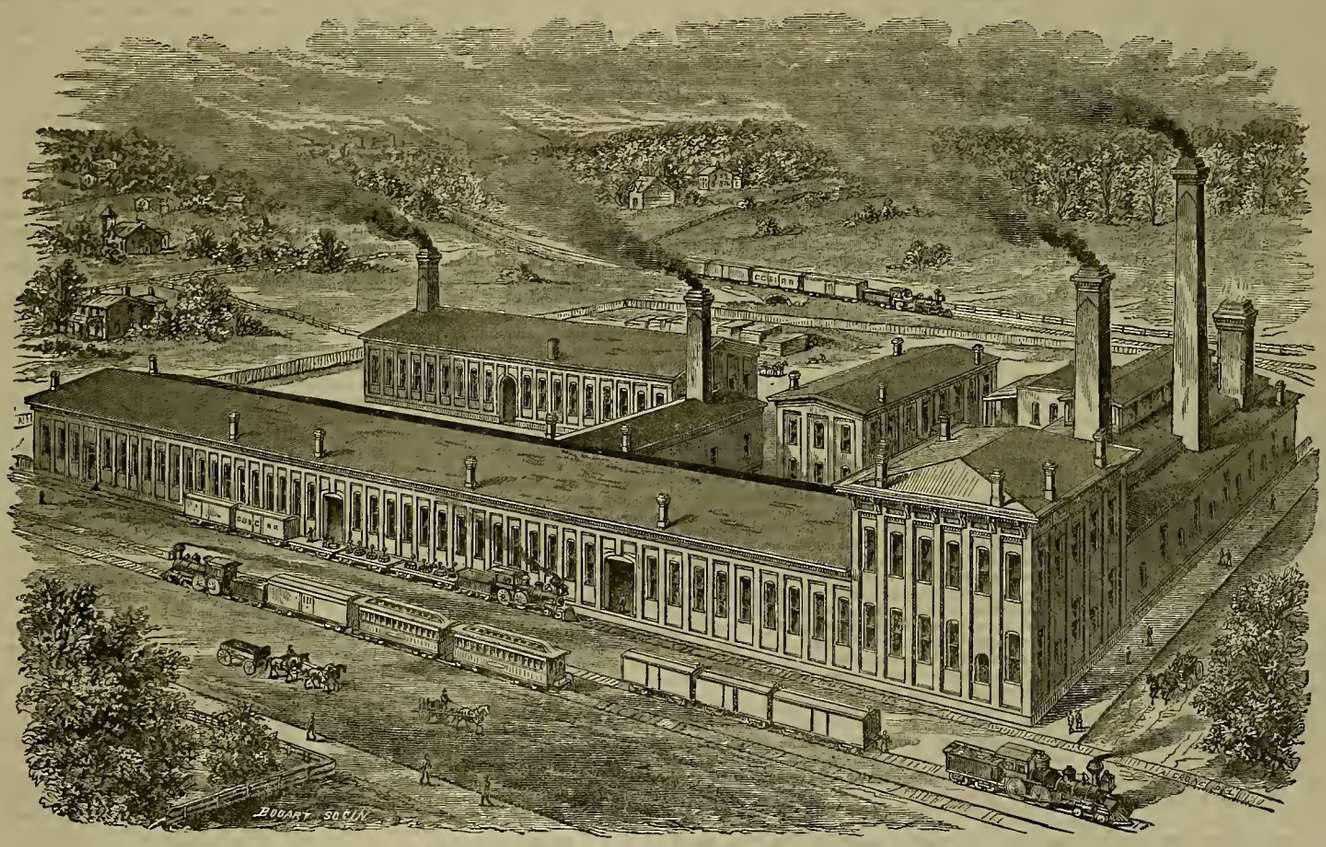
Leffel & Co's New Works.

We present herewith an engraving representing the new works of James Leffel & Co., Springfield, Ohio. The manufacturers of the well-known Leffel improved double turbine water-wheel, have found that their facilities were unequal to the growing demands of their business and have, therefore, constructed the new buildings shown, fitted throughout with the most improved and expensive machinery made especially for the firm.

The buildings cover several acres of ground. The main building is occupied principally by the machine shop, and the L contains the foundry. Besides these, there are large pattern shops, pattern rooms, blacksmith shops, core rooms, and offices, as well as projected boiler shops, etc., which are detached from the main building. These works form the most extensive and thoroughly equipped establishment in the world for the manufacture of water wheels.

The heavy nature of much of the work done by the firm, renders it desirable that most of the shops be on the ground floor; a portion of the main building, pattern shops, etc., are, however, two stories high. All the departments have ample capacity, are conveniently arranged and well lighted.

There are over 8,000 of the Leffel wheels at work in different places and under all sorts of circumstances, a fact which indicates clearly their popularity. The various parts of the wheel have been greatly improved. Among the most noticeable modifications and additions made (some of which are patented), are the improved link for operating the gates; the process for lining the iron plates with brass or any anti-corrosive metal; the combination of the toothed segment with the gate-arm in such a manner that the segment can be removed when the teeth become worn and a new one supplied; the spherical iron penstock; the use of steel as guides for most of the sizes, instead of iron; and the improved method of casting solidly in one piece both wheels, by which means the edge of the diaphragm can be made much thinner and yet stronger, assisting to separate more perfectly the due proportion of water to each wheel. Half the buckets being made of good boiler iron, they are not liable to break or tear out any of them. Any part of the wheel, accidentally broken, can at once be duplicated. Efficiency as the wheel has been, by the aid of new and special machinery the working parts will be characterized by even better workmanship than heretofore.



NEW MANUFACTORY OF THE LEFFEL TURBINE WATER WHEEL.

SIGN OF PROSPERITY.—The *Arizona Citizen* notes as an indication of prosperity the gradual increase of litigation stimulated by the rich mining developments in the various mining districts, and quotes a favorite remark of A. T. Stewart, who whenever he desired to know of the financial importance of a place, always inquired the number of lawyers in that place, for said he, "where there is an abundance of lawyers there is always plenty of business." We judge, says the *Expositor*, by this standard Tucson to be the most prosperous town on the planet.

IT is said Bismarck is not only suffering from his old neuralgic complaints, but symptoms of a constitutional malady have appeared, causing some apprehension.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Alpine County Mining.

EDITORS PRESS:—In looking through the columns of your valuable paper we never see an item regarding the mining progress of Alpine county, and still our county could furnish you with very interesting material regarding the very successful treatment of our most rebellious ores. Our county, like other mining districts, had its time of excitement. Capital came in, mines were opened and large mills were built, but, to the great loss of the investors, it was soon found that our ore was too rebellious to be worked successfully. One camp after the other, with nice mineral deposits in sight, died of consumption. Amalgamation, the Freiberg process, leaching, and several other processes had been tried, but without success, till finally the whole county had almost been deserted. One company, the "Advance," however, showed more endurance than the balance, and kept up working and experimenting, though without success, till July, 1878, when they engaged Mr. Ottokar Hofmann, a Freiberg man, and one of the best metallurgists of the coast, who, without any previous experiment, put up his vats and pipes, and inside of two weeks commenced to ship bullion. Alpine county had not been used to ship bullion, and Mr. Hofmann's success created quite a sensation, and gave hope and confidence to the old settlers. The problem of working our rebellious ore had been solved at last. Mr. Hofmann, however, left us soon, as other business called him back to San Francisco, and the Advance company did not survive his departure long, as previous fruitless experiments brought it in heavy debt, which caused the property to be attached by the creditors.

On the strength of Mr. Hofmann's success the Colorado No. 2 G. & S. M. company formed itself last winter and brought the Tarschish property for about $20,000. This property is the best in the county, and comprises a valuable mine and a 20-stamp mill in first-class condition. This property belonged to Mr. Hunter, and was lying idle for many years, as the ore could not be worked. It was an elephant to its owner, who was glad to sell it at the above named paltry sum.

The company engaged Mr. Hofmann, who came up last spring. As soon as he arrived, new life commenced at Monitor. Everybody looked in a bright future. They knew if there was a man to make a success of the new enterprise it was him; and they had not been mistaken. With the small sum of 10 cents assessment on 40,000 shares, as working capital, he started in, tore out the pans, settlers, etc., put up four Frue's concentrators, leaching vats, furnaces, etc., and in a very short time shipped bullion. Who knows the rebellious nature of our ore, containing about equal per cent. in value of gold and silver, and who is familiar with the many previous experiments and failures, has to give great credit to Mr. Hofmann, who, by his ingenious process and thorough knowledge, had such a startling success.

I communicate these facts to you as they may be of great value to many of your readers who are in the same situation as we were during so many years.

In concluding allow me to express my thanks to Mr. Hofmann, who was of such great benefit to the county. In doing so, I am sure to express the sentiment of the people of Alpine county. X.

Monitor, Alpine Co.

El Dorado County Mines.

EDITORS PRESS:—The Crystal mine at Frenchtown is a recent and promising re-location by Messrs. Morrison & Phelps, of Shingle Springs. It is a little remarkable that some of the best quartz mines of El Dorado county are old claims under new names, or re-locations of mines once partially opened and worked and finally abandoned as unprofitable. Failures took place, in some instances, from mismanagement, extravagance, want of necessary skill, experience, and gold-saving appliances; in others, from high prices ruling at the time for labor, machinery and incidentals, to say nothing of the lack of the necessary capital to prosecute the work to a successful termination.

It was from such or similar causes that the mine now known as the Crystal was laid, like so many others, on the shelf. In this day, when $5 rock under similar conditions is made to pay, it is difficult to realize a failure with quartz represented to average $15 per ton from a vein six feet wide, and a good mill near the mouth of the tunnel. The tailings are said to have been rich, a sufficient amount of gold having been cleaned up from the mortar blocks under the battery to pay the purchase price of the mill when removed. The present owners are very sanguine that they have struck a good thing. They have stripped the surface of the ledge for 200 feet in length and 25 feet in width, and find much of it prospecting well in free gold. They claim a chimney of ore about 300 feet in length by 60 feet in width, from which thousands of tons can be thrown down in readiness for the mill by the simple process of quarrying it out, the greater portion of which, they hope, will give good returns. The ledge has a species of green slate on the western wall, and syenite on the eastern, and is traceable a considerable distance north and south. They are understood to be making arrangements for the removal of an eight-stamp mill to the mine, to which other stamps can be added after thoroughly testing the ore. *

The Ailanthus Silkworm.

EDITORS PRESS:—I have seen in some of the papers a small item alluding to a new kind of silkworm from China, tested by M. Ledoux, and regarded as superior to those with which experiments have formerly been made in this country. Can you give us fuller information about it?—I. C. W., Mission San Jose, Cal.

This insect to which reference is made is the "ailanthus silkworm" (*Attacus* [*Samia*] *cynthia*), called *ailanthus* because of its feeding naturally on the tree of that name (*ailanthus*, or ailantus—"tree of heaven.") This silkworm cannot be called new, for it has been known more than a century to entomologists and has been advocated for culture for many years. It is grown in Europe, and Prof. Riley says it has become so common in some parts of the Eastern States as to be a nuisance. What there is new in the item to which our correspondent alludes is the work of M. Ledoux, and that lies in a discovery or process for securing the silk from the cocoon.

At the last meeting of the American Association for the Advancement of Science, held in July last, a paper was read upon the ailanthus silkworm by Prof. C. V. Riley, U. S. Entomologist, which is a full review of the insect and the possibilities with it, and would be read with interest by all sericulturists. Such space as we have at command will only enable us to glance at the comparison which Prof. Riley makes between the culture of the ailanthus worm and the mulberry worm, and this, we believe, is what our correspondent most desires to know.

In brief, the culture of the ailanthus worm is an out-door affair; that of the mulberry worm, is an indoor industry. Prof. Riley says of the former species: There is little trouble in raising the worms. It is best to raise them in the open air, care being taken to protect them from attacks of birds and predaceous insects, such as ants, ground beetles, etc. The trees, however, may be trimmed that an awning of some light material could be stretched over them during the feeding season. A few cocoons, well chosen for size and quality, might be left on the trees for breeding purposes, and the moths as they issue would soon pair naturally and the females deposit their eggs upon the branches of the trees. Two broods can easily be produced each year, and the time of hatching of the eggs, of the issuing of the moth, and that required for the development of the worm, depends so much on the temperature, that the broods can be produced at the seasons most convenient and favorable. When this control is denied, the eggs and the cocoons must be properly managed. The cocoons intended for breeding purposes may be suspended in chaplets, so that the moths may issue more readily and have a good opportunity to hang their damp wings as they expand. They may then be coupled and placed in wicker boxes or any other well ventilated vessel, from which the eggs, when laid, can be easily removed. The eggs when about to hatch may be fastened to the trees in various ways, so that the young worms, from the first moment of their lives, will find the leaves convenient. They may be pasted on to thin wood, paper or linen, and pinned in small quantities to the leaf stalk; or portioned into lots of fifty, or hundred, and suspended in small muslin bags pinned near a leaf. The young worms are gregarious and generally remain on the side of the leaves; and as they do not consume much at this period, and are more liable to the attacks of their enemies, it may be found profitable to rear them during the first stage indoors upon cut branches or young trees in pots.

The silk of the ailanthus worm is no doubt very valuable, but to what extent, depends on our ability to manufacture it successfully. It has several disadvantages, but native ingenuity may devise some means to overcome them or turn them to account. The value of any silkworm depends on our ability to unwind its cocoon. I cannot see from the accounts that have so far reached that M. Ledoux's invention accomplishes anything more than that of former inventors, and, whatever impetus it may give to *ailanti*-culture, we may rest perfectly satisfied that such culture will never become general, and that the *ailanthus* silkworm will never replace that of the mulberry.

The prime reason why the mulberry silkworm must ever be the silk producer of commerce, aside from the superior quality and quantity of its silk, is that it is a domesticated insect and that the worm can be fed in large quantities in partial confinement and under control; further, that, while enduring this artificial life, it shows no disposition to escape from the shallow trays upon which it is fed. All the other worms suffer more or less when brought together in large numbers, or when confined or sheltered, and in this fact more than in any difficulty in using the silk, lies the secret of the failure to substitute any of them for *mori*. The hardiness and adaptability of Cynthia to different climates cannot offset this objection; for it remains essentially a wild worm, and it will require many centuries of selecting and artificial rearing ere it can be domesticated to the same extent that is the *Sericaria mori*. There never can be any dependence placed on the production of silk from worms growing wild on their food-plants, as in such state their exposure to birds and other enemies will always render the cocoon harvest uncertain, and it is far more expensive and troublesome to protect both the wild worms and the trees on which they grow, than it is to rear the mulberry worm by the ordinary methods employed.

Imported Game Birds.

EDITORS PRESS:—Can you tell us what has become of the Eastern quail and Australian pheasants, which were introduced some time ago in the hope that they would enrich our game resources, etc.—S., San Francisco.

We sought information on these points from Hon. B. B. Redding, of the California Fish Commission, as it was under the auspices of the commission that the praiseworthy attempts at acclimatization were made. The Eastern quail were set free in two localities. In the Montezuma hills in Contra Costa county they have done well, and have become quite numerous, because they were preserved by the farmers, who would not allow them to be shot. Those liberated near Woodland, in Yolo county, were all killed and marketed within three months.

The English pheasants were set free two years ago upon Goat island, San Francisco bay. The first year they were preserved by Gen. McDowell's order prohibiting shooting on the the island, and the pheasants were frequently seen, but have not been observed since then. Their loss is accounted for by two surmises. One is that the birds may have flown to the main land. Another is that they have all been captured by the great number of cats which live in a wild state upon the island. These cats are the offspring of numerous garrison felines, which were left upon the island when the soldiers were withdrawn, and which have lapsed into a wild-cat style of life. Another lot of pheasants were set free two months ago upon land owned by the Spring Valley Water Co., near one of their reservoirs. As no hunting is allowed upon this land the birds have escaped the huntsman. They have been carefully preserved and fed, and under these favorable conditions have prospered thus far. They have remained near the place where they were liberated and are occasionally seen. It is probable that they will nest next year and firmly establish themselves.

The wild turkeys of the northwest, which were placed upon Santa Cruz island by Judge Caton, have found plenty of food, and are reported to have shown signs of increase and permanent residence.

Mr. Redding suggests the great advantage of introducing the migratory quail of Europe, of which we gave a description and illustration in our issue of May 17th, 1879. This bird has been introduced by the hundreds in Vermont and Massachusetts, the stock being brought from Messina. The species is very destructive of grasshoppers and other field insects, and thus could do excellent service in our valleys, which are occasionally afflicted with such pests. As the bird is migratory in its habits, it might find congenial southern residence in Arizona and Mexico. For a northern home it could select its habitation according to its tastes, as our State from mountains to coast could somewhere suitany liking of the bird. This quail is most rapid in its multiplication, and being a good game bird would please the hunter as well as the farmer, whose crops it might help to guard from destroying insects.

Mr. Redding mentions the advisability of the appointment of a commission to secure and introduce valuable foreign birds to this State, and the suggestion is one we can heartily approve. Many competent, and public-spirited men could be found who would do the service without pecuniary compensation, merely for the satisfaction of enriching the State in the direction of feathered treasures. Their work would be analogous to that of the fish commission, and the gentlemen composing that body (although Mr. Redding did *not* mention it), are doing a public service, which is already showing its value by evidence which is as tangible as a man's breakfast. We trust the creation of an acclimatization commission to secure the introduction of valuable insectivorous birds will be one of the benefits conferred upon our great producing interest by the coming Legislature.

Tuolumne County.

EDITORS PRESS:—This is truly the land of excitement and the home of plenty, from an "orphan squash" to a "barley" flower, from Bodie to Tioga. And now we have a mineral bonanza, bordering the great plains, on Widow Olsen's land. The find is some four miles from La Grange, on the Tuolumne, twenty miles from Sonora and eight miles from my place, in a southerly direction. The vein is 12 feet wide, red-burned quartz, almost of a porphyry nature, and unlike any other vein ever found in this State. The main find has been sold by the prospectors, and bonded to capitalists by Mrs. Olsen for some $20,000. Croppings and locations have been made miles apart from the first find, on Dennis Phalen's property. Capitalists are excited, workmen are on the ground, houses are being erected, and before the outside world learns of the rich strike, a small town will spring up where sheep used to roam. Truly this is a wonder land. JOHN TAYLOR.

Mt. Pleasant, Tuolumne Co., Cal.

Resources of Inyo County.

The Inyo *Independent*, in its issue of October 18th, in speaking of the gold belts of Inyo, says that the "water courses debouching into Blind Spring valley are rich in float gold ore." While we acknowledge that there has been one or two dry washes wherein float quartz has been found, we cannot agree with the *Independent* as to its richness. There has never been any found in that section that would warrant the expenditure of much time or money, and the writer hereof has spent considerable time in prospecting in that part of the country. While in the White Mountain range, after coming south from and leaving Montgomery canyon, no gold is found until the slate belt is reached near Piute district, and the silver-bearing quartz between Piute and Montgomery districts is so nominal in value and so base in character that it will not pay the expenses of working. Another great drawback is the inaccessibility of the canyons and the abruptness of the western slope of the range. There can be no doubt but what there exists some extensive ledges near the heads of some of these water courses; and we have been told by prospectors that there is an immense ledge of gold and silver-bearing quartz on the extreme summit of the White mountains, commencing at a point nearly opposite Whisky flats and running southerly, assaying from $12 to $20 in gold and silver, that can be traced a long distance, and which has never been thoroughly prospected, and may be the main lode of the mountains. Further south on the range, and a few miles south of the head of Silver canyon, Messrs. Russel & Givens have done a great amount of work, and found some ore which assays up in the hundreds, and there were several tunnels run and considerable prospecting done in Silver and other canyons during the excitement in the days of old Owensville. Since then little or nothing has been done by any one who can lay claim to the name of a thorough prospector. Further south, as the *Independent* truly says, there has been rich discoveries of gold-bearing quartz made. And then comes the almost inexhaustible base metal deposits of the Cerro Gordo mountains, where immense quantities of rich ore have been reduced. And then the Darwin mines and those of Lookout, Panamint and Wild Rose districts, which as yet have not proved a success, although these ledges have been very rich on the surface they have with one or two exceptions either become barren or else the ore was found to be of too low grade to be worked with profit. This same base metal range can be traced into the Armagosa range on the eastern side of Death valley, some good ledges having been found in the low range of red hills directly east of Wild Rose. The ore in the New Armagosa district (which was known as the old Franklin district) carries about equal quantities of gold and silver, with a large percentage of lead.

Many deposits of lead ores of various grades have been found on this range, some rich and some assaying nothing in precious metals, until Resting Springs is reached, where the silver-bearing rock is much richer but found in smaller quantities. Crossing back to the westward we find a few good small deposits of gold-bearing quartz in the vicinity of Snow's canyon; and still further westward there could undoubtedly be found, by careful and proper prospecting, some good gold fields in the old Coso district in what is known as the Slate range. Taken all in all, Inyo county presents one of the most fertile fields for men of pluck and energy to prospect in of any portion of the country. And not only is it a good field for the miner, but here the farmer will find tens of thousands of acres of rich agricultural land that can be homesteaded, and on which, by running ditches, plenty of water can be obtained for irrigation. The one thing needed now to make this one of the most prosperous farming and mining portions of California, is cheap transportation. One great step toward this splendid result is already about to be accomplished, mainly through the efforts of our neighbors across the Sierras, in the construction of the Mammoth City and Fresno Flats wagon road. By means of this opening a new impetus will be given to traffic through this region; and in the near future, when men of capital see the immense advantages of the project, why may we not hope for a narrow-gauge railroad to connect the C. P. R. R. with S. P. R. R. at or near Mohave, thus opening up a country almost unknown, but of unbounded wealth and fertility.

SUBTERRANEAN FOSSIL FOREST.—In the neighborhood of Rotenburg, on the Fulda, Germany, the geologist, Dr. Moesta, has discovered a subterranean oak forest at a depth of eight feet under the ground. The number of well preserved trunks is enormous. The wood is as black as Irish bog oak, in consequence of the influence of water for centuries, but it is hard and sound, and forms an excellent material for wood carving and mosaic. The size of the trunks is astonishing. One of them, about 57 feet in length and 5 feet in breadth, has been preserved for exhibition in the Royal Museum at Berlin. The forest evidently belongs to a very remote period in the formation of our globe.

THE following is an analysis of a piece of modern English calico: Cotton, 53; china clay, 26; starch, 12; fatty matter, 2.5; chloride of magnesium, 2; chloride of zinc, 1.5; chloride of calcium, 0.5; moisture, 2.5; 100.0.

MECHANICAL PROGRESS.

Blasting by Compressed Air.

Extensive experiments are now being made at the Pemberton colliery, near Liverpool, in the Reuss system of blasting with compressed air. The plan consists in boring a hole in the coal, inserting a cast-iron cartridge 16 inches long and 3 inches in diameter, and exploding it by compressing air into it. The cartridge is ½ inch thick, and is connected to the air pumps by weldless steel pipes ½ inch outside diameter, and a bare ½ inch bore. The explosion takes place when a pressure of about 8,500 pounds per square inch is reached. The air pumps are mounted on a small trolly which can accommodate its gauge from a minimum of 20 inches upward, the total hight of the machine being 33 inches, the width 4 feet 3 inches, and the weight 8 cwt. There are six pumps worked by three cranks on one shaft, and although the enormous pressure required is quickly gained, the pumps are perfectly independent, and the stage process is not used. They are driven by crank handles worked by two colliers and geared three to one on the pumps, which latter made 54 to 60 strokes per minute. The rams are ¾-inch in diameter by 10-inch stroke, and work in the barrels without any packing, which is certainly a most remarkable feat considering the pressure attained. There are no suction valves, the admission of the air taking place through holes in the sides of each barrel, which are uncovered when the plunger is at the top of its stroke. The delivery valves are of lead, and are placed close to the bottoms of the pump barrels, which are all screwed into one block of gun metal, from which the delivery pipes start. The bases of the pumps work in water to keep them cool. A great deal of the success of the operation depends on the truth with which the hole is bored in the coal for the reception of the cast-iron cartridge, and to accomplish this Mr. Reuss uses a small universal hand-drilling machine, the supporting bar for which is made fast to the face of the coal by expanding wedges at its foot let into a hole jumped in the coal for this purpose. The cutter for making the cartridge hole has a diamond-pointed center, and cuts on both sides, and clears itself well at the edges. It makes holes about 40 inches deep, into which the cartridges are placed, and well tamped with sagger clay and the borings from the holes just made. The pipes connecting the pumps and the cartridge are joined together with couplings, having soft copper washers placed between the ends of the pipes to insure tight joints, and the last length of pipe is screwed into the end of the cartridge, which is increased in thickness for this purpose.

CURIOSITY FOR PIANO PLAYERS—At a late musical festival in Worcester, Mass., a spinet was exhibited bearing the inscription: "Jacobus Kirchmann, Fecit Londini, 1755." The year 1710 or 1711 witnessed the invention of the pianoforte, but its introduction to general use was very gradual. Haydn, Mozart, Beethoven and musicians of their day undoubtedly used the spinet or the larger instrument of the same family, the harpsichord. This instrument above mentioned, is in shape somewhat like a grand pianoforte; in dimensions 7½ feet on the straight side, 3 feet at the keyboard-end with a depth of case of 11½ inches. It rests upon a standard, which is detachable and easily folded together. It has no pedals, but knobs at the sides of the keyboard allow mechanism to give or take of extra volume of tone. The "action," so-called, consists of a "jack" at the end of the lever, a wooden upright, with projecting pieces of leather to twang the string as it passes upward, and a little cloth damper to stop the vibration when the jack is lowered. The strings were of copper, brass and steel, the lowest of about the same dimensions as the highest in modern pianofortes. The "eyes" at the further end of the strings were as regularly and evenly made as those of the present day, while the tuning ends were merely wound about the pins, without passing through holes in them. Five octaves of keys give tones from the fourth line below the base staff to the fourth space above the treble.

THE BRACHYTELESCOPE.—In conjunction with Forster, Fritsch, the well-known Viennese instrument maker, has brought out a reflecting telescope, which has now been long enough before the public to secure a certain amount of approbation. The rather equivocal name, brachytelescope, has been given to this instrument on account of the shortness of its tube. The telescope is so light that it can be lifted about with its stand from place to place by a single pair of hands, a telescope of ordinary construction being, for the same power, of far greater length and weight. The rays of light sent from the object fall first upon the large concave reflector inclined at any determined angle to the optical axis of the instrument, and converge thence to fall without obstruction on the small convex mirror placed at the top part of the apparatus. The image is formed behind the large reflector, when it is seen magnified through the lens in the eyepiece. Both mirrors are made of silvered glass, and have parabolic surfaces. The instrument does a great deal of work at a low cost. With a four-inch reflector the double stars, *gamma* Virginis, *beta* orionis, the Polar star, the pair of double stars, *eta* Lyræ, etc., are distinctly separated.

New Testing Machine.

A testing machine constructed at the works of the Paris, Lyons and Mediterranean Railway Company at Paris (M. E. Marie, engineer-in-chief), is the most important machine of its kind. It is designed simply for tension, and arranged for a maximum pull of 100,000 kilogrammes, or nearly 100 tons. The whole construction of the machine is exceedingly simple. The test piece is connected at its lower end to a rod carried through from a hydraulic ram, working in a vertical cylinder placed below the bedplate. The weight of this rod and the ram, etc., is balanced by a counterweight suspended in a pit under the cylinder, but for the sake of avoiding shocks the connection between the chains and the counterweight is not direct, but through a system of springs conveniently placed within the counterweight.

The upper end of the test piece is carried by a link from knife-edges on the principal lever, from which the pull is transmitted to a second lever above the machine and thence down to the steelyard, which is placed conveniently for reading at the side of the machine. The maximum obtainable leverage is 600 to 1. The weight of the system of levers is counterbalanced by a special lever on the top of the machine. The weight on the steelyard is movable by means of a screw, and the load can be read either on a scale on the steelyard itself or on the peripheries of a system of graduated disks, arranged with a differential motion, placed at the outer end of it. This allows the load to be measured to (approximately) 0.005 of a kilogramme.

The hydraulic pressure is obtained either by a three-ram pump, from an accumulator, or by one of Thomasset's compressors. The extensions are measured by a kathetometer specially arranged for the purpose which allows of estimation to the one-thousandth part of a millimeter. The machine is substantial and well designed, and its workmanship is very good throughout. The test piece itself is well exposed to view, as are the different parts, which also—except that they are a considerable hight from the ground—are very accessible. We may add that a drawing of a machine on the same system intended to test chains has been exhibited by the same company. The chain is placed horizontally, of course, and the machine can take in a length of 30 meters, and exert a maximum effort of 100,000 kilos.—*Engineering.*

THE RAILROAD UP MT. VESUVIUS.—The latest reports from Naples represent the railway destined to carry tourists to the top of Vesuvius as progressing fast towards completion, and the walls of the station which forms its terminus, are already rising above the ground. The line is to be laid along the western slope of the mountain, and will be rather less than 1,000 yards in length. The station itself, which stands at the bottom of the volcanic cone, is 2,500 feet above the level of the sea, and the line rises rapidly from thence to the verge of the crater, at an incline which averages 56 feet in the 100, but reaches at its steepest part as much as 63 in 100. The construction of the railway has been a matter for serious debate, and it is only after long consideration that the projectors determined upon the system planned by the engineer, Olivieri. According to the principle adopted in this plan, the whole of the inclined plane, from top to bottom, is covered with a thick platform of wood resting upon the lava and other crumbling soil, which would of itself be much too unsteady to form a proper bed for the sleepers. Above the cinders and detritus, of which the mountain side is composed, the platform will be like a gigantic raft, and upon it the rails will be laid with ease and regularity. The wheels of the carriages are to be so firmly attached to the rails that they can never jump or slip off, and the trains are to be drawn up by means of two steel cables worked by a steam engine stationed at the bottom of the volcano. They will also be provided with a brake so powerful that even in the unlikely case of a breakage of both cables they can be brought to a standstill very quickly, even in an incline of 50 in 100. The only other difficulty which faced the projectors of the new railway was that of water supply, for it was calculated that the expense of bringing from Resina enough water to supply the engine, would run away with more than all the profits that could reasonably be expected. In order to avoid this alternative, two large reservoirs are being constructed, which are expected, even under the peculiar circumstances of the position, never to run dry.—*London Globe.*

A NEW KIND OF SCALES.—A pair of scales based on the physical law that the weight of a floating body is equal to the weight of the volume of liquid displaced, has been patented by Weckermann, an engineer at Kalk, near Cologne. Two hollow cylinders with closed bottoms, of exactly equal weight and dimensions, serve as floaters, and are introduced into two somewhat larger cylinders, communicating at the lower ends, and partially filled with the supporting liquid. On top of the floaters are placed the weight pans, provided on their inner rim with a pair of indicators precisely opposite each other when the balance is at rest. A weight placed on one platform depresses the cylinder, equilibrium being of course restored by an equal weight on the other side. Reducing the diametere of the floatere increases the sensitiveness of the apparatus.

SCIENTIFIC PROGRESS.

Preservation of Iron from Rust.

Dr. Treumann, of the Hanover Technical High School, says: Iron surfaces exposed to the action of water for any length of time, whether constantly or intermittently, should not be surfaced with boiled oil. It is a commonly admitted fact that water will soften linseed oil varnish even when it has been more or less completely converted to resin. Every painter knows how crushed remnants of paint in the pot can be softened by filling the pot up with water, and letting it stay there some time. Exposed continuously to the action of water, oil colors applied to iron surfaces blister in the course of a few days. Then the paint gets loose, and in the course of a few months is completely destroyed. If the paint has been let down with oil of turpentine or benzine, so as to be laid on thin, the coating endures for some time under water, but is totally destroyed by a few months' continuous immersion. Emulsion is the besetting evil of paints made from solutions of resins in the products of the distillation of tar, in oil of turpentine, in wood or coal tar, in oils, benzine, and the like. They are subject to the same evaporative action and lowering of temperature which is followed by such damage in the case of oil varnish, and therefore have no superiority to it. The chemical composition of some of these substances, too, is such as to be a direct occasion of rust. The products of distillation of wood tar contain acids, and these should be removed completely before use. Such complete removal, however, is very rarely effected. The products of distillation of coal tar occasionally contain salts of ammonia, and are thus a source of injury to iron.

Where water has to be resisted spirit varnish or Dammar lac varnish should be employed instead of oil varnish. Spirit varnish, consisting of alcoholic solutions of resins, occasions cooling by the rapid evaporation of its vehicle, but is less subject to damage by water than the above mentioned substances. The spirit varnish, to be quite safe in using it, should neither contain fat, fatty oils, or tar oils; and, therefore, the matters added to make it flow better should be as sparingly employed as possible. Supposing the spirit varnish to be used in what we may term a normal condition, its power of resisting water will depend on its content of resin. Resins are precipitated from their resinous solutions with water, since they are not soluble in alcohol of a certain degree of dilution. The same thing happens when alcoholic solutions of resins remain in presence of water, and it happens the more rapidly the larger the amount of resin present, and the larger the dilution of the alcohol employed for its solution. The sensitiveness, therefore, of alcoholic solutions of resin to the damp deposited upon the painted surface in consequence of evaporation increases with the proportion of resin, and falls with the proportion of spirit. The conclusion to be drawn from this is, to bring the proportion of resin as low as possible, regard being had to the hardness requisite for the vehicle which has to carry the mineral color.

ECONOMY OF NATURE.—The deep-sea dredging carried on by the American Fish Commission, under the charge of Prof. A. E. Verrill, of Yale, between Sayhrook and the Bay of Fundy, has discovered more than 50 kinds of fish previously unknown, at least in American waters, and many of which are quite palatable. The habits and histories of the different fish and animals are obtained, together with the localities where each species most abounds, what they feed upon, when they breed, and under what circumstances, and their migration. The fishes are opened and the contents of the stomach examined to see what they eat. This is a very important branch of the investigation, and the most that is known in that line has been obtained through the commission's researches. Before that, not even the fishermen knew what was the food supply of the most common fish. That point known, the reason of the absence or presence in a locality of any particular fish could readily be ascertained. Where herring has been found in large quantities one season, would not know them the next, and the reason would be the absence of their favorite food. Their diet is shrimps. The latter feed on almost invisible crustacea, and these again on microscopic creations. The presence of the latter would bring the crustacea, to be followed by the shrimps, the herrings, and the whales and sharks, in the order named. So it is seen what an important part even the most minute things may play in the economy of nature. The knowledge obtained in this branch of the inquiry, will teach the fishermen not to destroy the food supply of their prospective prey.

MOLECULAR CURRENTS.—Ampere asked if the molecular currents of magnets are entirely created in the magnetic substance during magnetization, or if the magnetizing cause merely determines a circulation of currents pre-existing in the metals in their natural state. He inclined to the latter opinion. The author thinks that there is every reason to admit, with Ampere, that the particular currents pre-exist in the magnetic metals, and that the current of the battery merely determines the circulation and the direction.—*M. Treve, in Comptes Rendus.*

TRIANGULATION OF NEW YORK STATE.—In a recent lecture at Rochester, Prof. James T. Gardner, Director of the State Survey, gave the following explanation of the method of triangulation adopted in making the survey of the State: The first work of triangulation is to select a point on a hill, dig a hole five feet deep, and bury in it an earthern pot over which a granite post four feet high and six inches square is put. Six inches of it is left out of the ground. Within three feet of the monument are two more posts with arrow-heads on them pointing to the center of the monument. By these measures the central point is preserved beyond any chance of obliteration. Peculiar poles are used to be set over the monument, to assist the surveyors in locating the station from another point. On each post is a thin cone, to reflect the sunlight, which may be seen under favorable circumstances 40 miles. Where woods are too thick to be cut down, structures are built to elevate the signal above the trees. The process of measuring angles is most delicate, and in some cases have to be re-measured 300 times, the reason being that a line of light does not move in a straight line twice. To overcome this difficulty, an instrument called the heliotrope is used. By means of this instrument a ray of light can be flashed 50 or 60 miles. The instrument throws the light from a small mirror, and it appears to the spectator like a star. In general, observations must be taken in the early morning and late afternoons, on days when there is little refraction. Some days there is so much refraction that no observation can be made accurately. The instrument for measuring the angles measures to one-three hundred thousandth of an inch.

THE BLACK MILDEW OF WALLS.—Prof. Paley attributes the blackness of St. Paul's Church, London, mainly to the growth of a lichen, and Prof. Leidy recently stated to the Philadelphia Academy that his attention was called a few years ago to a similar black appearance on the brick walls and granite work of houses in narrow, shaded streets, especially in the vicinity of the Delaware river. Noticing a similar blackness on the bricks above the windows of a brewery, from which there was a constant escape of watery vapor, in a more central portion of the city, he was led to suspect it was of vegetable nature. On examination, the black mildew proved to be an alga, closely allied to what he supposed to be the *Protococcus viridis*, which gives the bright green color to the trunks of trees, fences and walls, mostly on the more shaded and northern side, everywhere in that neighborhood. Prof. Leidy thinks it may be the same plant in a different state, but until proved to be so, he proposes to distinguish it by the name of *Protococcus lugubris.* It consists of minute round or oval cells, isolated or in pairs, or in groups of four, the result of division; or it occurs in short irregular chains of four or more cells up to a dozen, occasionally with a lateral offset of two or more cells. The cells, by transmitted light, seem of a brownish or olive-brownish hue. In mass, the algæ appears to the naked eye as an intensely black powder.

PROPAGATION OF CODFISH.—The labors of the United States Fish Commission at Gloucester, Mass., is devoted to the hatching of cod. This is the most difficult of all, for the eggs have to float upon the surface until the hatching is completed. Something over 5,000,000 were successfully propagated last year. The fishermen there were very skeptical at first, and scoffed at the idea of men coming from Washington to teach them, who had been in the business all their lives and knew all about it. And they were very much pleased when the scientific men, battling against many odds, made a failure of the first attempt. Success, however, attended a second effort, and the fishermen were called in to see the result. Even then they could hardly believe it, and said that what was shown them was only a lot of pollywogs, which the commission had procured somewhere to fool them. They were, indeed, like pollywogs at first, but they flourished and soon took upon themselves the appearance of cod. The harbor is now full of the little three-inch-long cod, and last summer the fishermen were delighted to take visitors down to the dock and point out the little wigglers. The commissioners hope that these young cod, when they take to the sea, will, like salmon and shad, return to the place of their propagation to spawn, and the result of the experiment is awaited with much interest.

A PREHISTORIC WELL IN MAINE.—John Upham, of Camden, Me., had occasion to dig a ditch on his farm, sinking it between one and two feet deep. After proceeding some distance he encountered a rock-maple tree, over a foot in diameter, lying between one and two feet below the surface. Following this up he found it separating in two branches, one of which he cut off with an ax, and, removing the branch thus severed, discovered under it a well all stoned up, about three feet deep and about the same diameter. Contained within this enclosure was a boiling spring of excellent cool water, which has supplied the family since, never becoming dry in summer, nor freezing in winter. The wonder is, when and by whom was this well dug, and how long has the earth which was above it been swimming? It would seem to be too limited an estimate to calculate by a few hundreds of years, and not too great a stretch of credulity to look back some thousands of years for its origin.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Oct. 23.		Week Ending Oct. 29.		Week Ending Nov. 6.		Week Ending Nov. 13.	
Alpha	15¾	14¼	15	13¼	14½	14¼	14	13
Alta	6⅝	5⅞	5⅝	5	5⅝	5¼	5⅝	5
Andes	1.15	1	1.20	1.05	1.30	1.10	1.15	1.10
Alps	....	....	....	....	....	....	....	....
Argenta	1	80c	1	90c	1	90c	1	90c
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	....	....	....	....	....	....	....	....
Baltimore Con	....	....	....	....	....	....	....	....
Belcher	4	3¾	4.15	3.60	4¼	3.70	4	3.85
Belmont	1.30	80c	1	60c	90c	75c	1.05	75c
Best & Belcher	18¼	17¼	18¾	17	21⅝	18¼	21⅝	19⅜
Bullion	7½	7	7⅛	5⅝	7	6⅜	6⅝	6
Bechtel	1⅝	1¼	1.45	1¼	1.60	1.35	1.95	1½
Belle Isle	4½	4¼	4.90	4¼	4.85	3.95	6	4.10
Bodie	13⅝	12¼	14¼	13⅝	14	13¼	14¼	11⅞
Benton	4.10	3.15	3.70	3¼	3⅝	3.60	3.65	3½
Bulwer	11⅞	11¼	11⅞	11¼	11½	11	11½	11
Boyle	....	....	....	....	....	....	....	....
Black Hawk	80c	55c	80c	75c	75c	60c	70c	65c
Belvidere	75c	....	70c	50c	75c	65c	70c	65c
Booker	80c	65c	90c	70c	95c	70c	1.30	90c
Caledonia	2.65	2.30	2.35	2.10	2½	2¼	2.30	1.80
California	5⅝	5¼	5⅝	5	5½	5¼	5⅝	5¼
Challenge	2.20	2	3¼	2	3.20	2¼	2.60	2½
Chollar	7	6⅝	7¾	6½	6½	7¼	8⅞	8
Confidence	10	9	11½	9¼	11¼	10½	11½	10⅜
Con Imperial	1.15	1.05	1.10	1	1.10	1	1.05	90c
Con Virginia	5⅝	5¼	6⅜	5¼	5⅝	5⅜	5⅝	5¼
Crown Point	4.10	3.90	4¼	3½	4.15	3.90	3.90	3½
Con Washoe	....	....	....	....	....	....	....	....
Champion	25c	15c	25c	15c	20c	15c	20c	15c
Concordia	....	....	....	....	....	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	1¼	75c	85c	70c	1¼	75c	1½	1.05
Eureka Con	26½	24	29½	24½	27	25½	26½	25¼
Exchequer	5⅝	5	6	4.45	5½	4.85	4.90	4.60
Endowment	50c	40c	....	....	50c	....	90c	55c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	2⅜	2	2½	[illegible]	2.55	2	2½	2
Gila	30c	15c	20c	5c	35c	30c	50c	35c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	11⅞	....	12	11⅞	12	....	13	12¼
Goodshaw	40c	35c	50c	30c	35c	30c	50c	35c
Gould & Curry	10¼	9⅝	11¼	9½	11¼	10	11¼	10⅜
Hale & Norcross	14⅝	13¼	15½	13	18⅝	14⅞	20½	17⅞
Hillside	1.90	1.85	1.80	1.65	1.70	1.45	1¾	1½
Highhridge	....	....	....	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	15c	....	15c	....	10c	....	15c	10c
Independence	1.70	1¼	1.65	1.10	1.35	....	1½	1¼
Julia	3.95	3½	3.65	3.20	3⅜	3.30	3½	3.15
Justice	3.20	2.85	3.05	2.20	3	2.80	2.95	2.60
Jackson	4	3½	4½	4	4	....	4½	4
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	....	....	3	....	3½	3
Kentuck	4	3.95	4	....	4½	4	4.10	4
Kossuth	....	....	15c	....	15c	....	25c	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	80c	60c	75c	65c	70c	60c	55c	50c
Lady Wash	1.20	1	1.05	95c	1.15	1.05	1.10	1
Leopard	55c	50c	50c	....	65c	45c	50c	....
Leviathan	60c	50c	60c	50c	50c	....	60c	50c
Leeds	55c	50c	60c	50c	60c	50c	75c	60c
Lee	....	....	....	....	....	....	....	....
May Belle	25c	....	25c	....	35c	25c	35c	30c
Modoc	....	....	35c	10c	....	....	....	....
Manhattan	2⅜	....	2⅜	2½	2½	....	2.60	2½
Martin White	1⅞	1½	1.80	1⅝	1.65	1½	1½	1¼
McClinton	35c	....	50c	40c	40c	....	70c	40c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	36½	34	38	33	37⅞	33¼	34½	30¼
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	....	....
North Con Virginia	....	....	....	....	....	....	....	....
New York	60c	35c	40c	30c	40c	35c	35c	30c
Northern Belle	5⅝	4⅞	5⅝	6	5¼	5⅛	6	5½
New Coso	....	....	....	....	....	....	....	....
Navajo	50c	35c	50c	45c	60c	50c	75c	65c
Occidental	2½	2¼	2.40	2	2.45	2¼	2.30	2
Ophir	36	32	34½	30	33⅞	31¼	32	30¼
Oriental	40c	35c	50c	30c	40c	25c	20c	5c
Overman	9⅝	9	9½	8½	9½	9	9¼	8¼
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	....	....	3⅞	3¼
Phil Sheridan	60c	35c	50c	35c	50c	35c	35c	30c
Potosi	5⅝	5⅛	6	5	6¼	5½	5⅝	5¼
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	1¼	1.20	1¼	1.20	1½	1.40	1½	1¼
Richer	25c	....	25c	....	....	....	20c	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	13	11½	15½	12¼	17	14⅞	16⅞	15⅝
Seg Belcher	....	....	20c	....	20	....	....	....
Sierra Nevada	64½	56	61½	56	59	50¼	57	61⅞
Silver Hill	1.40	1.20	1¼	1.15	1.20	1.20	1½	95c
Silver King	6⅞	6	6⅞	6½	7	6⅞	6⅞	6¼
Silver Prize	....	....	....	....	....	....	....	....
Succor	25c	20c	30c	25c	35c	15c	30c	25c
Summit	1.55	1.40	1.85	1⅜	1.85	1¾	1.65	1½
Scorpion	5½	4¾	5½	4½	5	3.90	4¾	4.40
Solid Silver	25c	20c	5c	....	50c	5c	70c	25c
South Bodie	15c	....	25c	15c	15c	....	20c	....
South Standard	10c	....	....	....	....	....	....	....
Star	60c	55c	55c	50c	40c	....	40c	....
St. Louis	....	....	....	....	....	....	....	....
Syndicate	7	5⅞	6¾	6	6⅛	6	6	5
Tioga Con	3.60	3¼	3¾	3.40	3⅝	3¼	3.40	2.70
Tiptop	1.30	1.20	1.40	1.30	1.40	1.30	1.65	1.35
Trojan	20c	15c	15c	10c	15c	....	15c	10c
Union Con	76	69	90½	73	91½	81½	83	62½
Utah	25	21½	22¾	20	22	20	20⅞	18½
Vermont Con	....	....	....	....	....	....	....	....
Ward	2⅝	2½	2½	2.15	2½	2⅜	2.40	2.10
Wells-Fargo	20c	10c	15c	10c	10c	....	10c	5c
Woodville	30c	....	35c	25c	35c	....	25c	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	15¼	14½	17⅛	14	17	15⅝	16½	15

Sales at S. F. Stock Exchange.

Friday A. M., Nov. 7.
40 Alta...5⅝@5½
120 Bullion...6⅜
130 Belcher...3.95@3¾
165 Benton...3.65@3½
130 Best & Belcher..21½@21⅞
195 California...5½
600 C Dorado...3@3.15
250 Con Virginia...5⅝@5½
200 Chollar...8½
130 Caledonia...2¼@2.30
1710 Con Imperial...1.05@1
155 Crown Point...3½
90 Exchequer...4.90
455 Flowery...45c
1240 Golden Gate...2½@2.05
240 Gould & Curry...11
360 Hale & Nor...17⅞@18
185 Julia...3½
50 Justice...2.95
75 Kentuck...4.10
275 Lady Bryan...60c
100 Lady Wash...1.05
85 Mexican...33½@33¼
700 Mackey...20@15c
350 Mt View...3½@2.90
100 N Bonanza...1.15
200 New York...35c
20 Ophir...31⅞
50 Overman...9¼@9½
200 Phil Sheridan...35c
140 Potosi...5⅝@5½
300 Plutus...2½
165 Silver Hill...1.20
400 Succor...25c
170 Sierra Nevada...57@56¼
220 Savage...15⅝@15⅝
100 Scorpion...4⅞
1045 Union Con...83@82½
90 Utah...20⅞@20½
400 Wells Fargo...10@5c
100 Woodville...25c
260 Yellow Jacket...16¼@16

AFTERNOON SESSION.
850 Adenda...50c
400 Atlas...25@30c
1610 Argenta...95c@1
75 Boston...1.40
550 Booker...90@95c
150 Belvidere...70@65c
25 Bodie...14½
560 Bechtel...1.55@1½
1425 Belle Isle...4½@4.10
35 Belmont...75@80c
50 Champion...20c
85 C Pacific...7½
765 Caledonia (B H).2¼@2.20
225 Dudley...1.30@1½
50 D Standard...25c
1020 Day...1.05@1.10
870 Endowment...55@60c
620 Goodshaw...35@40c
10 Golden Terra...12½
160 Grand Prize...2.10
1150 Gila...50@45c
210 Jupiter...1.90@1.85
20 Jackson...4½
300 Leopard...50c
305 Mt Diablo...13½@14
1050 Metallic...1.40@1⅝
250 May Belle...35c
400 McClinton...40@45c
700 Martin White...1¼
210 Mammoth...7
120 Noonday...5@4.95
4225 N Belle Is...35c
670 Navajo...65@70c
150 N Noonday...4@3.90
150 Orient...35c
200 Oriental...20c
210 Paradise...95c@1
680 Queen Bee...45c
100 Real del Monte...5
220 Ray'd & Ely...1¼
225 S Bulwer...35c
105 Summit...1.60@1.65
185 Syndicate...5½@6
500 S Bodie...20c
1000 Silver King...6⅞@6½
250 Star...40c
300 Tuscarora...1
90 Tioga Con...3¼
170 Tiptop...1.40
200 University...25c
400 Vortex...45@50c
350 Wales...6¼@5¼

Saturday A. M., Nov. 8.
1100 Argenta...1
245 Alpha...14@13½
100 Andes...1.10
130 Alta...5¼@5⅝
100 Addenda...50c
1000 Altas...35@40c
540 Best & Belcher...21@20½
135 Belcher...3.95@3.85
110 Bullion...6½
530 Benton...3.60@3½
500 Belmont...85@90c
100 Bechtel...1½
220 Bodie...14
1210 Belle Isle...4.20@4½
75 Booker...90@95c
570 Chollar...8½@8¼
75 California...5⅜
330 Con Virginia...5½
175 Confidence...11½@10⅞
1300 Con Imperial...1
50 Crown Point...3.80
225 Caledonia...2¼
90 Challenge...2.60
400 Con Dorado...2.90
300 Champion...20c
950 Caledonia (B H).2¼@2.30
4020 Day...1.15@1¼
200 Dudley...1½
50 Exchequer...4.85@4.90
2700 Endowment...70c
1020 Flowery...45@50c
480 Gould & Curry...11@11½
990 Golden Gate...2.20@2.15
100 Gila...50c
1075 Goodshaw...40c
120 Grand Prize...2¼
650 H & Norcross...19@18⅝
110 Hillside...1¾@1½
20 Independence...1½
240 Justice...2.85@2.90
20 Julia...3.45
270 Jupiter...1.95@1
20 Kentuck...4
330 Lady Bryan...50@55c
20 Lady Wash...1.05
100 Leviathan...60c
720 Leopard...50c
265 Mexican...33@33¼
3200 Mackey...15@25c
200 Mount View...2.40@2.30
200 McClinton...45@40c
460 Mt Diablo...12@11½
600 May Belle...35c
125 Mammoth...7
20 Mono...7
1420 Metallic...1.10@1
140 N Bonanza...1.20@1.15
600 North Carson...10@15c
150 New York...30c
350 Northern Belle...5½@5⅞
3250 N Belle Is...35@40c
100 Navajo...65c
50 Noonday...4.95
75 Ophir...31⅞
40 Overman...9
120 Occidental...2¼@2.30
300 Oriental...20c
150 Orient...40c
250 Potosi...5⅜
200 Plutus...2.40
120 Paradise...95c@1
350 Queen Bee...50c
800 Raymond & Ely..1½@1.45
450 Real Del Monte...5⅛@6
775 Savage...16@16¼
290 Sierra Nevada...56@55⅞
500 Succor...25c
200 Silver Hill...1⅛@1.20
340 Scorpion...4.70
100 Solid Silver...30c
165 Syndicate...5⅞@6
250 Summit...1.60
600 S Bulwer...40c
800 Trojan...10@15c
200 Tuscarora...1
170 Tioga...3.40
300 Tiptop...1.35
505 Union Con...81@81½
950 University...20c
100 Vortex...50@60c
500 Wells-Fargo...10c
90 Ward...2.40
220 Yellow Jacket...15⅞@15½

Monday A. M., Nov. 10.
10 Alpha...13
290 Alta...5@5½
620 Andes...1.15@1.10
250 Belcher...3.95@4
855 Benton...3.65@3½
560 Best & Belcher...20½@21
75 Bullion...6
90 Confidence...10⅞@11
1260 Chollar...8½@8½
205 California...5⅝@5¼
155 Con Virginia...5⅝
850 Con Imperial...1
160 Crown Point...3.90
50 Challenge...2½
75 Caledonia...2.20
850 C Dorado...2⅜@2½
110 Exchequer...4.80@4.90
900 Flowery...50@60c
1260 Golden Gate...2½@2.35
480 Gould & Curry...11
1685 Hale & Nor...20½@19
305 Julia...3.30@3½
80 Justice...2.90
20 Kentuck...4
275 Lady Bryan...50@55c
250 Lady Wash...1@1.05
100 Leviathan...60c
250 Mt View...3@2⅞
545 Mexican...31@30½
3700 Mackey...20@15c
220 N Bonanza...1.15@1.20
400 New York...35c
50 Overman...8⅞
390 Ophir...30½@30¼
370 Potosi...5⅝
1000 Succor...25c
310 Silver Hill...1.20@1⅛
490 Sierra Nevada...53@51⅞
710 Scorpion...4½@4.40
1065 Savage...16⅞@16½
2050 Trojan...10c
155 Utah...19@18½
745 Union Con...70@72
500 Ward...2¼
540 Wells-Fargo...10c
260 Yellow Jacket...15⅞@15½

AFTERNOON SESSION.
1600 Argenta...1
800 Adenda...45c
100 Atlas...40c
1230 Belmont...95c@1
2310 Belle Isle...4½@4.40
140 Bodie...13½@13⅞
25 Bechtel...1½
100 Bulwer...11¼@11½
300 Black Hawk...65c
100 Boston...1.40@1.45
1485 Booker...1.15@1¼
800 Champion...20c
125 Caledonia (B H).3½@3.60
1340 Day...1.40@1½
100 Dudley...1¼
50 Defiance...50c
180 Eureka Con...25½
1300 Endowment...70c
250 Gila...45c
1300 Goodshaw...40@50c
10 Grand Prize...2
60 Golden Terra...13
200 Hussey...10c
85 Independence...1.45
20 Jackson...4
1130 Jupiter...2
100 K K Con...3
20 Leopard...50c
1000 May Belle...35c
120 M White...1½
500 McClinton...60@65c
775 Metallic...90c@1
985 Mt Diablo...12@11¼
345 Mono...6⅞@6½
125 Northern Belle...5⅞
1300 Navajo...60@70c
3700 N Belle Is...40@35c
125 N Noonday...3.95
130 Noonday...5
200 Oriental...15c
650 Orient...40c
280 Paradise...95c@1
500 Queen Bee...55@60c
540 Raymond & E...1.40@1½
200 Real del Monte...6@6¼
100 Richer...20c
700 Star...40c
260 Summit...1.60@1½
140 Syndicate...5⅞@5½
1100 S Bulwer...40@45c
100 Silver King...6½@6¼
100 Tuscarora...1
550 Tioga Con...3¼@3
1300 Tiptop...1.45@1.35
200 University...20c
150 Vortex...30@50c
75 Wales...5⅞

Tuesday A. M., Nov. 11.
310 Alta...5@5½
150 Andes...1.15
170 Alpha...13@13½
320 Belcher...3.90@4
75 Benton...3.60
75 Bullion...6½@6¼
210 Best & Belcher...20@20¼
555 California...5½@5¼
1400 Con Dorado...2¼@2
675 Caledonia...1.90@1.80
50 Challenge...2½
335 Con Imperial...95c@1
345 Crown Point..3.80@3.90
320 Con Virginia...5⅝@5½
685 Chollar...8
100 Confidence...11
200 Exchequer...4⅞@4.70
835 Flowery...60@65c
1440 Golden Gate...2⅜@2.35
495 Gould & Curry...10¼@10⅝
510 H & Norcross...18
310 Julia...3.20@3¼
310 Justice...2.60@2¾
130 Kentuck...4
1050 L Bryan...50c
355 Lady Wash...1@1.10
3460 Mackey...15c
250 Mt View...3@3.10
110 Mexican...30⅞@30½
335 New York...35@30c
355 N Bonanza...1.15@1.20
185 Ophir...30½@31
50 Occidental...2.20
45 Overman...8½@8¼
300 Plutus...2.40
245 Potosi...5½@5⅝
100 Phil Sheridan...30c
300 Silver Hill...95c@1
50 Solid Silver...25c
545 Savage...15⅞@16¼
600 Sierra Nevada...56@55
190 Scorpion...4½@4.60
600 Succor...25c
1400 Trojan...10c
110 Utah...19½@19¼
865 Union Con...65@62½
400 Wells-Fargo...10c
390 Yellow Jacket...15¼@15

AFTERNOON SESSION.
250 Argenta...90c@1
400 Addenda...50@55c
140 Atlas...35@30c
100 Black Hawk...70c
1330 Booker...1.30@1½
300 Boston...1½
150 Belmont...1@1.05
1215 Belle Isle...5½@6
470 Bodie...13@12
1410 Bechtel...1⅞@1.80
50 Belvidere...65c
290 Bulwer...11¼
150 C Pacific...7¼@7
200 Champion...20c
110 Caledonia (BH)...3½
650 Day...1.40
50 Dudley...1¼
1050 D Standard...20@30c
10 Eureka Con...26½
1300 Endowment...75@80c
210 Gila...35c
710 Grand Prize...2
125 Goodshaw...40@50c
80 Golden Terra...13
300 Independence...1.40@1¼
450 Jupiter...2¼@2.40
100 K K Con...3
50 Leeds...75c
50 Manhattan...2.60@2½
1050 Metallic...1@1.05
60 Mt Diablo...12½
380 McClinton...65c
1060 May Belle...30c
150 Mono...6¼@6½
150 Mammoth...6½
375 Martin White...1½@1.35
1100 Navajo...75@70c
240 Northern Belle...5⅞@6
1380 N Belle Is...65@55c
1000 N Noonday...3@3.10
1000 Noonday...4¾@3.80
200 Oriental...5c
100 Paradise...95c
100 Phenix...3½
400 Queen Bee...60c
100 Raymond & Ely...1½
500 Real del Monte...6½@6⅝
675 Star...40c
670 Syndicate...5½@5¼
120 Summit...1½
350 S Bulwer...40c
305 Tioga...3@2.70
2020 Tiptop...1.40
350 University...25@20c
65 Wales...6

Wed'sday A. M., Nov. 12.
160 Alpha...13½
160 Alta...5¼
505 Andes...1.15@1.10
585 Benton...3.60
130 Best & Belcher...20½
70 Bullion...6
310 Belcher...3.90@4
20 Confidence...10⅞@10⅜
100 California...5¼
375 Con Virginia...5⅝@5½
60 Challenge...2.60
300 Caledonia...1.90@1.95
250 Chollar...8½@8⅝
150 Con Imperial...95c
260 Crown Point...3.80@3.90
500 Con Dorado...2
270 Exchequer...4.70@4⅝
680 Flowery...60@55c
755 Golden Gate...2⅜@2½
170 Gould & Curry...10⅞@10⅝
520 Hale & Nor...19½@19⅝
255 Julia...3.20
180 Justice...2⅞
10 Kentuck...4
765 Lady Bryan...50c
250 Lady Wash...1.05
2150 Mackey...15@20c
560 Mt View...4@3⅝
870 Mexican...34½@34
35 New York...30c
230 North Carson...15c
370 N Bonanza...1¼@1.30
85 Overman...8½@8⅝
250 Ophir...32
125 Occidental...2.20@2
120 Potosi...5⅝
100 Plutus...2.20
400 Succor...25@30c
320 Silver Hill...1.10@1.05
215 Savage...16½@16⅝
520 Scorpion...4.60@4⅞
640 Sierra Nevada...56@55¼
100 Trojan...10c
750 Union Con...56@69½
45 Utah...19½@20
225 Ward...2¼@2.20
600 Wells-Fargo...10c
250 Yellow Jacket...15¼@15½

AFTERNOON SESSION.
250 Argenta...95c@1
600 Atlas...35@30c
700 Addenda...70@60c
1150 Booker...90c@1¼
415 Boston...1½@1.55
900 Belmont...1@1.05
580 Belle Isle...4½@4.20
1210 Bulwer...11@11¼
350 Bechtel...1⅞@1.95
555 Bodie...11⅞@12
150 Belvidere...65c
50 Caledonia (B H)...3
100 Champion...15c
100 C Pacific...7
2350 Day...1.30@1.40
375 Dudley...1@1¼
250 D Standard...25c
60 Eureka Con...26
120 Endowment...85@90c
210 Gila...35@40c
325 Goodshaw...40c
150 Golden Terra...12½
550 Hussey...10@15c
625 Hillside...1⅞@1.70
300 Hamburg...25c
100 Independence...1.45
770 Jupiter...2¼@2
50 K K Con...3½
100 Leeds...60c
800 Metallic...90@85c
50 Manhattan...2.60
50 Mammoth...6½
1000 Martin White...1½
70 Mt Diablo...13@12⅞
340 McClinton...70@65c
900 May Belle...30c
300 Mono...6½@6
350 Northern Belle...6
7630 N Belle Is...50@60c
1200 Navajo...60@45c
350 N Noonday...3½
100 Noonday...4.15
1425 Oriental...5c
200 Orient...35@30c
500 Phenix...3⅞
350 Paradise...1
400 Queen Bee...60c
900 Raymond & E...1½
195 Real del Monte...6⅝@6¼
350 Star...40c
50 Summit...1½
440 Syndicate...5
1250 S Bulwer...40@45c
310 Tioga Con...3
1205 Tiptop...1.45@1.65
200 University...15c
100 W Pacific...50c
100 Wales...6¼

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Argonaut M & M Co	California	2	10	Oct 7	Nov 15	Dec 8	J L Fields	240 Montgomery st
Bechtel Con M Co	California	3	15	Oct 1	Nov 5	Nov 25	W H Lent	309 Montgomery st
Champion M Co	California	4	20	Oct 15	Nov 20	Dec 9	Jno Crockett	203 Bush st
Defiance G M Co	California	4	30	Nov 12	Dec 17	Jan 6	W H Lent	309 Montgomery st
Gen'l Thomas M & M Co	Nevada	5	25	Nov 3	Dec 8	Dec 29	Wm Willis	309 Montgomery st
Gila S M Co	Nevada	5	25	Sept 30	Nov 3	Nov 24	W W Parrish	328 Montgomery st
Indian Queen M & M Co	Nevada	2	10	Nov 6	Dec 20	Jan 10	A K Durbrow	309 Montgomery st
Jupiter M Co	California	6	35	Nov 12	Dec 15	Jan 8	E C Masten	309 Montgomery st
K K Con M Co	Nevada	9	2 00	Oct 3	Nov 5	Dec 3	B B Minor	309 Montgomery st
Mexican G & S M Co	Nevada	9	2 00	Nov 7	Dec 11	Dec 31	C L McCoy	203 Bush st
Murchie G & S M Co	California	2	25	Oct 9	Nov 8	Dec 8	S D Rogers	328 Montgomery st
New York M Co	Nevada	20	30	Oct 22	Nov 24	Dec 16	D L Thomas	203 Bush st
Northern Belle Isle M Co	Nevada	1	10	Nov 8	Dec 11	Dec 31	E M Hall	327 Pine st
Oriental Con G & S M Co	California	5	25	Nov 8	Dec 10	Dec 27	H C Hinman	411 California st
Potosi M Co	Nevada	2	50	Nov 4	Dec 9	Dec 30	W E Dean	203 Bush st
Real Del Monte M Co	Nevada	8	1 00	Sept 18	Oct 20	Nov 29	O V Hubbard	203 Bush st
Rough & Ready Con G M Co	California	1	05	Oct 15	Nov 19	Dec 9	W H Lent	309 Montgomery st
Savage M Co	Nevada	39	1 00	Sept 22	Oct 31	Nov 20	E B Holmes	309 Montgomery st
Seg Belcher M Co	Nevada	16	3 00	Oct 31	Dec 5	Dec 26	Geo D Edwards	414 California st
Sierra Nevada S M Co	Nevada	60	2 00	Oct 31	Dec 4	Dec 24	W W Stetson	309 Montgomery st
Silver Hill M Co	Nevada	8	50	Oct 16	Nov 19	Dec 11	W E Dean	203 Bush st
Solid Silver G & S M Co	Nevada	2	25	Oct 6	Nov 10	Dec 8	J J Applegate	320 Sansome st
Utah S M Co	Nevada	27	2 00	Oct 22	Nov 25	Dec 13	G C Pratt	309 Montgomery st
Yellow Jacket S M Co	Nevada	24	1 00	Oct 13	Nov 18	Dec 18	Mercer Otey	Gold Hill, Nevada

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Hydraulic Grav M Co	California	1	20	Oct 2	Nov 10	Dec 13	James Ireland	216 Sansome st
Butte Hydraulic M Co	California	—	10 00	Oct 31	Dec 2	Dec 22	L L Dennery	220 Sansome st
Chollar M Co	Nevada	—	50	Nov 4	Dec 9	Dec 29	W E Dean	203 Bush st
Diana G & S M Co	Nevada	4	10	Sept 24	Nov 17	Dec 5	J T McGeoghan	318 Pine st
Florida Hill M Co	Idaho	1	10	Oct 31	Dec 5	Dec 30	R Wegener	414 California st
J & K G M Co	California	1	15	Sept 29	Nov 3	Nov 24	W H Lent	309 Montgomery st
Mammoth Grove M Co	California	1	02	Oct 9	Nov 13	Nov 29	A B Paul	328 Montgomery st
Mayflower G M Co	California	6	10	Oct 9	Nov 12	Dec 9	J Morizio	328 Montgomery st
McClinton M Co	California	4	25	Oct 10	Nov 14	Dec 4	W H Lent	309 Montgomery st
Meadow Valley M Co	Nevada	15	25	Sept 12	Nov 12	Dec 8	T W Colburn	414 California st
Mono and Cross Con M Co	California	1	10	Oct 8	Nov 12	Nov 29	J M Buffington	309 California st
Monte Cristo Con M Co	California	1	10	Oct 3	Nov 17	Dec 15	Butler Burris	309 Montgomery st
Noh Hill G & S M Co	California	1	15	Oct 6	Nov 10	Nov 28	J H Sayre	330 Pine st
Northern Light G & S M Co	Cal	5	10	Nov 5	Dec 8	Dec 26	F S Monroe	310 Pine st
North Scorpion M Co	Nevada	1	10	Aug 11	Nov 3	Nov 20	T B Ludlum	211 Sansome st
Numa M Co	Nevada	2	02	Oct 23	Nov 24	Dec 15	D Wilder	328 Montgomery st
Orion M Co	California	5	30	Oct 9	Nov 10	Nov 25	P Conklin	28 Sansome st
Quartz Mountain G M Co	California	7	50	Sept 20	Oct 27	Nov 17	E Hestres	729 Montgomery st
Rustler G M Co	California	2	10	Oct 21	Nov 24	Dec 12	A F Main	309 California st
San Xavier M & S Co	Arizona	1	25	Oct 14	Nov 17	Dec 8	F A McGee	32 Merchants' Ex
South Bulwer G M Co	California	5	25	Oct 27	Nov 29	Dec 20	W Stuart	320 Sansome st
Telfair M Co	Arizona	1	02	Nov 12	Dec 20	Jan 15	J Pentecost	702 Market st
Wide Awake P & M Co	Arizona	8	03	Oct 11	Nov 11	Dec 11	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Amazon Con M Co	Nevada	John Crockett	203 Bush st	Annual	Nov 25
Butte Creek Hydraulic M Co	California	R L Taylor	310 Pine st	Stockholders	Dec 1
Challenge Con M Co	California	W E Dean	203 Bush st	Annual	Nov 20
Curtis Con M Co	Nevada	H L Stone	419 Pine st	Stockholders	Nov 20
Godfrey Grav M Co	California	J M Buffington	309 California st	Annual	Dec 1
Hillside M & M Co	Nevada	F Frankenthal	330 Pine st	Annual	Nov 20
Harrington M Co	California	O C Miller	426 California st	Annual	Nov 18
Morisco M Co	—	O C Nidler	426 California st	Annual	Nov 20
Napa Con Q M Co	California	W W Parrish	328 Montgomery st	Annual	Nov 26
North Keystone M Co	Nevada	John Crockett	203 Bush st	Annual	Nov 18
Summit G M Co	California	W H Lent	309 Montgomery st	Annual	Nov 17

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Belle Isle M Co	Nevada	R H Brown	S F Stock Ex	75	Nov 5
Bodie Con M Co	California	W H Lent	Nevada Block	50	Nov 1
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	2 00	Oct 20
Pioneer M Co	California	J W Pew	310 Pine st	08	October 6
Standard Con M Co	California	Wm Willis	309 Montgomery st	50	Oct 13

SALES OF LAST WEEK AND THIS COMPARED

Thursd'y A. M., Nov. 6.
20 Alpha...14½
90 Alta...5⅝@5½
330 Andes...1.20@1.15
330 Belcher...3.85@3.90
690 B & Belcher...21@21⅜
235 Benton...3.65@3 70
530 Chollar...8½@8½
180 Con Imperial..1.05@1.10
130 Crown Point...4@3.95
225 California...5¼
310 Con Virginia...5⅜@5½
165 Confidence...11@11¼
80 Caledonia...2¼
100 Challenge...3
1650 C Dorado...3@3½
180 Exchequer...4.90@4.85
325 Flowery...45c
650 Fairfax...80c
290 Gould & Curry...11½@11⅞
960 Golden Gate...2
205 Hale & Nor...17½
20 Justice...2.90@2.95
435 Julia...3½@3.55
60 Kentuck...4.20
200 Kossuth...15c
100 Lady Bryan...60c
575 Lady Wash...1.05@1.10
140 Mexican...33½@33⅞
300 Mt View...3@3.30
520 Mackey...20c
375 New York...35c
200 North Carson...10c
195 N Bonanza...1.15@1.10
60 Ophir...32⅜
100 Overman...9½
160 Occidental...2.30@2.40
290 Potosi...5½@5⅝
470 Phil Sheridan...35@40c
30 Plutus...2½
180 Savage...15⅝@15⅝
85 Sierra Nevada...57@57½
300 Silver Hill...1¼@1.20
295 Scorpion...4.90@4⅞
600 Trojan...15c
60 Utah...20⅞@20½
655 Union...83½@82
600 Wells-Fargo...10c
530 Ward...2½@2.40
300 Yellow Jacket...16⅞@16¼

AFTERNOON SESSION.
200 Addenda...50c
1130 Argenta...95c
150 Booker...90c
25 Belvidere...70c
50 Bulwer...11½
10 Bodie...13⅞
1110 Belle Isle...4.15@4
550 Bechtel...1½@1.65
150 Belmont...80@75c
850 Champion...20@15c
275 Caledonia (B H)...1¾@2
75 C Pacific...7⅞@7¼
235 Day...1.15@1.20
50 D Standard...25c
200 Dudley...1.30
1600 Endowment...55c
105 Eureka Con...25⅞
210 Golden Terra...12@12½
100 Giant & O A...5
50 Grand Prize...2.20
240 Gila...40@50c
540 Goodshaw...35@40c
400 Hillside...1.30
250 Jupiter...1.90
60 K K Con...3⅞
550 Leopard...50c
375 Martin White .1.65@1.60
350 May Belle...30c
450 McClinton...40c
550 Mt Diablo...13@14
2060 Metallic...90c@1
120 Mono...7½@7
605 Noonday...5
870 Navajo...60@70c
575 N Noonday...4
2300 N Belle Is...35c
300 Orient...35c
1000 Oro...15c
100 Oriental...20c
750 Paradise...1
1000 Queen Bee...60c
690 Raymond & Ely...1.45
160 Real del Monte...4½
70 Syndicate...5⅞
500 S Bodie...20c
650 S Bulwer...40c
325 Summit...1.70@1.60
100 Star...35c
800 Tuscarora...1@1.10
200 Tioga Con...3.30
400 Tiptop...1.40
100 University...25c
35 Wales...6

Thursday A. M., Nov. 13.
60 Alpha...13¼
230 Alta...5⅜@5
220 Andes...1.10@1.15
35 Best & Belcher...19⅞
220 Bullion...6½@6
150 Belcher...3.85
100 Benton...3.60
120 California...5¼
20 Challenge...2.60
200 Chollar...8½
400 Con Virginia...5⅝@5½
125 Crown Point...3.80
250 Con Imperial...95@90c
90 Caledonia...1.90
935 C Dorado...2@2.10
195 Exchequer...4.60
170 Flowery...60@55c
75 Gould & Curry...10½
700 Golden Gate...2.45@2⅜
310 Hale & Nor...16¼@18⅜
430 Julia...3¼@3.15
500 Kossuth...25c
676 L Bryan...50c
620 Lady Wash...1.10
500 Leviathan...50c
135 Mexican...32
300 Mountain View...3.85@4
3050 Mackey...15@20c
250 New York...30@35c
450 N Bonanza...1.30@1¼
320 Occidental...2.20
205 Ophir...31@30⅞
150 Overman...8½@9
350 Original Keystone...3½
100 Phil Sheridan...30c
45 Potosi...5¼@5½
300 Plutus...2.30
550 Succor...30c
80 Savage...15½@15⅝
225 Sierra Nevada...53@54¼
135 Silver Hill...1.10@1
190 Scorpion...4.60@4½
85 Utah...19
300 Union Con...65½@66½
220 Ward...2¼@2.10
4300 Wells-Fargo...5c
400 Yellow Jacket...16¼@16½

AFTERNOON SESSION.
1300 Argenta...95c@1
1050 Adenda...70@65c
550 Atlas...30c
875 Belmont...95c@1
375 Belle Isle...4.65@4½
1100 Boston...1.60@1.65
50 Black Hawk...70c
1100 Booker...1
300 Belvidere...75@70c
605 Bodie...12⅝@12⅞
495 Bechtel...1.90@2
260 Bulwer...11
350 Champion...15@20c
150 Caledonia (B H)...3.40
100 Con Pacific...7
350 Dudley...1
1000 Day...1.40@1.35
50 D Standard...30c
135 Eureka Con...25¼@25⅞
1250 Endowment...90c
40 Golden Terra...12½
200 Gila...35c
820 Goodshaw...40c
110 Grand Prizo...2.15@2¼
220 Hillside...1⅞@1.70
150 Hussey...15c
1156 Independence...1¼
295 Jupiter...1 90@2
175 K K Con...3¼
125 Leeds...60c
300 M White...1¼
95 Mono...6
200 May Belle...30@35c
100 Metallic...95c
200 Mt Diablo...12½
250 McClinton...65@70c
40 Noonday...4.60
2225 N Belle Is...55@50c
150 N Noonday...3½
130 Northern Belle...6
180 Navajo...50@60c
250 Orient...30c
1080 Oriental...10c
250 Paradise...1
235 Queen Bee...50c
235 Real del Monte...6
120 Raymond & E...1.40
1000 S Bulwer...40c
220 Summit...1½@1.60
200 Syndicate...5½@5¼
1400 Tiptop...1⅜@2
120 Tioga Con...3@2.90
40 Wales...6
100 W Pacific...50c

Pacific Board—Latest Sales.

Wed'sday A. M., Nov. 12.
10 Andes...1.10
50 Benton...3.60
130 Best & Belcher...20½@20⅞
70 Challenge...2⅝
100 California...5⅝
200 Con Imperial...95@80c
50 Caledonia...1 95
10 Crown Point...3.85
775 Colorado...3¼@4
280 Exchequer...4.65
100 Endowment...80c
120 Gould & Curry...10⅞@10½
385 Hale & Nor...19⅞@19⅝
50 Justice...2.80
10 Lady Wash...1
130 Mexican...34½@34⅝
80 Ophir...32¼@32
70 Potosi...5½
90 S Nevada...57@56¼
255 Savage...16½@16⅝
[illegible]30 Union...69@68½
10 Yellow Jacket...15½

AFTERNOON SESSION.
20 Bullion...6.15
90 Best & Belcher...20@20½
200 C P Ravine...25c
20 Chollar...8¼
250 Endowment...85c
50 Gould & Curry...10½@10⅝
40 Hale & Nor...18⅞
200 Mackey...17c
100 M White...1¼
10 Mexican...33⅞
70 New York...30c
300 Oro...1⅜@1.30
10 Ophir...32
50 Sierra Nevada...55½@55⅜
60 Savage...16½@16⅝
100 Trojan...9c
100 Uncle Sam...2.40
20 Union...67½@68
200 Wells-Fargo...6c
10 Yellow Jacket...15½

California Board—Latest Sales.

Wed'sday A. M., Nov. 12.
1300 Ætna...1@2c
50 Alpha...13@13½
50 Andes...1.10
1500 Atlanta...1c
1050 Atlas...40@42c
70 Best & Belcher...21@20⅞
1500 Black Hawk...60@70c
110 Bullion...6@6½
3100 Coso Con...5@4c
70 Caledonia...1.80@1.85
50 Challenge...2¼@2.45
300 Con Imperial...95@92½c
90 Crown Point...3.90@3.85
100 Endowment...85c
45 Gould & Curry...10⅜@10½
90 Hale & Nor...19½@19½
650 Kossuth...15c
150 L Wash...1.05@1
200 Mint...14c
400 N Sierra Nevada...9@10c
100 New York...30c
70 Ophir...32@34⅜
90 Potosi...5⅝@5½
40 Savage...16½
90 Sierra Nevada...56½@56¼
250 Silver Hill...1.05
150 Yellow Jacket..15¼@15⅝

AFTERNOON SESSION.
50 Alpha...13@13½
60 Alta...5⅜@5¼
100 Almaden Q...85c
2775 Atlas...43@30c
100 Andes...1½
100 Argenta...1
30 Belcher...3.90
40 Best & Belcher...19⅞
40 Bullion...6½@6¼
150 Benton...3⅝
1150 Black Hawk...65@50c
90 California...5¼@5⅜
65 Con Virginia...5⅜
200 Con Imperial...95
25 Crown Point...3.
20 Chollar...
30 Challenge...2.
40 Caledonia...1.
40 Exchequer...
150 Enterprise...

20 Gould & Curry	10¢	30 Ophir	31¢@31¢
100 Golden Chariot	6c	40 Potosi	5¢
30 Hale & Nor.	19¢@18¢	60 Sierra Nevada	56¢@56¢
110 Lady Wash.	1¢@1.05	40 Savage	16¢
20 Mexican	34	500 Senator	12½c
1100 N Sierra Nevada	1c	100 Trojan	10c
100 Navajo	70c	10 Union Con.	69
900 Newark	4¢@1c	10 Yellow Jacket	15¢

Mining Share Market.

There has not been any change in the market that would indicate a permanent revival of business. The reported rich strike in Hale & Norcross had no greater continuous effect. The fluctuations for the week might bo aptly illustrated by the diagram of a fine-tooth saw, winding up by a general tumble. It appears that very little business is now done without quite large advances on a margin, so that whatever transactions have occurred have been either of small amounts or through large manipulators for a purpose. Whether tho new mining stock boards of New York and Chicago have any effect on our markets here may not be certain. It appears that the latter are affected by a general dullness in the business. New York complains that its brokers find it difficult to transact business in miniug stocks at 5% deposited on margins; we should say so. The fact, however, that even when speculation can be indulged in by nearly everybody at that low figure, there is no satisfactory feeling in the market, shows that there is something "rotten in Denmark," and that possibly tho business will not revive until people generally accumulate enough surplus money to throw away in speculation.

Life-Saving Respirator.

In view of the manifest injury to the human lungs caused by the inhalation of poisonous particles through the respiratory organs, in the various trades and occupations where chemicals and metallic dust are handled and produced, we again call attention to the "life-saving respirator," for which Seth Marshall, Jr., is the agent, at 309 California street, San Francisco.

In respiring, the air is inhaled through a wet sponge or cotton, and in expiring passes out through a valve at the side, so that breathing with the respirator is easy, allowing it to be worn constantly and without the least inconvenience. Being manufactured of the best white rubber, they will last a lifetime. Numerous testimonials sent Mr. Marshall unsolicited, testify to the worth of this respirator. Edward W. Burnham, Supt. of the Pioneer White Lead Works; J. B. Randol, manager of the Quicksilver mining company, of New Almaden, Cal.; S. P. Ely, for the Ely mill, Utah, and many others value it so highly as to use it in large numbers. It may really be regarded as a benefit to humanity. We refer to the advertisement and illustration in another column.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Mammoth, Oct. 31st, $19,010.49; Hillside, Nov. 7th, $5,000; Martin White, Nov. 4th, $8,349.88; Gila, Nov. 8th, $2,137; California, Nov. 5th, $54,270.82; Northern Belle, Nov. 5th, $7,355.21; Hillside, Nov. 10th, $4,000; Ophir, Nov. 8th, $40,016.59; Belle Isle, Nov. 10th, $14,000; Tiger, Nov. 8th, $20,000; Vulcan, Nov. 10th, $3,640; Bodie Con., Nov. 10th, $10,000; Hillside, Nov. 12th, $4,000.

NEVADA BORAX.—In our issue of Oct. 25th, we published an item concerning the use of "Borax for salting Butter." The article recommended the use of borax for that purpose, and the hope was expressed that its preservative qualities might create a demand which would aid in the development of the borax industries of Nevada. We have received a communication on the subject from Messrs. Smith Bros., of Peel's Marsh (Marietta, Esmeralda county), Nevada, which says that borax has sustained a great depression in price for the last seven years, owing to the embarrassed condition of the iron and pottery interests in England, whence comes the principal demand, in consequence, whereof, nearly all of the American producers have succumbed to the low prices, Messrs. Smith Bros. being the only producers now in Nevada. These gentleman say they have been long and earnest advocates of the antiseptic and preservative properties of this simple and harmless salt, and believe that on account of its virtues it is beginning to meet with a more general recognition in the household economy. As a significant fact the writers have recently sold and shipped to a large meat-packing firm of Chicago 20,000 pounds of pulverized borax, which it is understood is to be used in packing and canning corned beef. With reference to other matters in the communication we will say that we are always glad to publish whatever will be of benefit to our growing industries on the Pacific slope. It is indeed one of our aims to increase them by every means in our power.

THE Central Pacific Railroad Company has commenced suit against the city of Oakland, to quiet title to about 500 acres of land lying along the water front of that city.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

GOVER.—*Ledger*, Nov. 8: Tuesday as the miners were drifting north in the 700 tunnel in direction of the North Gover, they struck a body of ore which is estimated to be about six ft wide. Just before going to their dinner at noon they let off a blast. On descending to work again the miners were surprised to hear a rush of water from the direction of the drift, and on investigation they were greeted with a large volume of water coming out of the crevice caused by the blast. This trouble has caused the miners to quit work, and at present they are idle, as it requires the hoisting of the water day and night. Mr. Palmer, the Superintendent, has gone to San Francisco to make arrangements for erecting a pump.

MISCELLANEOUS.—Neville's hydraulic claim, at Red hill, near Butte City, is in full blast. Four men are employed upon it. The pipe for this claim is one and one-fourth miles in length. Grading operations on the Coney mill site were started Wednesday morning. Ten or twelve men are at work.

BUTTE.

SAM DAVIS MINE.—*Mercury*, Nov. 7: Mr. Guldery, from Forbestown, reports the outlook for the property as all that he and his partners have anticipated. They have opened a ditch two miles long, capable of carrying 1,500 inches of water. At present the force is engaged in making a 60-foot cut through the bedrock. The latter has a 15-foot face. The cut will be completed next week, after which washing will be commenced. It is calculated that the first week's run will yield at least 200 ounces. Buck Lamb is Superintendent of the mine.

CALAVERAS.

EVANS LEAD.—Angels *Echo*, Nov. 4: The claim known as the Evans lead, which is located about five or six miles from Murphy's and about one mile from the Stanislaus river, so called because it is owned by Gen. Evans & Co., is now being vigorously worked. The company have erected a small mill, which consists of one arastra and two stamps, and which is only intended for prospecting purposes. The wheel, if we recollect rightly, is 24 ft in diameter, which, with 40 or 50 inches of water, would have power to drive 10 stamps if necessary. The arastra is 10 ft in diameter, and will reduce from 1,500 to 2,000 pounds of rock per day, which will pay a fraction over $10 per ton. We hear that Gen. Evans & Co., intend adding 10 stamps to their battery which will crush at least 15 tons in 24 hours, and which at $10 per ton would yield the sum of $150 per day.

ITEMS.—Quite a rich strike was made in the McElroy claim near Altaville, last week, which, it will be remembered, is gravel diggings. A number of beautiful specimens taken from the above claim were exhibited at Nunninger's saloon the other day, none of which weighed less than $1.50 and some of them much more. The gravel pays $2.50 per carload. The Collier mine, which is located five miles east of Murphy's, is paying well at present, and bids fair to be one of the richest claims in the mountains.

MARIN.

SAN GERONIMO MINE.—*Journal*, Nov. 0: Last week the drifters in this mine crossed a vein of green rock, having a marked ruby tint, which is an almost infallible sign that a body of rich ore is near. This rock assays $32 to the ton. The rock passed through during the last three weeks or so is uniformly good, and assays from any of it are more than satisfactory. The highest return obtained from assay was $51, and the average from the outcroppings down, before any of the best rock was found, was $7 or $8 to the ton.

MONO.

TRUE BLUE.—Mammoth City *Herald*, Nov. 5: The ground is working well, running through occasional streaks of fine-looking quartz; all indications showing a near approach to the ledge. This ledge, on the surface, showed richer assays than any other in the district.

MAMMOTH.—The huge engine and the 40 stamps are kept constantly moving day and night. At the foot of the main tramway coming down the hill the carpenters are fast bringing to completion the connection between that portion of the works and the covered tramway leading to the mill. The roadways leading from the mouths of the several tunnels are being put under cover. The usual amount of ore is being taken out of the mine and put through the mill. The air compressor and Burleigh drills are constantly in motion.

RICH ROCK.—A late number of the Bodie *News* says: We have been shown some specimens of rich rock from the 460 level of the Addenda mine. It is of a very peculiar character for this camp, bearing more resemblance to the Comstock ores than those of Bodie. The specimens shown were heavy, dark sulphurets, carrying considerable iron. Assays from this ore run as high as $1,000, in about equal proportions of gold and silver.

SYNDICATE.—Bodie *News*, Nov. 9: Drift on Taylor vein has been extended 12 ft; total length, 100 ft. No drifting south this week, the men being employed in opening out the stopes. The upraise has been extended 18 ft, making a total length of 50 ft from the track floor. The upraise carries a good solid ledge, fully 2½ ft wide, of high-grade ore. South drift on Colcord vein has been extended 12 ft; total length, 118 ft. In the upraise 14 ft was made, making a total of 42 ft. The stopes on this and Taylor ledges are getting well opened, and 40 tons of ore are extracted daily without trouble. The Isabella drift has been extended 25 ft; total length, 235 ft. The ledge in this drift has widened to about 20 inches, and the ore is of good quality. The whole face of the drift is now in a mixture of soft porphyry and quartz. The mill is crushing about 36 tons of ore per day, which returns about $35 per ton.

NOONDAY.—The drift on the vein from north drift, 212 level, was driven 32 ft during the week. The vein is six ft wide of very fine ore. The upraise started from first crosscut north, 212 level, is 32 ft up; vein 8 ft wide, and looking splendidly.* On the 312 level, vein No. 1, drift north, has been advanced 27 ft; total length, 152 ft. The vein at this point is small, but well defined. Drift south, on same vein, is 120 ft in, but dips so flat east that the drift cuts but a small portion of it. Vein No. 2, drift same level, is in 84 ft south and 63 ft north. At the end of the drift north, the vein is seven ft wide of good ore. End of drift south, vein fully five ft wide, same character as last reported. Six hundred tons of ore on the dump, and 30 tons is being extracted daily. Another boiler for the pump engine has been shipped from San Francisco, and will be here in a few days.

CEN. PACIFIC.—The main shaft is now down 22 ft below the 400 station, and is being sunk at the rate of 2 ft per day. In the bottom of the shaft the rock is of porphyritic formation, heavily charged with iron pyrites, and indicates the near proximity of a large ore vein discovered 10 ft east of the shaft when cutting out the 400 station. This vein is pitching slightly to the west, which will carry it into the shaft before the 500 station is reached, and is 6 ft 3 inches from wall to wall, divided by a porphyry horse 2½ ft thick, leaving 3½ ft of quartz, resembling in appearance that found in the Standard. The east wall rock is composed of very hard black porphyry, while the west wall is softer, thoroughly mineralized and stratified with the vein. Drifting north there is every indication of soon striking higher grade ore.

MARYLAND CON.—The vertical shaft has been deepened 14 ft since last report. Two sets of square timbers have been put in during the past week. The ground passed through is of still more favorable character. Seams of clay and strata of quartz are continually cut, which with the increasing softness of the ground encountered encourages the belief that the ledge is not far distant.

UNIVERSITY.—Shaft now down a depth of 138 ft, having made 14 ft during the week past. At the bottom the work is going on in remarkably hard rock, which makes progress slow. Occasional seams of quartz are encountered in the rock passed through, and everything looks favorable for a ledge to be found shortly. Machinery and all about the mine working well.

MONO.—East crosscut from the 400-ft station is in 534 ft, face in hard, blue porphyry. The north drift from the east crosscut, same level, is in 200 ft. The ledge shows good ore, the face is in fair working ground. The pump has not yet arrived, but the pipes are nearly all in and everything is in readiness to place it in position as soon as it arrives.

BODIE.—The past week has been characterized by no new developments of importance. The ore output is about the same as usual. In the main incline the ore body maintains its size and richness. The ledge is looking well in the stopes, which produce the regular amount of ore. Work is progressing favorably in all parts of the mine.

BOSTON CON. AND LAST CHANCE.—The combination shaft is now down 132 ft. The ledge continues to the east of the incline. When a depth of 200 ft has been reached, a crosscut will be run to cut it. The incline still in good working ground.

QUEEN BEE.—Still sinking the main shaft, which has now reached a depth of 360 ft; progress for the week, 29 ft. Ground works well and still carries the ledge spoken of in last report. It improves with depth.

BOOKER.—During the past week the shaft has reached a depth of 490 ft. The rock in the bottom works fairly, and the water does not materially retard operations.

NAPA.

COAL DISCOVERY.—We learn from a recent Napa *Reporter* that a coal vein has been discovered in Wooden valley, from which several sacks have been taken by the owner. It is said to be of good quality, burns freely.

NEVADA.

DRAIN DRIFT CONNECTION.—Grass Valley *Union*, Nov. 7: Yesterday a connection was made between the two headers of the drain drift that has been in process of construction for some months between the new Rocky Bar and New York Hill mines. The drift has been run from each mine, and work has been prosecuted night and day, and rapid progress made. The only thing remaining to be done now, in order to drain all the water from the lowest workings of the Rocky Bar, through the drift to the bed of Wolf creek, is to lay a line of pipe about 800 ft in length. By means of this drain the Rocky Bar will be relieved from all pumping to the lowest present depth of the incline, 370 ft, or about 175 ft perpendicular.

THE DOORYARD MINE.—*Transcript*, Nov. 7: It will be remembered that a few weeks since W. T. Joyce started a tunnel under the roadway from the front part of the houseyard on Water street (Nevada City), in hopes of finding the quartz ledge that is known to extend from near Coe's shoe store to the east end of town. He has now reached a point in the hill 65 ft north of the mouth. Day before yesterday a stringer of fine-looking ore, that shows considerable sulphurets and gold, was developed, and Mr. Joyce is timbering up the drift wherever there is any liability of a cave. He thinks the main ledge is not far from the breast, and will in the spring prospect thoroughly for it.

THE JULIA MINE.—Messrs. Sloan & Dunn, who have located a claim on Deer creek, just east of the Merrifield, as recently mentioned in these columns, have sunk an additional 15 ft in the incline since last report, making it 40 ft deep, and are now preparing to put in timbers. The ledge shows strong, and the three tons of ore already taken out contain considerable free gold. It is the intention of the owners to put the shaft down to a sufficient depth to prove as to whether or not the strike is a permanent one. If their efforts result favorably, a tunnel will be run from the creek to work it. It is estimated that the tunnel will tap the ledge within from 110 to 120 ft from the mouth, and give 160 ft of backs, which can be considerably increased by running along the lead.

IDAHO.—Grass Valley *Union*, Nov. 11: Sinking the main shaft is prosecuted diligently, and is now 20 ft below the No. 11 level. The ledge in this level, as well as in the shaft below, is large, averaging about four ft. The rock is low grade, but works to a moderate profit. The drifts above, up to No. 7 are also (being driven eastward. The ledge in No. 7, which a month ago had diminished in size, has been growing stronger. The 8th and 9th levels are producing good ore; No. 10 is not looking so well, owing to encountering softer ground, but an improvement is looked for when the drift is carried further into the east country. The mill is using 35 stamps constantly. The regular monthly dividend was declared on the 3d inst. of $2 per share, amounting to $6,200. This is the 123d regular monthly dividend.

ALPHA.—The claim of this company is on the north side of Wolf creek, running parallel to and distant from the Idaho about 800 ft. The claim has been worked for the past five or six years, by sinking a number of shafts along the line of the ledge to various depths, or as far as could be gone without steam power. The quartz has always paid well, the average being $17 per load.

NEW YORK HILL.—No. 10 drift (1050 ft) has been run 90 ft south, and is found to carry a good sized ledge of milling fine rock. This drift is being extended to catch the pay chute, which is found going down in the 8th level in that part of the mine, and it will undoubtedly be found on the No. 10 when the drift is extended between 400 and 500 ft. No. 9 drift, north, is in a distance of 400 ft, in fair milling rock. The work of sinking the main incline is going on constantly, and is down 60 ft below No. 10 level, in easy sinking ground.

WASHINGTON.—The ledge in the shaft is producing fine looking, lively quartz, carrying a large amount of sulphurets. The ledge varies from 12 to 20 inches, and the walls, which are well defined, are from 2 to 3 ft apart, which gives indication that the ledge will be a strong one when further depth is attained. The Washington hoisting works are run by water power from the Idaho ditch, and the rig is one of the best in the district, being substantial, simple and efficient, and run at a very small expense. The power is sufficient to sink the shaft 600 ft.

GODFREY GRAVEL.—The tunnel which was started some months ago, on Weed's ranch, has penetrated the hill a distance of 130 ft—the gravel having been struck at 100 ft. The gravel prospects well, and is a portion of the lead which the company have been working through their shaft on Alta hill. On account of finding the lead in the tunnel the old shaft and hoisting works on Alta hill will be abandoned, and the Hope battery of 8 stamps removed from its present location to the mouth of the new tunnel.

NONESUCH.—This is a recent location, made by C. W. Smith and Milton Green, 6 miles southeast of Grass Valley, near Morrison's station, upon which they have sunk a prospect shaft 10 ft. The ledge is 2 ft in width, heavy sulphureted, and shows largely in galena. The rock assays both in silver and gold, the former mineral predominating. The rock is peculiar in appearance, and not at all characteristic of that found in the immediate vicinity of Grass Valley. The region in which it is found has not heretofore been prospected to any extent for quartz.

KING'S HILL.—Work was recently started up on this mine by new lessees, M. Gallagher & Co., who have started a new level at the depth of 220 ft, running both north and south from the shaft. The ledge is found from 12 to 20 inches in size, and of good milling quality. A number of loads of quartz are on the dump, from which a crushing will soon be made.

EMPIRE.—Work is now going on regularly at the Empire since the new hoisting works and shaft on the Rich Hill ledge have been ready for service. During last month 300 loads of quartz were raised through the new shaft.

CENTENNIAL.—No. 3 level south is producing fine milling ore, which it is estimated will run to $60 to $70 per load. A large crushing is accumulating at the Orleans mill, upon which work will be commenced in a few days.

PLACER.

ITEMS.—*Herald*, Nov. 8: The Hermit tunnel that starts in from the El Dorado canyon side, above Michigan Bluff, is being pushed ahead. The Swiftsure keeps a small force at work still prospecting the claim. The Hidden Treasure, the boss drift mine of the State, is now working about 60 men, and the ground gets gradually better. The Dam claim, two and one-half miles above the Treasure, is also beginning to rank among the good paying mines. They are now working some 10 men and securing highly satisfactory results. At the Rainbow, half a mile above the Dam, a new boarding house has been erected, to be run by Mr. Page and his wife, and everything about the mine is being placed in shape for active operations. This claim yielded remarkably well when worked before, and we may expect some more big clean-ups as soon as they have sufficient water to wash their dirt. A. Brsece passed through Auburn the other day with some remarkably fine specimens taken from the drift in his and Wheeler's mine at Bath. Since the water season closed they have been drifting in their mine, and find it pays remarkably well.

PLUMAS.

THE BIG SHAFT.—*National*, Nov. 8: One of the most extensive prospecting operations in the county is going on at Jamison, in the shape of an immense shaft which is being sunk in the bed of the creek to bottom the large blue gravel channel which is known to exist there. The shaft is already down some 200 ft, but the machinery proving inadequate, work in the bottom has been suspended and new machinery is being put up, and on a gigantic scale. A 40-ft overshot wheel will furnish the hoisting and pumping power, and it is thought that when ready to start up again that there will be no trouble in working it. The pump is 10 inches in the clear, and will handle an immense body of water. The owners of the mine are reticent regarding developments already made, but the impression is that they have had some flattering indications to warrant the outlay which they are making. We hope they will be successful, as that would demonstrate the wealth of the blue gravel channel, which certainly extends down the Middle Fork to Nelson, and probably lies under the mountain south of this valley. If it is rich, there is room in it for hundreds of men.

SPANISH PEAK.—Mr. Atwood, of Chicago, arrived from Reno on Wednesday, to start up work on the Spanish Peak gravel mine. Mr. John Tucker has been appointed Superintendent, and under his competent management prospecting tunnels will be run, and the country in that neighborhood thoroughly developed.

SHASTA.

ITEM.—The Shasta *Courier* of late date says: Two assays of quartz taken from one of the ledges on W. L. Carter's place adjoining town, show $38 gold and $1.25 silver, and $50 gold. During the past few years several assays have been made from quartz taken from this ledge and all indicated that the rock would pay well for working.

SIERRA.

KENTON MINE.—The Nevada City *Transcript* of the 11th inst. mentions some marvelously rich ore which was recently struck in the Kenton mine at Allegbany, Sierra county, and 1,000 pounds of it has been brought to this city for reduction. It is very heavy in arsenical pyrites, but shows no free gold. Assays made at J. J. Ott's establishment show that it contains over $21,000 worth of gold per ton. Mr. Ott, who is one of the most reliable and experienced assayers in the State, says it is the richest ore he ever handled.

SONOMA.

DRY CREEK.—Healdsburg *Enterprise*, Nov. 6: J. L. Jordon, R. S. Owens and Lewis Burnett, of Santa Rosa, are making preparations to mine for gold this winter. They prospected here last summer, and, finding promising indications, have selected a branch of Dutcher creek, flowing through J. S. Bell's place, near the Blair house, as the center of their operations. They will put down 10 sluice boxes with riffles, and collect the gold with quicksilver. The water will be conducted through a ditch from Dutcher creek. The gold found is known as "gravel gold," and is similar to that found in the Sierra mountains in the top gravel. No bedrock has been discovered as yet. Mr. Jordon is an old miner and thinks fair wages can be made. The mining camp has been named "Bell's Ravine." S. Wilsey, H. Patten and others have taken gold out of the same branch. Practical miners say this canyon is an old river bed; if so, gold may be found in paying quantities.

TUOLUMNE.

FERGUSON MINE.—*Independent*, Nov. 8: Another important development has recently been made in this well-known mine. An excellent chute of ore was discovered in the main tunnel, 1,400 ft from the entrance, and to intercept this body of ore in depth, the 200 level was being run. It has been struck sooner than was anticipated, showing that this chute, like others in the mine, lengthens as it descends. It has also increased in width, from 18 inches in the main level to four ft in the 200 level, and the quality has also improved. It is fully speckled with gold, and in a box full brought to the surface by Mr. Francis, every piece showed gold. The large body of ore in the south part of the mine is also opening out most satisfactorily, and the continued success of the mine, for a long time to come, is assured.

MONT JEFFERSON.—A writer in the *Independent*, speaking of this mine, which is located in the Groveland country, says: Entering by the main shaft we descended by a ladder to the 80 level; thence along the level in a western direction some distance, to where the drift widens out and exhibits a large vein of ore, not less than 10 ft thick, about one-half of which is pure ore, and the balance mixed with alternate layers of slate. The ore at this place is thoroughly oxidized and shows very little sulphurets, but yields about $9 per ton free gold at the mill. From this point we descended in an easterly direction along the edge of a stope, the ore body remaining about the same thickness as above, to a point known by miners as the water level, where the oxidized ore changed to bright sulphuret ore, and will yield about 15% clear sulphurets, which will pay by chlorination from $60 to $90 per ton. Below this point the vein fairly glitters with sulphurets, and continues about the same thickness, until just before we reach the 165 level, where it narrows down to about four ft, the quality of the ore still about as above. The main drift or level at this place is blocked up with beautiful, bright ore from above ready for hoisting, which prevents us from going further west, so we follow the drift east to the main shaft. Passing which, we continue east along the same level (105) until we reach another large vein or body of bright sulphuret ore; but here there has been a cave, and timbers stop our further progress in this direction. This is very dangerous ground to work, but the foreman tells me that there is ore enough here to keep the mill going one year at least. Near this place is a crosscut which runs in a southerly direction toward the footwall, and passes through a body of slate or horse 22 ft thick and strikes the footwall vein near the bottom of the old Burns shaft. Here they have a vein not less than 14 ft thick, full six ft of which is pure and beautiful sulphuret ore; the balance mixed with slate, as above. Very little of this ore has been removed, and there is no telling what the amount may be.

NEVADA.

WASHOE DISTRICT.

OPHIR.—Gold Hill *News*, Nov. 12: The main incline has now attained a depth of 128 ft, on the slope, below the 2400 station, and the bottom is still in favorable-looking vein porphyry, carrying stringers of quartz. On the 2400 level the face of the west crosscut is 128 ft from the east side of the incline, and is passing through a fine vein material carrying quartz and clay. The west crosscut, 2300 level, joint with Mexican, has just struck a new formation of favorable-looking vein material, carrying low-grade ore.

HALE & NORCROSS.—The Gold Hill *News* of last Saturday contained news of a strike in the crosscut on the 2100 level. The location of the strike is 500 ft south of the Savage shaft, 36 ft south of the Hale & Norcross shaft, and 250 ft from the Chollar line. Assays as follows: The first, of rock taken out on Saturday, gives in gold $54.13, in silver $104.20; total, $218.33. The other, of rock taken out on Sunday, gives in gold $123.60, in silver $343; total, $471.60. A reporter in the above paper interviewed Mr.

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Experimental Geology.*

It has been objected to geology as a science that its conclusions were frequently hassd upon insufficient premises, and that it was lacking in actual demonstration. Indeed, a writer of eminence once described geologists es a set of persons who amused themselves hy constructing worlds, and thsn pulling them to pieces again; and it must he confessed thet the recklsss guesses of an imagination not always scientific, which havs at times obtained a temporary notoriety, did in soms cases justify the charge. Still it should he remembered, as M. Dauhres points out, that ths study of the earth, after having hesn for a long time hypothetical, did really, towards the snd of ths last century, enter "une voie positive," where it has taken for its guide the observation of fects.

Exactly a century has elapsed since the first appsarance of de Saussurs's works on the Alps. Wernsr and Hutton followed shortly, and the endless dissertations of their respective disciples may perhaps have had something to do with ths strictures previonsly msntioned, especially as they took root in thoss soils where discussion on subjects more or less transcendsntal ssems to bs en indigenous plant. Yet, evsn in the earliest years of the present century, the importancs to ths geologist of ths synthesis of minerals was recognized, although it was at one tims considered that the divergencs hetween certein minerals and the most analagous compounds which the lahoratory could furnish was such as to render their actual reproduction impossihle. Ths differencs hetween crystallins quartz and the emorphous silica of the chemist was almost as great as that hetween the diamond and the soot of our chimneys. To effect such marvels, lapse of time and csrtain occult actions were deemed necessary, or, as Leihnitz put it in the *Protogæa*, "il faut du temps, du repos, et de l'espacs."

In 1805 Hall experimented with a view to control some of Hutton's views, and succeeded in making chalk semi-crystalline under the influence of heat and pressure, whilst Haussmsn, a few years after, turned to account in the interpretation of geological phenomena the sxamination of ths silicates of the metallurgical furnaces.

The year 1823 marks a discovery of the ntmost importancs. Mitscherlich recognized that psridot, pyroxsne and other mineral species crystallized in slags, and Berthier, hy mslting silica with different hases in definite proportions, actually ohtained crystalline comhinations idsntical with those of nature, especially pyroxens. It was the first step made in the direct synthesis of minerals.

The nsxt step was to overcome the difficulty presented hy insoluhle comhinations in the wet way, and Haidinger, heing desirous of controlling Von Buch's hypothesis, inaugurated ths employmsnt of water under pressure in the formation of dolomits, whilst the numerous minerals accumulated in metalliferous lodes, which observation had shown could not have been conveyed either in a state of volatilization or of fusion, attracted attention with a view to their reproduction in the wet way—no easy task, when it was seen that silica itself in separating from water assumes the condition of opal rather than of quartz. This void in synthstic mineralogy Ssnarmont fillsd hy the employment of appropriate suhstances, such as ars most widely distrihuted in existing thsrmal springs, operating at temperatures ahove 100° C., and under pressure. In this way he succeeded in the formation of quartz crystals, small, it is true, hut possessed of ths physical and optical as well as the chemical properties of natural quartz. Since then another triumph of synthesis has heen scored hy Hantefeuille in the artificial production of orthose and albite.

Such ie a hrief outline of the very useful historical sketch which M. Dauhree gives as a prelude to the resnlts of his own researches, which, after being continued for 40 years, and scattered through many publications, are now comprised in one volume. Thie will enable the readsr more fully to estimate the value of his lahors, and at the same time will materially assist the geologist who has not carried on similar work. The hearings of experimental geology may assist in explaining many of the chemical, physical and mechanical phenomena, which he meets with in the field, and the causes of which are difficult to undsrstand, considering the complex suhsequent modifications whicb have too frequently masked their primal origin.

The first section of the volume deals with *chemical and physical phenomena* in three chapters; wherein the author showe the application of the experimental method; 1st, to the history of the metalliferous deposits; 2d, to tbe etudy of metamorphic and eruptive rocks; 3d, to the history of volcanic phenomena. A portion of the second ection, where the author describes the chemical decomposition of silicates, euch as feldspar, hy mechanical causes, in part helongs to the subjects discussed in the first section.

The history of metalliferous deposits is divided into (1) stanniferous masses, (2) "gites sulfures," commonly called plumhiferous, (3) "gites de platine."

In dealing with the *stanniferous* group, M. Dauhree can point out how accurately he descrihsd in the *Annales de Mines*, nearly 40 years ago, the origin and conetitution of tin deposits. The peculiarities of this group—so different from tbe other, in wbich the electro negative is mainly sulphur—ars noted; the mineral occurs as an oxide, and the gangues are not the sams. The metalliferous fissures, too, ere not like ordinary lodes in the proper senss of the term, hut seem to hs more like a numher of small shrinkage cracks, and the neighboring rock is charged for some distance with the mineral (cassiterite). This network of small veins contains an enormous proportion of quartz, and the oxide of tin is further escorted hy certain minerals unusual in ordinary lodes—such as topaz, pycnite, tourmeline (schorl), axinite and elso apatits—so that the accompanying elements, hesides silicon are horon and fluorine, and frequently phosphorous and arsenic, forming comhinations which cannot he explained hy ths mere chemical enalogies of these different clements, as is the natural association of iron with manganese, or cobalt with nickel. These observations havs heen supplemented in a recent contrihution to the *Quart. Journ. Geol. Soc.*, hy Dr. Ls Nsve Foster, who gives some very interesting details, especially as to the fact of lodes containing from one to three per cent. of cassiterite, themselves consisting of schorl rock, which he describes as a matted mass of fine needles of schorl in a ground mass of quartz, with granules of cassiterite scattered through it, or arranged in little strings and veins. From thess considerations it may he gathered that fluorine was the agent which psrformed at once the part of carrier and mineralizer, thus discharging the task allotted to snlphur in the plumhiferous (sulphureted) group.

Flouride of tin is a compound stahle at high temperatures, aud in all prohahility the tin came up as fluoride from the general reservoir of ths heavy metals. Boron, too, has a tendency to comhins with fluoride, end fluoride of horon heing volatile would also ascend. In the artificial preparation of cassiterits, effected hy M. Dauhree, as long ago as 1841, not having conveniences for the employment of fluoridss, he brought together in a porcelain tuhe the vapor of hichloride of tin and steam at a temperature helow 300° C. Small hut well-formed crystals resulted, having a density of 6.72, and adhsring closely to the sides of ths tuhe. Similarly, by employing perchloride of titanium, he obtained small crystalline grains of titanic acid. The artificial production of apatite was affected hy the ection of perchloride of phosphorus, first on caustic lims and afterwards on chalk, ths result being a true chlor-apatite. In these operations some chloride of silicon was formed at the expense of the porcelain. Thus hs ergnes, that if the vapors of stannic chloride and fluoride, which appear to have formed the stanniferous deposits, were accompanied by perchloride of phosphorus, this lattsr, when encountering lime in the enveloping rocks, must have formed apatite accompanied hy fluor spar.

Still referring to this subject, M. Dauhree, whilst apologizing for introducing his own work as that of a geologist rather than of a chemist, mentions that, 17 years after thcse experiments (viz. in 1850), Deville produced corundum by means of volatile metallic fluorides reacting on oxidized compounds, and that by means of fluoride of titanium Hautefsuille reproduced the three forms of titanic acid.

The *sulphureted* group, heing the one in which the majority of metals occur, is not dealt with generally, but M. Dauhree points out the existencs of analagous products of recsnt formation in warm springs, such as those of Bourbonne-les-Bains. An ahstract of the author's paper in the *Comptes Rendus*, for 1875, has already appsared in this magazine. Bonrhonne-les-Bains is not the only place where Roman coins have yielded metallic sulphides, hut there the circumstances seem to have heen peculiarly favorahle, and M. Dauhree illustratee these hy a eeries of cuts with much exactitude. Some 20 kilogrammes of hronze coins were found at the hottom of a Roman well *(puisard)*, associated with black organic mud, where they had been bathed for 16 centuries hy mineral waters at present containing eight grammee of solid matter to the liter, and having a temperature of 68° C. at the principal point of discharge. In a permeahle hed towards tbe hottom were evidences of hronze coins, etc., which had undergone decomposition, more or less complete. Four species of cupric sulphide result. The tin appears as a white earthy crust, consisting chiefly of oxide. The lead pipes in placee were coated with phosgenite (carhonate of lead and chloride of lead), which, hy the reducing action of organic matter in the presence of gypsum, has yielded emall hut definite crystals of galena.

Such an automatic laboratory, containing within itself a sort of electro-chemical apparatus, was a valuahle legacy of the Romanized Gaul to his descendants, not to he appraised so much for its metallic worth, as for its utility in supplementing those essays in synthesis which the shortnese of human life too often forhids to he accomplished within the limits assigned to one generation. We also learn in this case how Nature ie gradually reversing the operations of man; remarrying, as it were, those elements which had heen divorced hy the laborious operations of the miner and the smelter.

It is just possihle that discoveries such as the preceding, confirming our knowledge of what can he done in the wet way in warm springs and mine-waters within periods short in a geological sense, may tend to exaggerate the importance of the part played hy water as a solvent at a time when the great sulphureted lodes received the hulk of their metallic charge. These phenomena merely represent the final stagcs of processes infinitely more energetic. M. Dauhres asks, what should we see if it were possihle to descend the fractures serving as channels for the ascent of the thermal waters? We should prohahly find additional proof of the important modifications produced hy water at increasing temperatures, but this would not lessen the prohability that the metals associated with lead would have heen volatilized from depths where no water is in comhination with sulphur, selenium, tellurium or arssnic, just as he has shown how tin has heen volatilized in comhinatiou with fluorine.

Ths second portion of the chemical and physical suhdivisiou of the suhject treats of the *metamorphic and eruptive rocks*, and of the application of the experimental msthod of their study. The author interprets the word "metamorphism," in its widest and most conventional sense; 1st, as simple moleculer re-arrangemeut; 2d, as crystalline re-arrangement hased on matter ready on ths spot; 3d, as crystalline re-arrangement with importation of new or elimination of old matter.

Metamorphism of juxtaposition is the term he prefers for those modifications which ere effected hy invading rocks within moderate distancss, though such modifications mey reach as far as 3,000 meters in the cass of granitic invasions. In dealing with regional mstamorphism he expressly excludes the old gneisses and mica schists which uuderlie the stretified fossilliferous terranes, and confines his observations to the schistoss masses whose metamorphic origin is, he says, clearly demonstrated.

Tbis is certainly hegging a question which many persons would he hy uo means willing to conceds. Ths ahove quoted remarks were originally published hy M. Dauhree, in 1859, and have not heen altered in ths present work, so thet no rsference is made to the uumerous memoirs which have appeared since that date. It is clear that M. Dauhree still continues a strong helieve in the doctrine of Epigenesis—that Hibernian form of metamorphism which is accompanied hy considerable change of substance. It somewhat detrects, therefore, from the interest of this part of his work, that he has not thought fit to notice the numerous papers contrihuted to this subject of lete years. We find him, for instance, stating that this modification (regional metamorphism), is easily recognized in such countries es Wales, the Taunus, and the Ardennes. Certainly the alleged metamorphism of portions of the former country has been disputed on good grounds hy very competent ohservers, who, although they probahly differ in dstails, have adduced most excellent evidencs that certain beds of obscurs origin are hy no means the metamorphosed equivalents of heds slsewhere recognized as forming part of sedimsntary formations of known age. We leave the Taunus and ths Ardennes to ths consideration of foreign critics.

In the Alps there seems to he hetter evidence of metamorphism as understood hy M. Dauhree, but the strongest case is ths well-known one in the Vosges, where, as observed hy M. Delesse, the organic remaius so well preserved at Rothau deserve to bs considered as the classical monuments of metamorphism. Hsre syenitic granits has penetrated devonian beds, which for several hundred meters from the point of contact are entirely modified. At certain points the altered rock consists of a compound of lamellar pyroxene, epidots and compact garnet, associated with ahundance of fossil corals. The cavities bristle with elongated crystals of amphibole, etc. Such a case as this should in fairness hs quoted under the head of metamorphism of juxtaposition; hut anyhow it is a hard nut for those who dishelieve in the extsnsive alteration of sedimentary heds to crack.

The causes of metamorphism are next considered, and here it is again evident that change of substance as well as of form is the kind of metamorphism most frequently present in the mind of the author. Heat (which is from two sources), even when aided by certain vapors, is not efficient; we must, then, look to water as having performed an important part "dans les pheuomenes metamorphiques aussi hien que dans les eruptions des volcans." This requires to he further supplemented hy pressure.

It hecame necessary, therefore, in the application of the experimental method, to ascertain how far heat, water and pressure could bs made to reproduce the principal phenomena of metamorphism. The means to effect this are shown in a eeriss of illustrations, the general principle heing to opsrate upon a glass tuhe placed inside one of iron. The tuhes were exposed to a temperature of ahout 400° C. during several weeks. It was found that pure water suitahly superheated will transform an anhydrous silicate, such as glass, into a hydrated silicate of zeolitic character. A glass, for instance, containing silica 68.4, lime 12.0, magnesia 0.5, soda 14.7, alumina 4.9, was found to lose silica, alkali and alumina, whilst the relative amount of lime seeme to have increased, and the new silicate had a fixed quantity of water.

The results varied according to the different nature of the glass, and of the substance added to the water. Crystals of quartz were frequently formed. The weight of the water which effected all these alterations was only one-third of that of the glass transformed. Obsidians and perlites were also tried with partial success; some crystals of feldspar and pyroxene associated with these underwent no alteration, hut were "sugared" over with little crystals of quartz. M. Dauhree enlarges on the wonderful results which have thus heen ohtained in the wet way, even to the production of an anhydrous silicate, such as pyroxene, at temperatures far helow the fusing point of the minerel. The application of these results to the phsnomena of mstamorphism is obvious, and explains, amongst other things, hy the ready liberation of silica from compound silicates, the formation of quartz on a large scale.

The Roman masonry at Plombieres and elsewhere, so long in contact with warm mineral springs, effords an admirahls instancs of "contemporaneous metamorphism." The reaction of the alkaline waters upon the mortar and bricks hes resulted in the deposit of chalcedony and of many zeolitic minerals. Microscopic sections of hricks with geodes lined with chahasite, etc., afford very effective pictures, and many interesting chemical details are added. The curious white concretionary substance called *Plombierite* — gelatinous when moist, end transported and deposited by the water like silica itself—appears, according to Fouque's analysis, to be compound or mixturs of carhonate and silicate of lime with water. All these results have heen effected at moderate temperatures and without pressure. A valuahle digest of thess facts appeared in ths *Quart. Journ. Geol. Soc.* for 1878 (vol. xxxiv.), where M. Dauhres observes that zeolitic minerals may hs considered as a kind of "extract" of the rocks thet have heen subjected to a continued lixiviation.

Water, be thsrefore insists, has played an important part in the crystallization hoth of eruptive end of metamorphic rocks, especielly as it permits the crystallization of silicates at temperatures far helow their fusing points; ws must thus look to the hydrothermal rether than to the dry way for the explenation of the origin of silicates in a large part of the rocks.

Under thess circumstances, and adopting tbe very comprehensive word "metamorphism" in the sense used hy M. Daubree, it will hecome more difficult than ever to distinguish hetween altered and erupted masses when viewed merely under their petrological aspects.

Not the least interesting of M. Dauhree's experiments was made with a view to determine how far the capillary infiltration of water could supply the immense quantities used in volcanic eruptions. A suitable apparatus enahled tbe author to demonstrate thet liquid water will force its way through a slab of close sandstone against a very considerahle prsssure of steam. Hs therefore infers, that iu spite of ths powerful upward pressurs of aqueous vapor, the cooler waters of the earth's surface do find thsir way through the rocks themselves, and that what is known as quarry water is nothing hut this feeder surprised at the commcncement of its downward journey.

The secoud section of tbe work, heing devoted to mechanical phenomena, is worthy of a separats notice, but there are some subjects discussed which have a chemical hearing. Important experiments were carried on with a view to ascertain how far ths decomposition of silicates is effected hy mechanical causes. There is prohahly no question iu the whole work which has a more important geological hearing than this, because it enahles us to form some idea how the *debris* of crystalline rocks is chemically altered during the process of degradation. Dr. Sterry Hunt has always smphasized this point, and those who question the wholesale introduction of fresh matter into rocks which the ultra-metamorphic school have taught, attach much weight to their cbemical composition as controlling the possihilities of alteration.

Orthose in fragments was rotated in a cylinder along with distilled water. When ths experiment was performed in an iron cylinder, 3 kilogrammes of feldspar, after a journey equal to 460 kilometers, yielded to 5 liters of water 12½ grammes of potash, with very small quantities of eilica and alumina. To effect such a decomposition mechanical division and the solvent action of water must he exercised simultaneously. Curiously enough the presence of chloride of sodium arrests the decomposition. The presence of carbonic acid facilitates the eolution, and much silica, as well as potash, is dissolved. Obsidian and leucite are but elightly attacked. In these operations the mud ohtained is in such a fine state of division as to render the liquid opaline, and it takes some days to sttle: the quantity of potash retained is still very considerahle. Such a substance would form the "phyllades" or argillaceous sclists which occur in the etratified terrance at different geological stages: these often contain from 6% to 7% of potash.

Finally, M. Daubree once more returns to the suhject of metamorphism, and having observed that dry clay triturated against itself, had its temperature raised in three-quarters of an hour from 18° C. to 40° C., speculatee on the possihility of the transformation of mechanical force into heat in regions such as the Alps, during the period when those forces acted with the greatest intensity.

*Etudes Synthetiques de Geologie experimentalie. Premiere partie. Application de la methode experimentalie a l'etude de divers phenomenes geologiques. Par A. Daubree. 8vo. (Paris, 1879.) Reviewed by W. H. Hudleston in the *Geological Magazine*.

A United States patent has heen granted to A. E. Mery, of Paris, for a composition for applying colors, specifying the following ingredients: Glue, 25 parts (hy weights); glycerine, 534 parts; water, 208 parts; white wax, 208 parts; strong solution of ammonia, 12½ parts, and usin, 12½ parts, dissolved in ether. Any coloring matter may he mixed with this paste, thereby forming a plant.

Bichloride of mercury, known commonly by the name of corrosive suhlimate, will remove the staine of nitrate of silver.

France annually makes 750,000 tons of excellent fuel from the dust of her coal mines.

Red Canyon Mines, Nevada.

In consequence of some very rich gold rocks and other indications found at this place, which lies 35 miles east nf south of Virginia City in a direct line nr 45 miles by road, it is supposed ths mother lode has been discoverod. The Gold Hill *News* of the 6th inst. says on the subject generally: On the table before the writer is a specimen nf gold rock from noo of the new finds which is fabulously rich in free gold. It was taken from a large specimen in Virginia, which is better than the piece secured. It is so fine a specimen of gold quartz that it is useless to assay it. It was sent in by Bob Morrison, and was taken from an uooamed extonsion of ths Hester Holbrook claim. It came from a ledge three feet in width of milling rock. Of this width, six inches next ths hanging wall are of the rich rock shown. Free gold is found in large qnantities all through the vein.

In the immediate vicinity nf the new fiud aro Gray & Carter and the Golden Belt claims, which with tho Hester Holbrook are the principal locations of the section. The portion of Red canyon in which these mines are located has plenty of water to run mills, and reducing machioery and oue arastra is now runuing on Gray & Carter rock, but has not yst cleaned up. The mins from which the specimens were sent is being developed hy a few men on thsir owu account. If there is as much rock thers of the qnality before us as is reported, they will have all the mooey they want.

Persons who are inquiring the route there may be interested in the following, which will be found to be tolerahly correct. From Dayton tho road leads np El Dorado canyon about eleven miles to the signboard. Here the fork leading np Pine Nut valley is taken to the head of that valley, ahout seven miles. At this point the left fork of the road is followed snme eleven miles to the Winters mine. This is the beginning of the mining section. Thus it will he seen that the camp lies about on the line run out by "Old Man" Gould, in the early days of the Comstock, as the trend of the mineral bearing bslt here encountered.

The section reached as above is rongh enough for the delight of all prospectors. From the Winters mine, one road takes up to the top of the ridgs—the highest in the section—and leads to the center fork of Red canyon. Another road keeps np the principal ravine and some six miles further on are found the group of mines which includes the new find. They lie at the head of the canyon, and near them comes in the road from Carson. A little further east is the silver mine of Gray & Carter. The section is also very readily reached by the prison road from Carson. Red canyon is a sort of pass across the ridge, and after reaching np towards the top bends to the east and rnns down toward Wellington's station. But the mines abovementioned lie west of the summit and on the western water-shed.

Jnst at present the excitement is over the gold rock of the section. There are, however, some cool heads in that section who have heen searching for something further. N. B. Daniels, of Virginia, is one of tbese, and he and R. M. Ballard, foreman of the Ophir, think they have fouud the mother lode, a silver-hearing vein some four miles further along, on the eastern slope and near the summit of the make of land. This lode is, on the surface, 100 ft in width. A shaft has heen sunk on it 30 ft and it has been found to be well defined and the ore assays from $40 to $300. Locations have heen made and holding work done, and now they are waiting for another season in which to more fnlly prospect their claims.

French Imitation of Gold.—One of the most remarkable achievements in ths production of an alloy for perfectly imitating gold, is said to have been made by M. Meiffren, of Marseilles, the alloy standing a very acid test, and its specific gravity heiog also extremely close to that of gold of ths fioeness indicated by the acid test—being, therefore, peculiarly adapted to the manufacture of jewelry. The method of production in this case is to place in a crucible, copper as pure as possible, platinum and tungstic acid in proportions as follows: Copper, 800 grammes, 25 of platinum, 10 of tungstic acid, 175 of gold; when these metals are completely melted they are stirred and granulated by being run into water containing 500 grammes of slacked lime and the same of carhonate of potash for every cnbic meter of water, this mixtnre, dissolved in water, having the property of rendering the alloy still purer. The granulated metal is next collected, dried and, after remelting in a crucible, a certain quantity of fine gold is added. In this way an alloy results which, when rnn into ingots, presents the appearance of red gold of the standard of 750-1,000ths. The color of the alloy may he changed by varying the proportions of the different metals. As a flux, horic acid, nitrate of soda and chloride of sodium, previously melted together in equal proportion, are nsed, the proportion of flux employed being 25 grammes per kilogramme of the alloy.

Almost the universal article used on the continent for kindling fires are dry pine cones. A couple of these are nsnally enough to start a fire of dry wood, and several of them contain enough resinous material to start a coal fire without other kindling. They are readily lighted with a match, and are free from dust and insects. In Paris and other large cities on the continent scarcely any other than pine conee are used for kindling purposes in the hotels.

Useful Information.

To Estimate the Constituents of Cereals. Messrs. Hayes, of Roxbury, and Jackson, of Boston, Mass., have discovered a way of measuring approximately the valuable constituents of grains. If a kernel of corn be split longitudinally, and immersed in an aqueous solution of sulphate of copper, the germ, or "chit," only becomes colored green, thersby beautifully defining the limits of the phosphates by the formation of phosphate nf copper. If a kernel of corn be split opeu and thrown into n solution of sulph-hydrate of ammooia, the "chit" will soon be changed to a dark olive color, which is due to a change of the salts of iron in the seed to a sulphuret of that metal; a dark-colored matter forming with the ammonia turns tho vegetahls coloring matter yellow, and ths two colors combined produce an olive. Again, by takiug split specimens of corn, or other grains, and soaking them in a tincture of iodine, the limits of ths starch and dextrine will be distinctly defined—the iodine striking an intense blue with the starch, and a deep port wioe red with the dextrine; so that, from this test, a rich violet (heiug the combination of the blue and red colors) will indicate the presence of hoth the starch and dextrine in the grain. If the oil he extracted from the transparent horny part of the corn hy means of alcohol or ether, the tincture of iodine will show the presence of starch in that part of the grain associated with the gluten. By these means we may easily cause any of nur cereal graios to represent to us the extent and precise limits of its phosphates, iron, dextrine, starch and oil; and thus, by the eye alone, we may form an approximate estimate of the relative proportions of these ingredients.—*American Miller.*

Destruction of Fire-Damp.—A mining student of Freiberg hns invented an improved lamp for the protection of life against explosions of fire-damp. It is based upon the property possessed by ethiops of platinnm of condensing on its surface not only exygen hut also light carbureted hydrogen, even when only small quantities of it exist in ths atmosphere, and in this close contact of the two gases effecting a dark combustion of the carbureted hydrogen. A wire gauze lamp is charged with pieces of pnmice stone, impregnated with ethiops of platinum. These lumps are surrounded hy coke to protect them, and enclosed in the lamp, which is then ready. In the presence of fire-damp the ethiops of platinum attracts the gas, which is gradually and harmlessly destroyed, the consumption being within ths ganze and not of a nature to ignite a surrounding explosive atmosphere. Mr. Korner, the inventor, points out that a great advantage of this safety inflammahle air-consuming lamp consists in its not requiring continuous atteution and maintenance, as the ethiops of platinum will consume a large quantity of the light carhureted hydrogen without losing its properties. Control of the lamp is effected through the escaping heat. Lamps as described may he advantageously used in all places where there is inflammable air.

Meats Cooked by Cold.—It seems unlikely at first thought, yet it is a fact that extreme cold produces in organic substances effects closely resemhling those of heat. Thus, contact with frozen mercury gives the same sensation as contact with fire; and meat that has heen exposed to very low temperature assumes a condition like that produced by heat. This action of intense cold has heen turned to account for economical nses hy Dr. Sawiczevosky, a Hnngarian chemist, as we learn from *La Nature.* He snbjects fresh meats to a temperature of minus 33° Fahrenheit, and having thus "cooked them hy cold," seals them hermetically in tin cans. The results are represented as beiug entirely satisfactory. The meat, when taken out of the can a long time afterward, is found to he, as regards its appearance and its odor, in all respects as inviting as at first. A German government commission has made experiments with this process, and in consequence two naval vessels dispatched on a voyage of circumnavigation were provided with meat prepared in this way. Hungary has an establishment for preserving meats hy this process.

Treatment of New Wooden Utensils.—Wooden vessels for containing articles of food, wine, etc., also wooden vessels for culinary purposes, can he rendered fit for immediate use hy the removal of the unpleasant extractive matters hy treatment with a solution of washing soda, thus: An ordinary barrel should he filled half full of water, and a solution of ahout two pounds of soda in as mnch water as will dissolve it poured in, and the liqnids thoroughly mixed hy shaking the barrel, which should then he filled to the hung with water, and allowed to remain from 12 to 14 hours; then, after withdrawing the discolored liquid, it shonld he well rinsed and filled with puro water, and should remain a few hours more, when it will be fit for use. Other wooden utensils may he similarly treated.

Potato Bugs Utilized.—Those who like to find "good in everything" will he gratified to learn that it appears from experiments described in the *Journal of Pharmacy* that the freeh powder of the potato hug yields ahout 1⅓% of pure cantharidin. This is a large product, and no doubt these pests will be increasingly used as a cheap source of this valuable remedy.

Something New in Boiler Making.—We learn from English journals that a few weeks ago a numhcr of eogineers visited the Park View steel works, Owlerton, near Sheffield, for the purposo of seoing Mr. George Whitehead's new process for producing weldless and seamless steel and iron boilers. A ring of steel is cast and heated. Then it is placed npon a large roller, and by the aid of smaller rollers it is enlarged to the requisite dimensions. The ring is run from one cod of the roller to the other, and is returoed hy a reversing of the machinery. The other portions necessary for the completion of the boiler are subsequently put on with bolts. Mr. Whitehsad states that boilers constructed on this process will stand twics the pressnre of thoss made of riveted plates.

A New Cement.—Asbestos powder made into a thick paste with the liquid silicate of soda, according to a leading English anthority, is stated to he found to be nf great advantags for making joints, fitting taps, connecting pipes, and filling cracks in retorts. It is said to he of great service in the manufacture of nitric acid, sulphuric acid, and other products, hecauss it can be as easily made as applied, hardens rapidly, and prevents the escape of acid vapors.

New Coloring Matter.—Mr. T. L. Phipson reports to the French Academy of Sciences the discovery of a new rose-red coloring matter, which he has succeeded in extracting from the little hlood-red alga, found at the base of damp walls. It rsssmhles no other known color, and exhihits considerahle analogy with ths hæmoglobine of the blood. It is the first time that a suhstancs of this kind has been met with in the vegetahle kingdom.

A New Carbazol from Coal Tar.—C. Graebe and W. Knecht. This compound, for which ths authors propose no name, is represented by the formula $C_{16}H_{11}N$. It melts at 330°, dissolves scarcely if at all in cold alcohol and henzol, sparingly in boiling benzol and glacial acetic acid. It is moderately soluhle in hot aniline. The solution has an intonse blue fluorescence.

Good Health.

Water Infection in Diphtheria.

Dr. Benjamin Browning, the Health Officer of Rotherhithe, (London), has an interesting paper on this snbject in the *Sanitary Record.* He gives a variety of cases, occurring in city and rural districts, which appear to prove heyond a doubt that diphtheria may be caused hy polluted water. The disease has been found to prevail in families using the water, while their neighbors who did not use it, hut who were otherwise exposed to the same chances of infection, were exempt. In one instance he met with seven cases of diphtheria in the family of a railway station-master. He says: "I could ascertain no previous contsgion, but found the existence of the customary polluted shallow well, close to the public latrine, the whole premises heing isolated, standing on a lofty chalky emhankment. Two casual visitors to the station (not to the dwelling-house) who drank some water in the waiting-room also contracted the disease. There was no more of it hefore or afterwards in this parish while I knew it."

Dr. Browning seems to have heen careful to satisfy himself that the diseass could not have had any other origin than the bad water. On this point he says:

"In the country epidemics I have mentioned, at their commencement, no direct personal contagion could be made out, although it was anxiously sought for; aerial infection seemed everywhere contra-indicated, owing to the open and breezy situation of nearly all the implicated dwellings; in all of them the drinking water was organically impure, and receivsd surface filth of every description; and in the town cases there was also clear evidence of water pollution by sewer-gas or fetid smanations, if not by actual deposit of dirt. And I venture to submit that I have therefore supplied some of that 'evidence,' which is by Dr. Parkes and others deemed 'still wanting' to prove the 'production of diphtheria by contaminated water.'"

Not satisfied, however, with this logical evidence, Dr. Browning determiued to settle the question hy direct experiment npon the lower animals; and he actually succeeded in infecting two kittens with the disease, by feeding one with milk mixed with water in which he had kept diphtheritic false membrane and sputnm, and the other with milk adulterated with water taken from the cistern of a house where a fatal case of diphtheria had recently occurred. Microscopic specimens of the diphtheritic membranes from these animals were shown at a meeting of medical gentlemen, none of whom were committed to Dr. Browning's theory, and pronounced hy them to he identical with specimens taken from human heings. If this testimony is not accepted as conclusive, it must at least be admitted that it is of sufficient importance to show that further experiments and investigations should be made in order to confirm or refute it.

A Pleasant Remedy for Toothache.—Dr. T. C. Osborn, in the *Medical Brief*, states that his cook came to him with a swollen cheek, asking for something to relieve the toothacho with which she had been suffering all tho night. He was on the point nf sending her to a dantist, when it occorred to him that there was in the house a vial nf compound tincture of benzoin. "After cleansing the decayed tooth," he says, "I saturated a pledget of cotton lint with the tincture, and packed it well into the cavity, hoping this would suffice for the tims, and told her to come hack in two or thres hours if she was not relieved. I was turning away, when she said it might not he necessary, perhaps, as the pain was already gone. Supposing her faith had a large share in the relief, I would not allow myself to think that the medicine bad anything to do with the cure any more than so much hot water would have had. But when I arrived at my office, two nther patients were awaiting me with the same affliction, and I determined, by way of experiment, to use the same remedy. To my agreeahle surprise both patients declared themselves immediately relieved, and begged a vial of ths tincture for future use. During the winter a nnmher of similar cases applied, and were instantly relieved hy the samo treatment, all expressing mnch satisfaction with the remedy. In December I told my druggist of the discovery, and recommended him to sell it to any person applying for 'toothache drops.' This, he reports, he has done, and that every one seems delighted with the medicine."

Replanting Teeth.—G. W. Weld, dental surgeon, recently read hefore the First District Dental Society of New York a paper on the subject of replanting teeth. The root of the tooth is first extracted and the decayed portion cut squarely off at or directly under the margin of the gum. A porcelain crown with a tapering screw made of platinum and iridium, which had heen securely *baked* in the center psrfectly parallel with its length, is then firmly scrswed into the pulp-canal of the root, ths nsrve having first heen removed and the canal enlarged hy reaming out with an engine-reamer. To facilitate the introduction of the screw, a preparatory thread is cut in the root with a tap. This process establishes a very strong attachment hetwcon the natural root and the porcelain crown, and with the additional aid of cement in the canal, it is made perfect. When this operation is completed (which requires from 15 to 20 minntos) the socket is syringed out with tepid water, and the root with the new crown attached is gently but firmly pressed iuto its original position. Perfect reattachmsnt ensues in from two to four weeks. There is seldom any pain attending the operation, and very little inflammation.

Phenic Acid and Yellow Fever.—A French physician, hetter known as the heir to the once famous Duke of Gramont-Caderousse than in the capacity of a practitioner, Dr. Declat, hss just completed by proxy, at Senegal, experiments on the treatment of yellow fever, with apparently very satisfactory results. Dr. Declat, has been led to infer theoretically from ths symptoms of the disease that phenic acid might be used in such cases with soms prohability of success, as a prophylactic as well as a remedy. Some months ago he forwarded a dozen bottles of the compound to a missionary, with practical instructions as to its use, and the request of a report on the facts. The missionary, who seems to he a clevsr, enlightened man, with some knowledge of medicine and considerable experience of yellow fever, now writes that not only did he actually rescue from imminent death by dint of the remedy several natives who were writhing under the pangs of the disease, hut he himself owes his life to its use. This, indeed, if confirmed on a large scale, would prove a hoon to America and the west coast of Africa.

Another Cure for Sea-Sickness.—A writer, Mr. Chapham, says in the London *Lancet* that nitrite of amyl is a sure cure for ssa-sickness. "With due attention to details the drug is curative in at least 90% of all cases treated." He directs that not more than three drops he taken at a time, inhaled from a handkerchief held close to the nose. It should not he used except under medical advice. The patient when under this treatment should lie in hed, hecause a good sleep is generally the first result, from which the person awakes wanting to eat. It is usually better to allow one fit of vomiting to occur hsfore the treatment is commenced, "to insure the *bona fide* character of the seizure." Some, however, do not vomit at all, but are very ill, and with these Mr. Chapham considers the nitrate equally successful.

Laxative Bread.—Mr. W. H. Taylor states in the London *Lancet* that he has lately had hread prepared as follows, and it found it most useful in ordinary constipation, and as a laxative in piles: Coarse Scotch oatmeal, whole wheaten flour, coarse ordinary flour, of each equal parts. The hread can he lightened hy yeast, or, to a two-pouud loaf, one tablespoonful of baking-powder, made of four ounces of bicarbonate of soda, three ounces of tartaric acid, one pound of ordinary flour, ruhhed well together, and kept dry in a tin or well-corked bottle. The bread keeps well, and a two-pound loaf will he sufficient for a week, taking a portion once or twice a day in conjunction with ordinary bread.

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Annual Meeting—Hillside Mill and Mining Co.

The Week.

One of the indications of returning prosperity is the advance in price of all kinds of merchandise. The mere fact that goods are being marked up does not indicate anything except when connected with the prices ruling at supply centers, which is now the case, and shows an increasing demand. Iron, nails and tinware have risen fully 50%, while lead and quicksilver have gone up proportionately. Even silver has have felt the movement and have an upward tendency. Snow has already made its appearance in the mountains in sufficient quantities in some places to compel a suspension of mining operations, particularly around Leadville, Colorado, where, in the mountains, the ground is covered with from two to eight feet of snow. The various mining industries are prosperous, with the exception, perhaps, of some of the hydraulic mines in this State which are afflicted with restraining orders from the civil courts.

The strike on the 2100 level of the Hale and Norcross discloses the fact that there is a rich vein of ore there with every indication of permanency. That, of course, taking the reports to be true.

The railroad projects of the country are advancing steadily. Jay Cooke has been able to pay nearly all of his indebtedness by reason of the recent advance in Northern Pacific. The Southern Pacific is pushing towards Mesilla, while the Texas Pacific is building towards the Pacific. The Atcheson, Topeka & Santa Fe has its eye on San Diego as a terminus. All of these different railroads will soon converge at some point not yet known to the public. The country in the meantime is improving its prospects, and the means of transportation speedily being afforded to heretofore remote and inaccessible regions will open up new avenues of trade and commerce, which must, to a great degree, enure to the benefit of the Pacific coast generally.

An Accurate Mine Survey.

A very difficult piece of engineering work has recently been accomplished at the New Almaden Quicksilver mines by Hennen Jennings, C. E., the facts in connection with which will be of interest to mining engineers. Connection has been made between the Randol and Santa Isabel shafts on the so-called 1700 level, the survey being made under peculiar difficulties, but with strikingly accurate results.

The horizontal distance between the Randol and Isabel shafts is 1,280 feet, and the difference of level between their collars 300 feet. The connecting drifts were started on the same level from these shafts. From the Randol 1,223 feet below, and from the Isabel 927 feet below the collar. There is a tunnel connecting the surface with a point of the Randol shaft 331 feet below its collar, and it was through this tunnel that the deflection lines were carried, and from this level that the wires were suspended. Both the drifts below and the tunnel above were run partly on a curve, and, as the surface passed over was mountainous and abrupt, it was necessary to make 17 angles in the circuit. The total length of circuit (horizontal length) was 3,468 feet, 1,337 feet of which was on the connecting drifts, connection being made 430 feet from the Isabel shaft.

The main difficulty encountered was one which is seldom met with in so appalling a form in mine surveying, viz: that of projecting a 2 foot 7 inch base line 900 feet down a vertical shaft by means of two plumb lines disturbed by falling water and strong currents of air. Such was the case in the Randol shaft. The base in the Isabel shaft was 3 feet 4 inches, and the distance plumbed, 940 feet.

For plumb lines Mr. Jennings used the finest quality of steel piano wires one-fiftieth of an inch in diameter, and without splice, suspending them above the point of observation at the top. Attached to these at the bottom were 18 pound plumb-bobs submerged in molasses.

The apparatus used to suspend these wires and to shift them into any required position was introduced here by Hamilton Smith, C. E., and is exceedingly convenient in its details.

The transit used to prolong the line defined by the two suspended wires was provided with a slide plate movable by two slow-motion screws.

In order to prolong this base line into the drift, the transit was placed in approximate line with, and about 14 feet distant from, the wires. By means of a prolonged and paine-taking study of the oscillations of the wires and a corresponding shifting of the body of the instrument on the slide plate (by means of the slow-motion screws) the line of collimation of the instrument was eventually made to pass through the average of the oscillations of each wire, and thus the base was prolonged.

Considerable time was consumed in placing the wires and prolonging the base. In one instance 28 hours were spent in doing this in the Randol shaft.

The result of this survey was very much more accurate than Mr. Jennings could have anticipated, considering the difficulties under which the work was carried on.

The error of alignment was 0.45 of a foot; the error of distance, 0.49 of a foot; and the error of level only 0.025 of a foot.

In order to weigh the accuracy of this result, suppose in determining the average of the oscillations of one wire in the Randol shaft, an error of 0.01 of a foot had occurred, all of the rest of the work being perfect, the error of alignment at the point of connection would have then amounted to more than 3½ feet.

F. Von Leicht, C. E., checked the survey shortly before connection was made. Mr. Jennings says that he profited to a considerable extent by the experience of Mr. Ross E. Browne, his predecessor, having acted as Mr. Browne's assistant for a year previous to undertaking this connection, in similar, though less difficult work.

NEW JOURNALISTIC VENTURE.—*La Sonora* is the title of a little weekly just started at Tucson, Arizona, under the editorial management of Mrs. Josephine Lindley Corella. The growing social and commercial relations between Arizona and the State of Sonora suggested the idea of publishing a paper in Spanish, with occasional articles in English, to serve as an interpreter between the two countries; "a paper that, by endeavoring to destroy old prejudices and explain misunderstandings, shall strive to give both peoples, Americans and Mexicans, a better knowledge of each other." Mrs. Corella, the daughter of Judge Lindley, formerly of Los Angeles, is an intelligent and accomplished woman, well fitted, we believe, to succeed in her praiseworthy undertaking, and we extend to her a cordial welcome and Godspeed.

NOTIFICATION has been received at the Post-office Department that the Republic of Venezuela has become a member of the Universal Postal Union, to date from the 1st of next January.

SILVER in London 53⅜d; consols, 97 15-16; 5% United States bonds, 105½; 4s, 106; 4½s, 109¼.

Growth of Mining Interests.

It is a patent fact that large sums of money have been, and are now being, invested by prudent capitalists of this country and Europe in mining securities, and it is certain that large sums in the future will seek our mines as one of the best investments and well calculated to bring the best returns. The inducement which is now leading capitalists to resort to this species of investment is undoubtedly founded upon the gradual growth of the business as a legitimate industry. The history of every gigantic business, where wealth was to be speedily developed, was cradled in many unfortunate bubbles which operated to the injury of many from a too hasty desire to reap in the present the rewards which the future alone could promise. But experience, that school of wisdom, eventually dispels the glare of mere speculation and, grasping the reality of the scheme, forces into it an element of solidity which belongs to it, and the wild exaggerations engendered in the imagination become things of the past.

According to the records in 1853, $65,000,000 in gold were produced in this country; in 1854 only $60,000,000, and in 1857 only $55,000,000. During three years there is no account of the silver production. Our official records are a blank, our total bullion products are in the most precious yellow metal. In 1858, however, the official estimate is $500,000 for the production of silver and $50,000,000 for the production of gold. In 1859 the silver production was only $100,000, and in 1860 only $150,000. In 1861, however, there was $2,000,000 of silver produced to $43,000,000 of gold, and in 1863, $8,500,000 in silver to $40,000,000 of gold. The proportion of silver has been gradually rising, until in 1873 it reached nearly $36,000,000, while the gold product was a trifle more. In 1878 the silver production was $41,000,000, and the gold production $50,000,000. It will be noticed that in the figures that we have given that the proportion of silver to gold is gradually rising, and no doubt, in the not distant future, the silver product will be larger than the gold product of the country. Indeed, it must be borne in mind that the gold product of the world is decreasing. There is probably less gold in circulation to-day than ten years ago. Indeed gold was always the more fluctuating metal, being more often found in greater quantities, and then the supply suddenly ceasing, but the production of silver in this country, while it had been steadily rising, presents a uniform advance and takes no step backward.

We speak from the records of the past, of course, because we cannot foresee future discoveries, which may cause the balance of metal to fluctuate largely toward the side of the gold product. It is safe, however, to assume our premises as the results of actual experience. Another very important point which is almost a revelation to capitalists, is that mining is rapidly assuming the characteristics of a science in which skill has all to do with the successful and steady development of wealth where chance heretofore has been the guiding star.

The immense and never-ending supply of all the precious metals existing in our midst is a new feature in the business of the world. Of course, mining has always been carried on, but there has existed a vague impression, engendered probably by lack of knowledge, that the supply of gold and silver would become inadequate for the world's needs. But our comparatively recent developments have dispelled this illusion, and the business takes its place in the commerce of the world as the most enduring industry—an industry which will continue for all time, and founded upon that greatest of all foundations when human affairs are considered, universal demand. There is, too, a manifest lessening of distrust in the business, inasmuch as it has been demonstrated beyond a cavil, that it can be carried on properly so as to be relied upon as certainly for good returns as any other business.

The various disasters of trade and commerce, the depressions of business affecting the merchant; early frost and summer drouth destroying the best laid plans of the farmer, are absent in the mining business. The miner can determine accurately whether it will pay to work his mine, and having learned this, he may begin his labor, or make his expenditures without any misgivings.

In placer ground the miner sinks his shafts and prospects the dirt, and carefully examining the whole ground before putting in his flume, he knows how much dirt can be run off in a given time, and can estimate very nicely what every square yard of it will pay.

In quartz the prospector who sinks his shaft and runs his level can, if he is careful, know about how much his ore will pay above all expenses. Of course there may be slips, the placer ground may be unusually spotted, and the value of the sampled and assayed ore may be treated as an infallible guide to the whole. But common sense and discrimination are required in every business, and not less in delving for the precious metals. Nature is not capricious, but works according to rules which are invariable. Breaks and faults in her system are not mere accidents, but the results of other well-known and ascertainable laws. It is true that millions of dollars have been wasted in the erection of costly works upon the strength of mere surface indications, but these are the blunders of incompetency and not the fault of the business. The time has passed we trust when serious mistakes involving great loss will be made.

The Divining Rod Again.

The researches made by science have resulted in the establishment of exact rules for the ascertainment of what exists beneath the soil, whether mineral or fluid, that, so far as the former is concerned, there need not be any mistake if all of the "indications" are carefully studied, examined and compared. Quackery, however, has often, and will undoubtedly in the future, impose upon the unsuspecting, who do not think of comparing the relations between cause and effect. The forked stick called the divining rod has over and over again been explained; yet a greater power is sometimes accorded to this inanimate, unthinking and unreasoning piece of inert matter than would be believed possible, if the facts were unknown. It has been used to find subterranean streams, and we may with certainty say that every individual that places any confidence in the humbug is either interested pecuniarily in it or has accidentally found a water-course where the rod pointed downward. It now comes up in the shape of a gold ledge-finder, notably in the recent development of the San Geronimo mine, in Marin county. The *Journal* says upon the subject: The history of the discovery of this mine is peculiar, and will achieve a wide notoriety if the mine turns out according to its present promise. Mr. Peck is the owner of a miner's divining-rod, whatever that may be. We have talked with several gentlemen who have seen it operate, but neither of them could explain the principle of its working. It consists of a bulb, the contents of which are unknown; this bulb is held firmly between two whalebones, and when carried over an ore-body will be strongly attracted, as a needle to a magnet. Mr. Peck's first intimation of this mine was received from the operation of his divining-rod, while passing it on the cars. Afterwards, going over the ground, he became satisfied that a rich mine existed there. He had great difficulty to enlist capital to open it, and labored about eighteen months before he succeeded. The gentlemen who then took hold of it, Messrs. Higgins and others, commenced their expenditures on the strength of the actual prospect, which was remarkably good, and which has improved steadily through more than a year of active delving in the ledge. The owners are now perfectly sanguine that they have a bonanza, and that in less than another year they will be operating mills on their ledge, and have five hundred men employed. It is said that Mr. Peck discovered, in the same way, a ledge in or near the North Con. Virginia, which he claimed would turn out a bonanza, and it proved true, as the Union Con. testifies.

We have this to say in regard to this divining-rod business:

First—If any essential virtue exists in the forked stick, or whalebone, with or without a bulb, the contents of which might be either known or unknown, it would infallibly act in the presence of any and every mineral vein or subterranean water-course, because it would be its nature to so act, and being inert matter any inherent law is bound to manifest itself when opportunity presents. But it does not possess any inherent virtue for the reason that it does not act even when held over *known* mineral veins.

Second—There is no connection between such an instrument or bulb and mineral veins, and consequently has no *raison d'etre*. If there is any connection between the bulb and the vein it must be one of attraction; and like the magnet would act on every occasion in the same way and make its attraction manifest. But it does not do this. It fails to indicate the presence of well-known veins, as we said before.

Third—The secret of it lies in the power of the human mind over matter. From surface indications, the individual who holds the instrument in his hands, is persuaded that a vein exists, and the nervous ganglia acting upon the human muscles produce a contraction which acts upon the piece of matter held by him. So the divining-rod *turns* only when held by a person who believes he has found the vein. When held by an unbeliever it does not turn. But when it does turn the chances are against finding anything.

Planchette was of a similar nature, the power of the will acting upon the physical system caused the heart-shaped instrument to write his thoughts. It is not the instrument that possesses any virtue, but the influence of the mind which determines the peculiarity of the movement. The divining-rod has been used in the oil regions of Pennsylvania to find oil deposits, and in some localities there, hardly a square rod of ground exists without an underlying deposit of petroleum. So in our mineral regions where the indications are geologically strong, the person holding the rod would become perfectly convinced that there was a vein or ore of some kind, and might turn.

Fourth—If the rod is certain why is it not used to unlock the secrets of nature? Why wait eighteen months for capital to develop one single point in a vast mineral region? And if uncertain as in its nature it must be, then it is worthless, and it would be a delusion to rely upon it.

THE Texas Pacific Railroad Company announces its intention of completing the road without asking for Government aid.

A Thoughtful Government.

The Washington correspondent of the Salt Lake *Tribune*, in a recent letter to that paper, gives an interesting sketch of the secret workings of land claimants. The writer says that under the law of 1850 there was issued from the Interior Department in October 27th last, about 100 military land patents for service rendered in almost every scrimmage in which the United States has ever been engaged. There were patents for services as volunteers and regulars rendered in the wars of 1812–14, Creek war, Cherokee war, Black Hawk war, Florida war, and one for service in "the Indian war," whatever that may mean. He says further: "In looking over these patents I could not find half a dozen in the name of heirs of the soldiers, but they were almost invariably 'duly signed' to somebody else. And another peculiarity was that every acre called for has been located in the agricultural lands of the auriferous State of California." It is very fortunate that the State of California is of respectable dimensions, any common-sized State would long ago have been swallowed up. We cannot say we are sorry that these claims should be located in California, because it affords a proof that we are well thought of. The reason why some of these claims are not plastered on Utah or Colorado, etc., is not given, but we presume that the claimants having already survived several "bloody wars" for the commonwealth, prefer to settle in a peaceable community where there is no discount in scalp. Seriously speaking, however, some of these land schemes are mysterious, for instance:

"Some years ago—just to be definite I will say three—a score, more or less, of men, including attorneys, land agents, etc., entered into a combination to pre-empt as land belonging to the general Government and never disposed of, Dearborn Park, containing 300 or 400 acres, and about one-third also of the city of Chicago. They paid for it in what is officially known as 'Valentine Scrip.' The history of this scrip (and this is important to the story) is, one Valentine owned or claimed to have owned a 'Mexican Grant' of land which the Government had sold as its own. At all events, whether he ever owned such grant or not, he convinced a majority of Congress that he did, which is all the same, and that body passed a law giving him land scrip for the number of acres alleged to have been wrongfully disposed of by Uncle Sam's agent, with the privilege of locating it upon any unoccupied land belonging to the Government. The 'find' in Chicago was a very valuable one; well, there is or was 'millions' in it; indeed several of them, if the claim pans out well. Thus armed and equipped they appeared in due time at the General Land Office, and the then Commissioner, being in amiable and liberal mood, decided in their favor as demanded. Some busy-bodies in Chicago, in a moment of virtuous indignation, appealed the case to the Secretary of the Interior, who reversed the decision of his Commissioner, and for the principal cause that the Valentine scrip could only be used to take unoccupied land. The claimants have gone into the State courts where they will undoubtedly be beaten, but, as they are pretty stiff-necked chaps, and have considerable money at command, the question in dispute is likely only to be determined in the court of last resort—the Supreme Court of the United States."

Even the sacred precincts of the District of Columbia have felt the squatter's power, for not many years ago—it was when Wilson was Commissioner—a citizen with the uncommon cognomen of John Smith, found in this District of Columbia, 30 or 40 acres of Government land for which he put in a claim and got a patent. The land at the time was unoccupied. It now is included within that beautiful suburban place of villas known as Le Droit Park, near the Howard University, where Col. E. C. Ford and 40 or 50 other high-toned gentlemen live and enjoy their *otium cum dignitate*.

It is, in fact, well known to the interested few in Washington, that in every thickly settled State where the Government has ever had any land to dispose of, there are omitted parcels which have never been sold, but are mostly occupied and improved, and which could be pre-empted with impunity.

The law reports are full of cases where parties have been dispossed after years of occupation and improvement, yet they suffer all the consequences of carelessness in not scrutinizing the title to their possessions.

The present aspect of our land laws seems inclined to regard every man as a competent lawyer and expert searcher of records, instead of being an ordinary patriot expecting protection against land sharks. The caveat emptor idea is carried to extremes, and it is to be hoped that some future legislative body will be endowed with sufficient wisdom to prevent the abuses of confidence in land transactions and provide for the bone and sinew of the nation without compelling him to waste his substance in law suits.

New Enterprise in Nevada County.

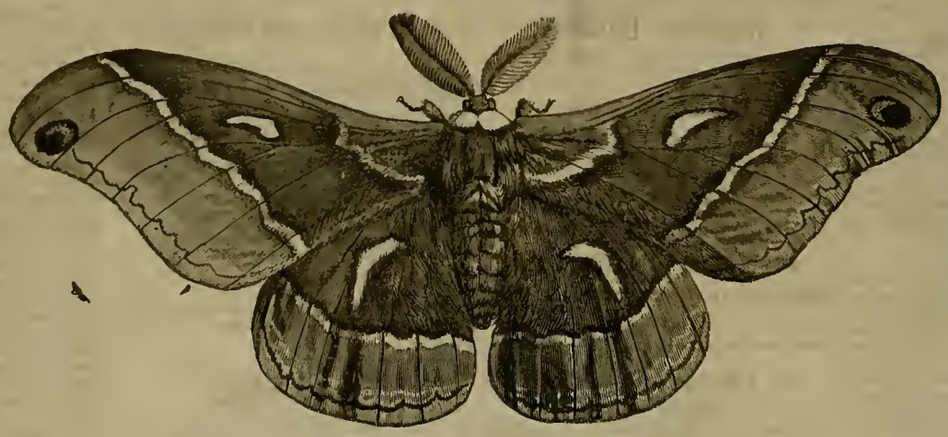
Within the past six months or a year a great deal more interest has been manifested in the development of mines in California, than has been the case for a long time. For several years past our capitalists and mine investors have been running after mines, in other States and Territories, to the great neglect of those nearer home. This has been not only detrimental to California mining interests, but, generally speaking, to the pockets of those who overlooked mines of better worth at home to go to a distance.

In some of the older settled mining districts of the State, old abandoned mines have been relocated or re-opened, and new prospecting shafts sunk and partly prospected claims judiciously worked; and in a large number of cases, the mines thus developed have proved good properties. In Nevada county this has been the case in a number of instances, and scarcely a week passes in which we do not hear of several new enterprises of this character.

The latest of these to which our attention has been called is that of the Surprise Con. G. M. Co., on the Allison Ranch, Nevada county. The claim adjoins the old Hartley ledge on the south, and is supposed to be an extension. The Hartley was worked in early days. The south end was first worked, and money enough taken out to build works at the other end. The shaft at the new works yielded $30,000, but the men who were working on a ten per cent. contract quarreled, and work was given up. The works were soon afterwards burned for the second time. The Surprise comes next this claim on the south, the company having also leased the Hartley, with the privilege of purchase, at a stated price. In the Surprise the shaft was started last May, and after getting down 153 feet the ledge pinched out to nothing on the "bar" or "rim rock." They went through this hard formation for more than 20 feet, when they came on a ledge which in the last four feet widened from nothing to eight inches. This is in the softer character of rock. Another ledge also came in at one side and on top, and of a different character.

The ore in the eight-inch ledge looks like that from the Rocky Bar, but no drifts have yet been run, the shaft being the only development as yet. Two batches of the rock from the upper part of the shaft have been worked, and yielded $25 and $42.50 per ton, without the sulphurets. They have a 24 horse-power engine, hoisting works, cars, etc.

All the ledges in the vicinity of the hill on which the location was made have been rich. The famous Allison mine, the richest in California, is 800 feet west and 100 feet below the ledge running into the hill. They are, therefore, on historic ground, with good surroundings, and it is not unreasonable to expect a good paying mine in their claim; much more so than in an undeveloped and unprospected region. They have passed through the hard rock and into the soft, there finding the ledge, and the company consider they have good prospects. The company has incorporated with a capital stock of 50,000 shares, of which 20,000, at $1 per share, unassessable, have been set aside for a working capital. Frank A. Hill, Manager of the Sweepstake Plow Co. of San Leandro, from whom we obtain the facts concerning the mine, is President of the Surprise Company; S. S. Bird, of Stockton, and Patrick Dillon and John Lundy, of Grass Valley, are also Directors, and well known in this community. They are developing the Surprise ledge, and intend also developing the Hartley at the first opportunity.



THE CALIFORNIA LILAC MOTH—Saturnia Ceanothi.

THE COCOON.

LARVÆ, GROWING AND MATURE.

A Beautiful California Moth.

EDITORS PRESS:—I send you a curious thing which I found on one of the trees on the college grounds. As I like to know all about the peculiar things I discover, I send you this for explanation.—WILLIAM BROWN, Washington College, Alameda county.

The curious thing which our young friend sends us is the cocoon of a large moth. If he is acquainted with the transformation of insects, he knows that the cocoon is made by the caterpillar just before it enters the pupa state, and that next spring, if the insect has not been injured, there will emerge from this cocoon a splendid, large moth, which will lay eggs from which caterpillars will hatch, and these caterpillars, when they have attained their full growth, will again spin cocoons and thus the succession will continue. As these large moths produce but one brood a year, the cocoon may be called the winter residence of the insect.

In order to show the transformations alluded to and at the same time to embellish our journal with engravings of one of our most magnificent California insects, we present on this page the illustrated life history of *Saturnia Ceanothi*. This moth is of the tribe of spinners *(Bombyces)*, the name being derived from *bombyx*, the ancient name of the silk-worm. The genus *Saturnia* takes its name from the surname of Juno, daughter of Saturn, of ancient mythology. The specific name *Ceanothi* is borrowed from the shrub *Ceanothus*, upon which the larva feeds; it also feeds upon the *rhamnus* and rarely on the *hesperomeles*.

The *Saturnia ceanothi* is not found in the Eastern States. Its nearest relative there is *Saturnia cecropia* or *Attacus cecropia*, as it is also termed by entomologists. The *cecropia* is also used as a silk-producing moth, and is being acclimated in France for that purpose. A recent issue of *La Nature* contains accounts of rearing this moth by A. L. Clement. The cocoons were introduced in France at the beginning of 1878 by the Acclimatization Society. To give an idea of how the entomologist loves his pets, we quote from Mr Clement's writing as follows: "I had reared my caterpillars in the open air of my work-room, and they were now about four inches long. One could hardly take a step without crushing them; they were everywhere—in the dining-room, kitchen, parlor, bed-room, closets and even in the beds." The silk from the *cecropia* is very strong, and is expected to produce goods possessing remarkably solid qualities.

The *Saturnia ceanothi* could also be made useful for the production of silk of a heavy, coarse quality. In talking with Dr. Behr, of this city, our foremost entomologist, he expressed a desire to experiment with the silk-producing qualities of our native insect. If any of our readers who may see the cocoons like that shown in the engraving will gather them and send them to us, we will give them to Dr. Behr for experiment, and in due time report the results of his investigations.

Engineering Triumph.

The result of the jetty system of Capt. Eads in the Mississippi has been eminently successful, and the first great ocean steamship to enter the mouth of that river passed over the bar Saturday, November 1st.

The *City of Bristol*, of the Inman line, having a draft, when laden, of twenty-four feet seven inches, entered through the South Pass, and Capt. Eads, whose engineering skill has removed so many of the obstructions which commerce has encountered at the sea-gates of the Father of Waters, is not the one who will rejoice most or longest at the event. The triumph belongs most of all to New Orleans, a city which must see in the advent to her wharves of the first great ocean steamship a sure promise of that commercial importance which direct communication with European ports can not fail to yield her. And, through the hands of New Orleans, great steamships must soon bring across the ocean the wealth of foreign lands with which to make glad the vast regions beyond, and the whole Mississippi valley might well have rung with shouts of welcome as the *City of Bristol* swept through the channel from the sea. The event to which we direct attention is made especially conspicuous as an indication of that marvelous development which awaits the South.

To the Pacific coast the event is fruitful of beneficial results, and the benefits to be derived from the opening of New Orleans as an ocean port will be more apparent when its connection with San Francisco is considered. We have always understood that ocean freight was as low from New Orleans to European ports as from the Atlantic cities, and hence the odds are very much in favor of New Orleans by many hundred miles less of railroad freightage. Our mines and mineral resources will receive fresh impetus, and developments will be encouraged by the fact, that transportation can be afforded in every direction.

Appleton's Journal quotes a calculation by Berthelot, the eminent French chemist, of the number of combinations which may be made of acids with certain alcohols. He says: "If you give each compound a name, and then print 100 lines on a page, and make volumes of 1,000 pages, and place a million volumes in a library, you will want 14,000 libraries to complete your catalogue."

THE steamship *Gallia* arrived in New York from Liverpool, and brought $550,000 in British gold bars and American gold coin. The *Westphalia*, from Hamburg, brought $1,300,000 gold coin in 20-franc pieces.

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Foreign Patents.

In addition to American Patents, we secure, with the assistance of co-operative agents, claims in all foreign countries which grant Patents, including Great Britain, France, Belgium, Prussia, Austria, Baden, Peru, Russia, Spain, British India, Saxony, British Columbia, Canada, Norway, Sweden, Mexico, Victoria, Brazil, Bavaria, Holland, Denmark, Italy, Portugal, Cuba, Roman States, Wurtemburg, New Zealand, New South Wales, Queensland, Tasmania, Brazil, New Granada, Chile, Argentine Republic, AND EVERY COUNTRY IN THE WORLD where Patents are obtainable.

No models are required in European countries, but the drawings and specifications should be prepared with thoroughness, by able persons who are familiar with the requirements and changes of foreign patent laws—agents who are reliable and permanently established.

Our schedule price for obtaining foreign patents, in all cases, will always be as low, and in some instances lower, than those of any other responsible agency.

We *can and do* get foreign patents for inventors in the Pacific States from two to six months (according to the location of the country) SOONER than any other agents.

The principal portion of the patent business of this coast has been done, and is still being done, through our agency. We are familiar with, and have full records, of all former cases, and can more correctly judge of the value and patentability of inventions discovered here than any other agents.

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We invite the acquaintance of all parties connected with inventions and patent right business, believing that the mutual conference of legitimate business and professional men is mutual gain. Parties in doubt in regard to their rights as assignees of patents or purchasers of patented articles, can often receive advice of importance to them from a short call at our office.

Remittances of money, made by individual inventors to the Government, sometimes miscarry, and it has repeatedly happened that applicants have not only lost their money, but their inventions also, from this cause and consequent delay. We hold ourselves responsible for all fees entrusted to our agency.

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We have superior artists in our own office, and all facilities for producing fine and satisfactory illustrations of inventions and machinery, for newspaper, hook, circular and other printed illustrations, and are always ready to assist patrons in bringing their valuable discoveries into practical and profitable use.

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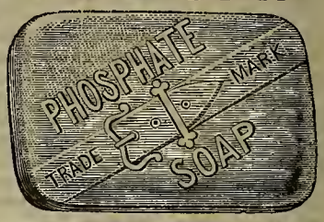

THE BEST soap for toilet use ever manufactured. BEST because it contains all the excellencies of the most expensive foreign or American soaps without their defects. BEST because it combines strength with delicacy in such a way that its strong detersive qualities do not injure the skin. BEST because it is the result of years of study and experiment in the soap manufacturing business, assisted by modern chemical discoveries. BEST because it contains ingredients beneficial to the skin, which unite chemically with the soap in such a manner as to increase its saponaceous qualities. Every chemist familiar with soap manufacture knows that some ingredients which are in themselves beneficial to the skin cannot be saponified; some are partially neutralized, while others injure the quality of the soap. There are soaps in the market which are to some extent beneficial to the skin, but they are inferior articles for toilet use. PHOSPHATE SOAP is the ONLY article offered to the public which combines all the best elements of toilet soap with medical ingredients beneficial to the skin.

If your wife is in the habit of using cosmetics of any kind, advise her to give up the pernicious practice, as the most harmless face powders obstruct the pores of the skin and sooner or later injure the complexion, while PHOSPHATE SOAP removes all impurities and assists nature in developing a natural, healthy and beautiful skin.

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Under the heading of the first chapter, "Testing Ores for Silver," we find paragraphs on ore formation test for silver, with heat and water, acid or blow pipe. In speaking of testing for a process, the extent and richness of ore is considered, smelting ores, selecting and working sample, appliances for testing, roasting, etc. Under the head of "Working Ores" the author describes Aaron's process, has something to say of superheated steam, preparation of dichloride of copper and protochloride of copper, use of copper and iron, quantity of chemicals, carbonate of lime, chloride ores, amalgam, Patchen's process, etc. He also describes the methods of working roasted ores, treatment of base metals, stirring, heat of furnace, want of sulphur, etc. Under the head of "Leaching Processes" are the titles, Smelting, Mexican process, Chilean process, Kroehnke's process, etc. Under "Pulverizing Machines" are described the arastra and its construction and operation, stamp batteries, screens, Crocker's trip-hammer battery, Paul's pulverizing barrel, Kendall's battery, Noice's pulverizer, a cheap rock breaker, etc.

In speaking of amalgamators the author describes a cheap amalgamator, grinding the ore, directions for making a barrel, preventing mechanical wear, use of quicksilver, copper in bars, Freiberg barrel, cheap barrel trough, barrel on rollers, Aaron's amalgamator, separator, etc.

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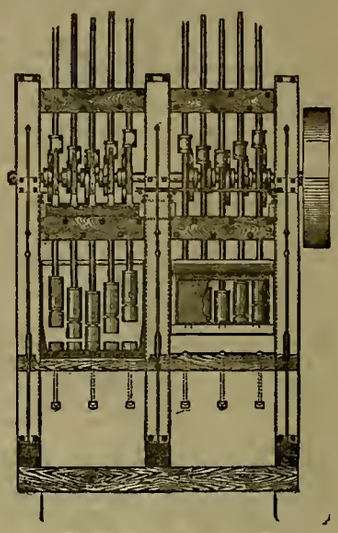

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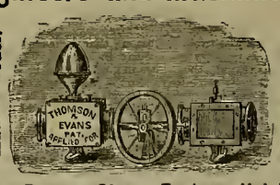

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CONTINUED FROM PAGE 309.

Deideshelmer, the Superintendent, and was shown some specimens. He says: The formation is certainly a promising one. The crosscut is six ft in this ore. The ore contains black sulphurets and chlorides, with spots of stephanite. The outside of the specimen uncovered is covered with fine rich chlorides, and much of the ore seen in the paper is fine soft chlorids. There is no hesitancy in saying that the whole as shown would mill $100 per ton, while selections could be made which would go high in the hundreds. The situation on Wednesday showed the face of the cut still in the ore vein. The crosscut on the 2200 level is being prospected by the diamond drill as a precaution against water. Its total length is 24 ft.

MEXICAN.—The north drift, 2300 level, has been extended from the Ophir incline into Mexican ground, and will be continued on to intersect with the joint Union winze on this level. It is now in a very favorable vein formation, carrying low-grade ore, and a similar, if not the same, formation has been encountered in the joint Ophir crosscut west on this level.

SIERRA NEVADA.—The workings both north and east from the bottom of the east shaft are abandoned on account of water, as the mine has all that it can possibly handle with the amount of compressed air at command, and both drifts are secured. All is being done to open up the 2400 station of the incline that can be, and the work is progressing well.

CON. VIRGINIA.—There remain some 200 ft yet to be made between the south drift, 2150 level, and that north on the same level from the foot of the joint Best & Belcher winze from the 1900 level.

PIOCHE DISTRICT.

RAYMOND & ELY.—*Record*, Nov. 8: Everything looks well on 1000 level; winze looks well and plenty of low-grade ore. Mill started up yesterday. Mr. Kilburn is progressing very well in grading and getting ready to put roaster in position when it arrives and has many men to work; have plenty of black ore on hand when furnace starts; have on hand now about 400 tons of ore here and at mill; 8th and 9th levels look well and promising; on 11th future prospect very encouraging.

HILLSIDE.—This mine is at present working well and taking out its 50 tons of ore daily. The stopes producing their usual quantity of ore. The vein in the intermediate drift at extreme east, fourth level, continues good and the ore gaining in lead. The west ore body on fifth level still holding its own, the two winzes being sunk on it still showing the same character of ore and giving averags assays. The upraise drift above the central ore chamber has been run some 60 ft, continuing in the same quality of ore.

MAYFLOWER.—The Superintendent says: Commenced drifting west in the ore in bottom of winze at a depth of 114 ft; total depth from surface, 244 ft. Have extended drift 11 ft since November 1st. The ore encloses the whole drift; no lime in sight. Shall push this drift for 40 ft, then crosscut both winzes, to find out the extent of the ore body. As the drift is being pushed forward the ore continues to improve in quality.

PARADISE DISTRICT.

RICH ORE.—The *Silver State* of Winnemucca says: Charles Kemler brought a piece of ore from the new discovery of Graves and Nace, in the Paradise mountains, some six miles west of the village, to this office to-day. It is one of the finest specimens of ore we have yet seen from the Paradise mines. The ledge, from the croppings of which it was taken, is four ft wide, and the ore assays from $200 to $2,000 per ton. Mr. Kemler sends the specimen to Charles Forman, a prominent mining man of Storey county, this afternoon.

WILLOW CREEK DISTRICT.

PROSPECTING.—*Silver State*, Nov. 8: There is considerable activity among prospectors on Willow creek, not far from McColley's station, on the Idaho road. Very rich silver-bearing quartz has been found on the surface of the ground, and prospectors are diligently searching for the ledge from which it floated. The late mining discoveries on the east or Paradise side of the range, which divides Paradise valley from Willow creek, encouraged prospecting on the west side, where very rich float rock has been found. There are evidences of rich mines on both sides of the mountain which bounds Paradise valley on the west, and rich strikes are liable to be made there any day.

SANTA FE DISTRICT.

RICH DISCOVERY IN ESMERALDA COUNTY.—The Reno *Gazette* of the 10th inst contains the following from its own correspondent: "A very rich discovery was made a few days ago by a prospector named Wm. J. Morris. The ore is a black sulphuret, galena and antimony. The rock was taken from the surface, and several assays were made ranging from $2,200 to $2,926. The vein is 22 inches wide, and in a limestone formation. It is pronounced by old prospectors to be the greatest discovery ever known. Work will be commenced on it immediately. It is about five miles from the famous Sunrise mine, in a northern direction.

ARIZONA.

CONTENTION MINE.—The *Citizen* says there is a report in Tucson just from Tombstone that a marvelously rich strike has recently been made in the Contention mine, the ore assaying about $900 in gold and up in thousands in silver. By some this report is thought to be based on the fact that some two weeks ago a strike was made that Mr. Dean said would, if on the Comstock, add a million dollars to the value of the mine.

A NEW DISCOVERY.—Mr. James Lee and others discovered a ledge of mineral some eight days ago, situated about 40 miles from Tucson in the Santa Catarina mountains. An assay was made of an ordinary piece of surface rock which gave a result of $80.43 in silver and $201.50 in gold. A choice piece gave an assay of $1,300.

ITEMS.—The *Herald* says: Sam Hill, returned from Tonto basin last week, brought 20 pounds of ore from the Zulu ledge, which he had Blake & Co. assay, and the result shows $314 silver and $97.80 gold. The ledge is between four and five ft wide. Mining news from Mohave county is encouraging. The creditors of the McCracken company will run the mill until they get their money, after which the company will run it themselves. The Signal mill is running steadily.

ANCIENT MINING TOWN.—The *Sentinel* publishes the report of the finding, at Tucson, of a mining town in Papago country, southwest of Tucson, not heretofore known to the whites. It created much talk, and it is thought that rich mines are near there.

COLORADO.

ITEMS.—Georgetown *Courier*, Nov. 6: Ore from the Tilden lode mills from 100 to 1,000 ounces. The Mammoth mine, Sherman mountain, is being worked by Chas. H. Loring, lessee, who is working on a vein of galena ore from three to six inches thick, that mills about 40 ounces in silver, and 50% lead. The ore is shipped to Boyd's smelting works, at Boulder. The lessees of the Magnet mine, on Saxon mountain, are stoping and raising on a vein of ore about six inches thick, which is worth about 400 ounces per ton. Vaughn & Co. are drifting and stoping in the upper level, on from one to two inches of ore that mills from 500 to 600 ounces.

PAY ROCK MINE.—The North Branch, a vein of ore which branches from the North vein, is in excellent pay at the Pay Rock tunnel level, the Silverbank tunnel level and at the first level, 85 ft below the latter, making a distance of 172 ft perpendicular which contains good pay, and at each of the places where it is worked the ore is of a uniform grade, milling from 700 to 800 ounces per ton. The best pay at present on this vein is at the Silverbank tunnel level, where the vein is from six to eight inches thick and solid. On the 1st level the vein was intersected by a crosscut 50 ft long, which was run from the north vein at a point 80 ft east of the tunnel—at this point the crosscut has not yet reached the north wall of the lode. At the point where intersected the lode shows six ft of crevice with stringers of ore scattered through it and three veins of solid ore ranging from one to two inches in thickness. A drift will soon be started at this level, both east and west, as the indications point to a large body of ore not far from the head of the crosscut.

IDAHO.

COAL DISCOVERY.—*Statesman*, Nov. 4: We have it from parties every way reliable, but who are unwilling that anything definite shall be made public yet, that a large and valuable vein of coal has been discovered in the vicinity of Boise City. At a depth of 10 ft on the vein, the coal is very nearly pure and of the kind known as semi-bituminous.

MONTANA.

PENOBSCOT MINE.—A writer in the Butte *Weekly Miner* of the 4th inst. says of this mine: The ore vein at the bottom of the shaft is nine ft wide. Stoping has been done on some of the upper levels, but most of the ore is laying on the stulls awaiting to be hoisted to the surface. Several hundred tons of broken ore are lying in the drifts. About 400 ft west of the main shaft a short crosscut taps the vein; from this point a drift has been run west 336 ft, tapping the bottom of the old Snowdrift shaft, or discovery shaft of both the Penobscot and Snowdrift lodes. A little east of the bottom of the old Snowdrift shaft a winze was sunk 90 ft and some very rich ore found, almost equaling the famous bonanza which first brought the mine into such notice two years ago. On this level a vein was found running north and south, or at right angles to the Penobscot. A drift has been run on this lode 100 ft; a good vein of ore three and a half ft wide was found all the way. The spare running out from the vein show to a practical miner that the Penobscot is a true fissure. One thing is noticeable, that the farther away from the rich surface pocket the workings are the less base the ore is, and the higher percentage of the noble metal can be saved. Only a small streak of the black or carbonate ore is found in the deepest working, the rest of the quartz being nearly white and quite free from any base metals.

NEW MEXICO.

GENERAL ITEMS.—A correspondent in the *Grant County Herald* writes of the mines at Georgetown: There is a great deal of very good ore coming out of our mines just now. The McGregor mine alone has about 100 tons of $200-ore on the dump, ready for the mill. Alexander and Malcolm McGregor have just sent down to the Mimbres M. M. & R. W. about 30 tons, which they think will mill near 200 ounces per ton. The ores are very free and generally high grade. The McNulty mine has recently been turning out considerable ore, under the superintendence of Col. Ledbetter. It has a porphyry wall running its whole length, and is supposed to be a true fissure vein, just as the Nalad Queen, which is an extension of the same mine, is now showing itself to be. Messrs. Meredith and Ailman are sinking in the Nalad Queen, and, at a depth of more than 200 ft from the surface, have a vein of very rich ore; over two ft wide, going down along the lower side of the wall, besides several rich streaks, pockets and feeders at various parts of the mine. There are now in store about 20 tons of first-class ore which will run 50 cents per lb. More than enough second-class ore is taken out daily to run the mill. The Satisfaction mine has been turning out considerable ore of late, a large amount of which has been sent to the Lone Mountain mill for reduction. Some of this was low grade, other of very good quality. Our mills have been crowded to their utmost capacity for months past, and still we have 300 tons of ore now in waiting to be reduced. We need more milling capacity very badly.

Recent Decisions by the Commissioner of Patents.

Process of Making Drop Shot--Ex-parte Wintherlich et al.

Decided August 26th, 1879. Interlocutory appeal from the Primary Examiner.

1. A machine and its product cannot be joined in one application when they constitute different inventions; but when, being inseparable in their nature, they constitute one and the same invention, they may be so joined.

2. The applicant cannot be required to suggest considerations or proofs which shall establish these relations between the machine and the product beyond the possibility of reasonable doubt. It is enough if the reasons on which be bases his claim that the two are inseparable, overbalance the opposing reasons in the judgment of the tribunals having jurisdiction of the case.

3. These reasons may be suggested by the laws of nature or by the testimony of witnesses. In cases of evident conflict between the two the former must, of course, prevail.

The decision of the Primary Examiner is affirmed.

Manufacture of Rakes—Ex-parte Carter.

Decided August 26th, 1879. Interlocutory appeal from the Primary Examiner.

1. In an application for a process patent, every stage or sub-process distinctly claimed, which is capable of illustration by drawing, must be illustrated; but it is not, in general, necessary to illustrate by drawings the several steps in each stage of a sub-process claimed.

2. Where the applicant claims as a single sub-process, the bending of a rake and the finishing of the shoulder at the junction of the shank and rake-head, it is not necessary for him to illustrate by drawing the blanks with the shank bent, but not compressed or finished about the head.

3. If a drawing of dies used in a sub-process can fairly be regarded as essential to such a description of the sub-process as will enable those skilled in the art to practice the invention, then a drawing must be furnished, although novelty in the construction of the dies may not be claimed.

The decision of the Primary Examiner on both these points is overruled.

Knit Fabrics—Ex-parte Chase.

Decided August 26th, 1879. Interlocutory appeal from the Primary Examiner.

A drawing is required by Rule 18 and by Section 4889 of the Revised Statutes when the nature of the case admits of it; and a claim for an article of manufacture must be accompanied by a drawing of the article, whether such drawing be or be not necessary or useful in the examination of the case.

The decision of the Primary Examiner is affirmed.

Actiengesellschaft Apollinaris-brunnen vs. Saratoga Seltzer Spring Company.

Decided August 26th, 1879. Appeal from the Examiner of Interferences.

Motion to re-open Interference.

1. The effect of Sections 1750 and 4905 of the Revised Statutes is to authorize the Commissioner of Patents to establish rules for taking depositions before United States Consuls in foreign countries. There is no authority for taking depositions in interference cases. These statutory provisions do not execute themselves, nor provide for their own execution otherwise than through rules to be established by the Commissioner.

2. The rules for taking depositions in interference cases, now in force, do not apply to foreign countries.

The decision of the Examiner of Interferences is affirmed.

U. S. Circuit Court, Northern District of New York.

Garretson vs. Clark, et al.

Decided September 3d, 1879.

1. Where the entire value of the whole machine as a marketable article is properly and legally attributable to the patented features, the profits may be estimated by showing the profit derived from making and selling the articles containing the patented features, and the profits realized from the manufacture and sale of other forms of the same article not embodying the patented features.

2. The burden is on the plaintiff to lay a basis by evidence for ascertaining the proper profits or damages, and it is not the province of the master nor of the court to suggest any specific line of proof as proper or necessary.

The prayer of the petitioner for a rehearing is denied with costs.

U. S. Circuit Court, Northern District of New York.

News in Brief.

BISMARCK'S illness continues serious.

THE Emeror's troops in Turkestan have mutinied.

PISAGUA, Peru, has been captured by the Chileans.

THE Mint rate for silver has been advanced to $1.15 per ounce.

PAUPERISM is greatly increasing in Ireland, especially in Ulster.

ALL the eastern provinces of Cuba are overrun by insurgents.

GERMANY and Russia are now engaged in an *entente cordiale*.

A RUSSIAN force is marching against the Tekke Turcomans.

IT is reported that a revolution has broken out in Lima, Peru.

ABDUL KADER, the famous Algerian Chief, died at Damascus, aged 72.

A STEAMER is aground in the Suez canal, causing a suspension of trade.

A TERRIBLE tornado occurred in the interior of Missouri Saturday last.

EMPEROR WILLIAM sent £500 to the sufferers by the floods in Murcia, Spain.

WASHINGTON is making extensive preparations to receive General Grant.

SINCE the 1st of January 24,993 German immigrants have landed at New York.

THE Republican National Committee will meet December 17th at Washington.

THE French revenue so far this year exceeds the estimates by 123,000,000 francs.

A. H. STATHAM, of Fresno, has raised a remunerative crop of cotton this season.

THE Russian papers are growling at England and an uneasy feeling is generating.

IT is declared that a financial and political catastrophe is imminent in Constantinople.

MARSHAL CANROBERT, the Bonapartist elected to the French Senate, obtained 316 of the 499 votes.

DR. LOVICK PIERCE, the father of Methodism in Georgia, died at Sparta, in that State, last Tuesday.

THE subject of building the St. Louis and San Francisco Railroad is being revived at the former place.

W. H. JESSUP has raised a large crop of excellent tobacco on his farm near Haywards, Alameda county.

PEARL millet is considered the best of the new forage plants by the farmers of Orange, Los Angeles county.

T. B. JANES, Superintendent of Public Instruction, of Storey county, Nevada, died at Reno, the 11th inst.

THE short time labor movement at Oldham, Eng., which has lasted eight weeks, shows signs of breaking up.

AT Liverpool wheat is quoted at 10s 9d to 11s 6d for average California white, and 11s 6d to 11s 10d for club.

PARNELL'S departure for America has been postponed in consequence of the aspect of political affairs in England.

Two tribes in Morocco recently had a desperate conflict, in which 190 were killed on one side and 90 on the other.

THE whaling schooner *Florence* has been wrecked in Cumberland straits, to the east of Hudson bay.

THE Indians at Williams Lake, B. C., are said to be starving, and their chief has published a pathetic letter in their behalf.

THE Treasury Department the other day purchased 530,000 ounces of silver for the Philadelphia and San Francisco Mints.

THE attempt to raise the German ironclad *Grosser Kurfurst*, sunk in the British Channel, has been postponed until the 24th inst.

THE Arizona troops who recently pursued Victoria's Apaches in Mexico have returned, having driven the savages 60 miles from the border.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

VALVE MECHANISM FOR DIRECT ACTING ENGINES.—Geo. E. Dow, S. F. Patented November 4th. The object of this invention is, first, to provide means for a better distribution of steam to the engine, to facilitate the motion of the piston, combined with a more economical use of the steam, and to apply particularly to the better control of engines having heavy reciprocating parts, thus making the change of stroke easier, yet bringing the piston closely to the cylinder-heads under all conditions, while thumping would be impossible. Second, in order to successfully accomplish the above the main valves of the engine must be moved by and under the immediate control of the main piston from a point somewhat later than the half-stroke. This device must have the elements of first equalizing the pressure by opening a communication between the two ends of the supplementary piston (the same being required to move the valves the latter part of its stroke), then to move the main valve by a positive movement, at first very slowly; but its motion must accelerate rapidly as the main piston approaches the end of its stroke, to the extent of opening rapidly in advance of the piston at a speed equal to or in excess of that of the main piston. Third. That an auxiliary valve must be connected to this mechanism to act the part of opening a communication between the two ends of the supplementary piston just before the action of moving to close the main valve; also, to admit steam to that end of the supplementary piston toward which the main piston is moving, just before the main valve has reached its lapped position or center of travel, and at the same time open a passage from the opposite end to the exhaust. This determines the length of the stroke, and reverses the engine by completing the latter half-stroke of main valve by steam from the steam-chest, though this movement of reversing may be accomplished in part or wholly by the engine itself at any speed in excess of that dependent upon the auxiliary valve for reversing.

FASTENING LASHES TO WHIPS.—John J. Fowler, Ukiah, Cal. Patent No. 221,226. Dated, Nov. 4th, 1879. Whip-lashes are usually secured to the stocks by means of a loop on the end of the lash and one on the end of the stock. The loop on the end of the stock is generally lashed on with waxed thread or twine, and very frequently slips off. It is a troublesome job to secure the loop to the smooth end of the stock, so that it will remain securely, and when it comes off, as it often does, must be replaced before the stock can be again used. This invention is designed to secure this loop to which the lash is fastened firmly to the whip-stock, and have it at the same time easily removable in case it should break. The improvement consists in slipping over the loop on the end of the stock a clamp with a threaded exterior, over which screws a thimble which presses the split parts together against the tapering end of the whip-stock, so as to firmly secure the loop to which the whip-lash is fastened. In this way the loop may be securely fastened to whip-stocks so that there is no danger of losing lashes by the loop slipping off.

AMALGAMATORS.—Aurelius T. Ladd, S. F. Patent No. 220,978. Dated, Oct. 28th, 1879. This invention relates to certain improvements in that class of amalgamators in which the ore is forced through a bath of mercury in a bowl or tank; and the improvement consists in pipes perforated on one side and placed in the bowl in such a position that water injected through the perforations will spread and break up the lump of ore and prevent it from packing or settling. The water which is thus admitted to the bowl dispenses with the necessity of the use of stirrers, and keeps the pulp in such a state that the particles of quicksilver and gold can readily settle, while the tailings pass off freely over the edge of the bowl and are carried away by an encircling inclosed trough.

HINGE FOR DOUBLE DOORS.—Joseph Decombe, S. F. Patent No. 220,965. Dated Oct. 28th, 1879. This invention relates to certain improvements in hinges, which are especially applicable to double doors; and it consists in a peculiar and novel construction in which two leaves of the hinge, one for each of the two doors, are supported upon the same hinge-pin, the latter being projected out from the point at which the hinge is secured the thickness of the doors, thus enabling the doors to be hung so that the post is reduced to a minimum, and is entirely concealed from the front when the doors are closed. When opened only the thickness of the two doors as they stand front to front will be exposed.

New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's office at San Francisco:

AURORA M. CO.—Object: To operate in Placer county. Capital, $270,000. Directors—H. C. Ladd, George L. Ladd, P. Conklin, J. C. Dessenslary of San Francisco, and E. G. Spencer of Iowa Hill.

FRESNO RAISIN & FRUIT CO.—Object: To cure and preserve fruits and vegetables. Capital, $250,000. Directors—A. J. Ralston, Josiah Belden, Oliver Holden, S. A. Miller and N. K. Masten.

CENTRAL GARDENS ASSOCIATION.—Object: To acquire lands for places of amusement. Capital, $500,000. Directors—R. T. Van Norden, T. W. Hinchman, S. Solomons, P. B. Nagle, P. H. Blake, H. Casebolt, John Doyle, Milo Hoadley and M. M. Cook.

OUR AGENTS.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. L. THARP—San Francisco.
B. W. CROWELL—California.
A. C. KNOX—Pacific Coast.
S. V. BLAKESLEE—California.
G. W. McGREW.—Santa Clara county.
MILTON KENNEDY.—Kern and Inyo counties.
J. B. BACHELDER.—Shasta County, Cal.
H. H. MESSENGER—Arizona.
THOS. H. MANNING—Nevada, Idaho and Montana Ter.
CAPT. W. H. SEAMENS—Arizona.
M. P. OWEN—Santa Cruz County.
H. E. HALLETT—Los Angeles County.

FRESH attractions are constantly added to **Woodward's Gardens**, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

THE MANIGRAPH.—What is claimed to be one of the greatest inventions of modern times is advertised in this issue. Every professional and business man should read the advertisement of the Manigraph. It is endorsed by the highest authority in the country, and if as good as represented no office, counting room or store is complete without it.

INVENTORS, and others interested, will receive DEWEY & CO.'S MINING AND SCIENTIFIC PRESS PATENT AGENCY Circular free on application at this office. It contains 42 pages of hints and information about Patents, Patent Laws, Patent Office Regulations, and how to obtain valid patents.

THE CZAR REVOLVER.—This is said to be the greatest bargain ever offered in fire-arms, and is described as the most "beautiful weapon in the world." The advertisers are represented to us as reliable and able to back up every statement with unimpeachable testimonials.

HOW TO STOP THIS PAPER.—It is not a herculean task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

EXTRA COPIES can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

Chew JACKSON'S BEST **Sweet Navy Tobacco**

METALS.

[WHOLESALE.

WEDNESDAY M., November 12, 1879.

IRON.—	
American Pig, soft, ton	28 00 @35 00
Scotch Pig, ton	26 00 @30 00
American White Pig, ton	25 00 @— —
Oregon Pig, ton	28 00 @35 00
Refined Bar	4 @ 8
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 8
Norway, according to thickness	7 @ 8
COPPER.—	
Sheathing, ℔	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, ℔	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @ —
TIN PLATES.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft, 7 to 10, ℔, less than cask	9½@— 10
NAILS.—	
Assorted sizes	3 50@4 50

LUMBER.

WEDNESDAY M., November 12, 1879.

CARGO PRICES OF REDWOOD.		REDWOOD. RETAIL PRICE.	
		Rough, M	15 00
Rough, M	12 00	Pickets, Rough	15 00
Rustic	18 00	Pointed	16 00
do. No. 2	14 00	Fancy	22 50
Flooring	20 00	Siding	20 50
do. No. 2	13 00	Surfaced & Long Beaded	30 00
Beaded Flooring	23 00	Flooring	25 00
Refuse	13 00	do. No. 2	17 00
Half-inch Siding	16 00	Rustic, No. 1	25 00
Refuse	14 00	do. No. 2	18 00
Half-inch Surfaced	20 00	Battens, lineal ft	
Refuse	14 00	Shingles M	2 00
Half-inch Battens	16 00	**PUGET SOUND PINE** RETAIL PRICE.	
Pickets, Rough	11 00		
Rough, Pointed	12 50	Rough, M	15 00
Fancy, Pointed	18 00	Fencing	15 00
Shingles	1 75	Laths	3 50

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, November 12, 3 P. M.

SILVER, ¼.
GOLD BARS, 890@910. SILVER BARS, 10@18 ℘ cent. discount.
EXCHANGE on New York, 20, on London bankers, 49¼@49¾. Commercial, 50; Paris, five francs ℘ dollar; Mexican dollars, 92.
LONDON Consols, 97 13-16; Bonds (4%), 106¼.
QUICKSILVER in S. F., by the flask, ℘ lb, 40@42½c.

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending November 11, 1879.

Nov. 5	Nov. 6	Nov. 7	Nov. 8	Nov. 9	Nov. 10	Nov. 11
HIGHEST AND LOWEST BAROMETER.						
80.237	30.239	30.181	29.967	29.580	39.138	30.150
30.136	30.147	30.063	29.766	29.253	29.799	30.073
MAXIMUM AND MINIMUM THERMOMETER.						
64	65	59	57	56	57	57
53	54	51	52	51	47	52
MEAN DAILY HUMIDITY.						
84.3	61.7	49.7	84.7	75	74	78
PREVAILING WIND.						
SE	W	W	SE	SE	SW	W
WIND—MILES TRAVELED.						
171	145	312	257	394	235	198
STATE OF WEATHER.						
Cloudy	Fair.	Fair.	Cloudy	Rainy	Clear.	Fair.
RAINFALL IN TWENTY-FOUR HOURS.						
.03	.14		.07	.94		.05

Total rain during the season, from July 1, 1879, 2.04 in.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Alpha Hydraulic Gravel Mining Company.

Location of principal place of business, San Francisco, California. Location of works, Washington Township, Nevada County, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the Second day of October, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
Alexander Girvin	8	1000	$00 00
Mrs. Catharine Girvin	9	1000	200 00
Thomas Redmayne, Trustee	3	500	100 00

And in accordance with law and an order of the Board of Directors, made on the second day of October, 1870, so many shares of each parcel of said stock as may be necessary will be sold at public auction at the office of the company, 216 Sansome street, San Francisco, Cal., on the Thirteenth day of December, 1870, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale. JAMES IRELAND, Secretary.

Office, No. 210 Sansome street, San Francisco, Cal.

Butte Hydraulic Mining Company.—Principal place of business, San Francisco, California. Location of works, Butte county, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 31st day of October, 1879, an assessment of Ten Dollars per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary, at room 3, No. 220 Sansome street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 2nd day of December, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the Twenty-second day of December, 1879, to pay the delinquent assessment, together with the cost of advertising and expenses of sale.

L. L. DENNERY, Secretary.

Office, Room 3, No. 220 Sansome st., S. F., Cal.

Numa Mining Company.—Principal Place of business, San Francisco, California. Location of works, Humboldt County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 23rd day of October, 1879, an assessment (No. 2) of Two Cents (2) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 328 Montgomery St., room 21, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 24th day of November, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 15th day of December, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

DAVID WILDER, Secretary.

Office, 328 Montgomery St., Room 21, San Francisco, Cal.

Land Purchasers' Association.—Location of principal place of business, San Francisco, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 5th day of November, 1879, an assessment of six dollars ($6) per share (being the balance of the 43d installment on the subscription to the stock), was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at No. 641 Sacramento street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 4th day of December, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before will be sold on Saturday, the Third (3d) day of January, 1880, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors. C. S. WRIGHT, Secretary.

No. 641 Sacramento street, San Francisco, Cal.

The Pacific Land and Trust Company.—

Location of principal place of business, 513 California street, San Francisco, Cal.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 1) levied on the Eighteenth day of September, 1879, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Am't.
Benj. Flint	1	100	$125 00
D W F Bisbee	3	100	125 00
E W Steele	4	100	125 00
John A Ledden	5	100	125 00
R P Layton	7	100	125 00
Benj. Flint	16	520	650 00
E P Billings	18	40	50 00
R P Layton	20	1600	2000 00

And in accordance with law and an order of the Board of Directors made on the 18th day of September, 1870, so many shares of each parcel of said stock as may be necessary will be sold at public auction at the office of the Pacific Land and Trust Company, 513 California street, on the 15th day of November, 1879, at the hour of two o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale. WM. ANDREWS, JR., Secretary.

Office, 513 California street, San Francisco, Cal.

Annual Meeting.—Office of the Godfrey Gravel Mining Company.

NOTICE.—The annual meeting of the above named company will be held at the office of the company, 300 California street, rooms 3 and 4, second floor, on Monday, the 1st day of December, 1879, at 2 o'clock P. M. of said day, for the election of a Board of Directors, and such other business as may come before said meeting. Transfer books will be closed on Saturday, 22d day of November, 1879, at 12 o'clock M.

J. M. BUFFINGTON, Secretary.

D. H. TWING, President.

ANNUAL MEETING.

OFFICE OF THE

Hillside Mill and Mining Company,

330 Pine St., room 28, San Francisco,

November 7th, 1879.

The Annual Meeting of the stockholders of the above named Company will be held at the office of the Company, room 28, No. 330 Pine street, San Francisco, California, on Thursday, the Twentieth day of November, 1879, at one o'clock P. M. of said day, for the election of Trustees to serve for the ensuing year, and for the transaction of such other business as may be presented. Transfer books closed November Fifteenth, at three P. M.

F. FRANKENTHAL, Secretary.

POSTPONEMENT.

Diana Mining Company.

The day of delinquency of the above assessment is postponed to November 17th, 1879, and the day of sale to Friday, the Fifth day of December, 1879. By order of the Board of Trustees.

J. T. McGEOGHEHAN, Secretary.

Office, 318 Pine St., rooms 13 and 14, San Francisco.

ANNUAL MEETING.

Napa Con. Quicksilver Mining Company.

The regular annual meeting of the Napa Consolidated Quicksilver Mining Company will be held at the office of the Company, room 7, Safe Deposit Building, 328 Montgomery street, San Francisco, California, on Wednesday, the twelfth day of November, 1879, at the hour of 2 P. M., for the purpose of electing a Board of Directors to serve during the ensuing year, and the transaction of such other business as may come before the meeting. Transfer books will close on Saturday, November 8th, 1870.

WM. W. PARRISH, Secretary.

Office, room 7, Safe Deposit Building, 328 Montgomery street, San Francisco, California.

POSTPONEMENT.—The annual meeting of the above named Mining Company is hereby postponed until Wednesday, the 26th day of November, 1879, at the same hour and place. W. W. PARRISH, Secretary.

Stock Dividend Notice,

OFFICE OF THE

Gila Silver Mining Company,

Room 7, Safe Deposit Building, No. 328 Montgomery St., San Francisco, Cal., October 21, 1879.

At a special meeting of the stockholders of the above named Company, held this day, a Stock Dividend of 20 per cent. was declared, payable immediately, out of the capital stock owned by the Company.

All stockholders are requested to send their stock to the office of the Company before NOVEMBER 24th, 1870, and receive the dividend due thereon.

WM. W. PARRISH, Secretary.

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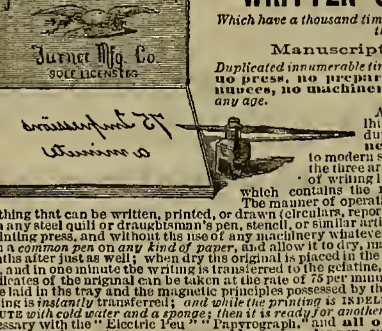

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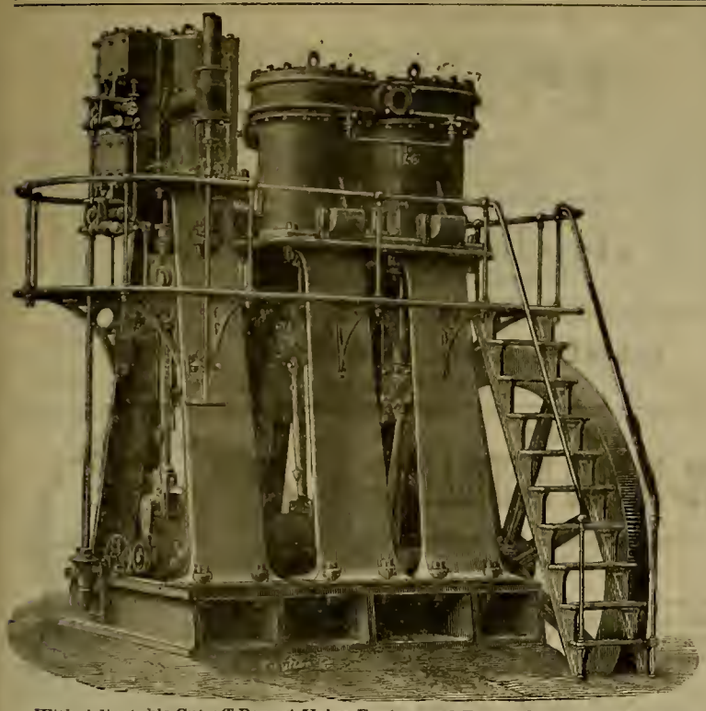

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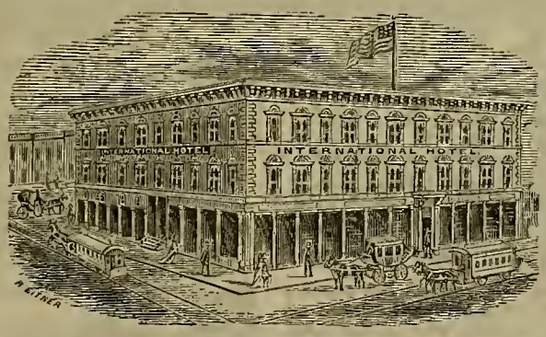

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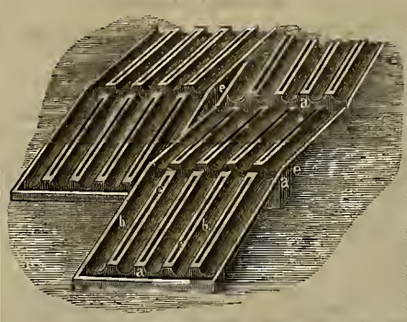
Howland's Under-current, Mill and Sluice Riffle.



This invention meets a want which has long been felt by Gravel Miners and Millmen, viz.: that of a simple, cheap Riffle which will save the largest possible amount of gold or sulphurets, with the least possible waste of quicksilver. That this Riffle answers all these conditions will be apparent to any practical man who takes the trouble to examine it. The arrangement of this Riffle is such that there is a strong, unobstructed upper-current to carry off and break up the gravel or cement, and a slow under-current, checked by numerous riffles, which give gold or sulphurets a better opportunity of settling than if they were exposed to the force of the main current.

In this Riffle there are cast troughs for the quicksilver, which extend entirely across the sluice, and while they are so placed that the current will naturally pitch towards them, and give every opportunity for amalgamation, the quicksilver is fully protected from flouring or leakage. There is no mechanical skill required in taking out or replacing the sections.

Full particulars in regard to this invention can be obtained by applying to

STEIGER & KERR, of the Occidental Foundry, 137 First St., S. F.,

Who have the sole right of manufacturing this Riffle, and who will receive and attend to all orders.

Dunham, Carrigan & Co.,

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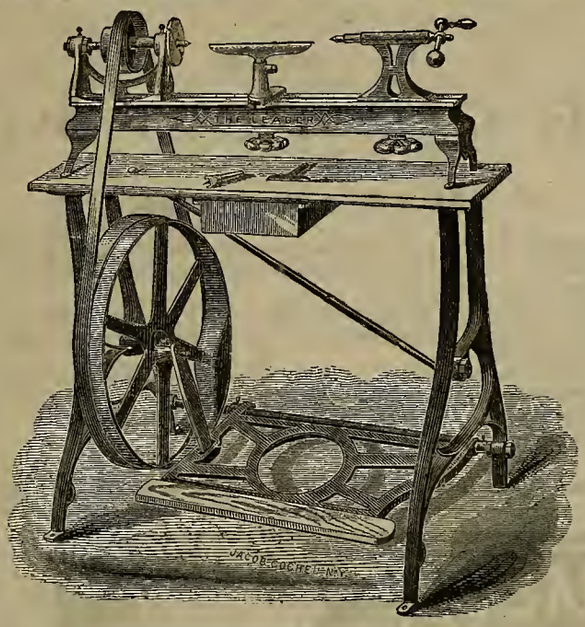
Lathe Without Saw Attachments.

This lathe has been made especially to meet a want felt by many for a really good and substantially made Foot-Lathe at a reasonable price, and we think that we can safely say that it is "par excellence" the best Lathe ever placed on this market at the price asked. The bed, head, and tail stocks are of iron, the spindles of steel. The bearing of the head stock is conical, so that the wear can be easily taken up.



Material eighteen inches long and eight inches in diameter can be turned upon it. The pieces that accompany this Lathe without extra charge are two T rests, two plain centers, one spur center for wood turning, and one face plate.

Price of Lathe without Saw Attachments.....$45. Price of Lathe WITH SCROLL Saw Attachment.....$5
Price of Lathe with both Scroll and Circular Saws, $70.

Trump Drill Chuck.

Chuck for drills ⅜ and under, Price.....$1.50
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They are made on solid steel plug, centered and *readily fitted to Lathe or Drill Press.*
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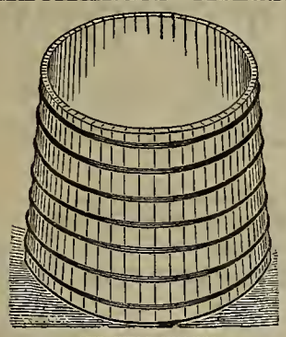

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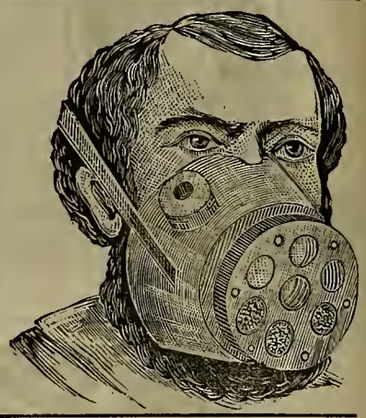

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers. SAN FRANCISCO, SATURDAY, NOVEMBER 22, 1879. VOLUME XXXIX Number 21.

A Heavy Mining Blast.

On Saturday the 8th inst., one of the largest and most successful blasts ever put off in this State was fired at the well-known Dardanelles gravel mine, near Forest Hill in Placer county. About 500,000 cubic yards of hard cement gravel was moved and thoroughly disintegrated by 36,000 pounds of Judson powder. This amount of Judson powder is equal to about 2,900 kegs of common blasting powder. Five drifts with 14 Te, with a total length of 1,200 feet, were run in the face of the bank, which was about 1,000 feet long.

On Friday morning about 40 men began the work of loading and tamping, which was continued without cessation until it was completed, at 10 o'clock on Saturday morning. The powder was put in lots of from 1,000 to 1,500 pounds in 50-pound boxes in 28 different chambers, in each of which was placed three exploders, and each of these was connected by an insulated copper wire with the main wires on the outside of the drifts. These were well tamped with large quantities of clay and boulders. From the mouth of each drift and connected with the wires from the exploders, were run two copper wires to a large electro-magnetic battery, placed on a slight eminence at the right and about 200 feet from the face of the bank.

By ten o'clock on Saturday morning the tamping was all finished. A large number of people had gathered from the neighboring towns of Forest Hill, Todd's Valley and Yankee Jims and the adjacent mines, and were stationed on surrounding eminences at more or less respectful distances from the hidden power. At a quarter past ten o'clock the connections had been made with the batteries. Mr. Wm. McGillivray, the assistant Superintendent, gave a signal that all was ready, turned the crank of the powerful battery, and instantaneously the whole mass of 500,000 cubic yards of cemented gravel seemed to spring into life.

The upper and back part of the mass was thrown upward four or five feet, and the bottom thrown out and forward, and the whole mass came down and spread out loosely, over any part of which one could easily walk. Before the blast the banks stood perpendicular 175 feet. A dense cloud of dust rose from the surface and was soon carried away by the wind.

The jar was felt as strongly as an ordinary earthquake in Forest Hill and Todd's Valley, a mile and a half distant. When we consider that each pound of powder is able to move 14 cubic yards of earth the result seems almost startling.

Two more smaller blasts will be fired in a few days in the same mine. The Dardanelles is now well fitted up for work, and the recent rains will probably fill the Miners' ditch, of some 3,500 inches capacity, and owned by the Dardanelles company, and there is little doubt, with the very rich prospects in the ground to be worked, that they will make some fine clean-ups of bullion during the coming season.

EXPLOSION IN A RAILROAD TUNNEL.—A terrible explosion took place in Tunnel No. 3, near Wright's station, on the South Pacific Coast Railroad, on Wednesday morning, by which 24 Chinamen were instantly killed, and a number of others injured. The cause of the explosion is supposed to have been the ignition of petroleum gases.

THE COLORED people's first industrial exposition opened at Raleigh, N. C., Nov. 17th, with flattering prospects.

GREAT excitement exists in Spain over the renewed insurrection in Cuba, which has assumed an alarming aspect.

THE Nihilist trials have begun at St. Petersburg before a court-martial.

Where to Explore for Minerals.

While it is quite certain that the mine prospector is pretty well acquainted with the geological formation of the region where the precious metals may be looked for, yet those mineral formations which have once been conformable to rule may have become so modified and disguised by volcanic action that original features cannot be recognized, and hence the liability to overlook a rich deposit or excellent vein becomes more common as the divergence from fixed and uniform laws of structure and formation become more varied.

There is one important fact which experience seems to have demonstrated, which is, that the system of fissure veins of extensive and profitable mining districts have been discovered and worked in comparative proximity to the junction of the primitive with the secondary formations, sometimes in the former, sometimes in the latter, and frequently in both strata. Gold and silver, while conforming to this position, appear to require the additional assistance of a partial disturbance, the same power operating to lessen the previous deposits of the volatile base minerals by dispersion. Phillips says, in his "Explorers' Companion," that he has never seen a profitable mine for either lead, antimony, zinc, mercury, or the other very fusible and volatile minerals, within the distance of two miles from any primitive range, but with very few exceptions they are found ranging from this distance to some few miles away. Very small patches of primitive rock, accompanied by the appropriate surrounding conditions, have produced some very extensive ramifications of rich veins, so that very large primitive mountains need not be always present, or comparative mole-hills be despised; for where these latter arise in the congenial clay slates, or in metalliferous carbonates of lime and magnesia, the prospects would be good.

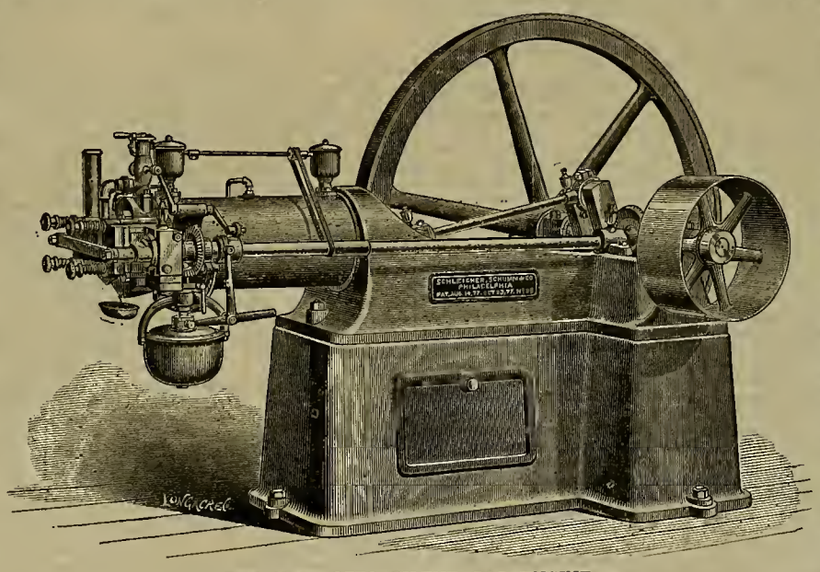
The western slope of the Sierra Nevada is so well situated for climate and proximity to the ocean, and so amply supplied with wood and general provisions, that it will undoubtedly become the most profitable as it is now the most interesting and extensive mining field in the world. The immense deposits of precious minerals are practically inexhaustible. The vast ore veins which are either remaining unexplored or unworked by reason of their low-grade quality, will in the future demand, as they deserve, greater attention as nature's principal and solid storehouses. There has been unsystematic mining, but the experience of the past has demonstrated beyond a peradventure the futility of erecting expensive works before proving the mines.

The day is not far distant when the notion of exploring waste places shall be forgotten, and when mining shall have become the precursor of milling, that the quartz veins of California will be worked as economically as those of Brazil, Australia and New Zealand. The hundreds of ledges now lying unvalued and idle, will be profitably worked, and rich discoveries follow the exploration of these low-grade ore ledges, which are, so to speak, the finger-marks of richer ore. This region has not yet been fully explored. Its capacity as a gold-producer is well known, its indications, geologically speaking, are certain. Silver is easily attainable, gold is the *sine qua non* of the world's market, and exists in our midst in quantities sufficient to remove all fear of any future diminution in the supply. Hence here is the spot which should excite the explorer's energies. Nearly one-half of the entire gold production of the country comes from California. Silver is increasing in quantity, and now exceeds the supply of gold. The proper balance can be preserved by devoting more time to the exploration for gold, and to the solution of the problem of working low-grade ore to advantage. The field is here, the means, however, are yet undetermined; and, as a general thing, exploration remain in many localities *in statu quo*, under the impression that there is nothing more worth working for, whereas the truth is that the rich harvest has hardly begun to be gathered.

A SINGULAR FACT.—Judging from the accounts of gold deposits in Eastern and Southern States, it is quite strange that the precious metal is not dug out. The local papers glow with the richness which exists in the soil, and the Rocky mountain and Pacific slope mines fade into insignificance when compared with the treasure awaiting a resurrection, perhaps. Here is what the Alabama *Times*, of Columbus, says: California and other Pacific States have so long kept the eyes of the gold-hunting world in that direction that the rich veins of the precious metal which run in broad and inexhaustible lines through Alabama have almost been lost sight of. We have often been told by old Californians that with the same machinery and effort, more gold could be taken from the Tallapoosa mines than from many of the most popular ones on the Pacific coast. In former years we knew something of the gold veins of Tallapoosa, especially of those about the once famous Log Pit mine, and can say that they, unskillfully worked, yielded many thousand dollars worth of gold.

A Gas Engine.

We illustrate herewith the Otto Silent Gas engine, a machine which furnishes power by means of successive explosions of common burning gas in the cylinder, thus dispensing with steam, boiler and all the attendant nuisances of the common form of engine. An examination of this engine, which may be seen at H. P. Gregory & Co.'s, shows it to consist mainly of a jacketed cylinder, with piston, slide valve, and governor having a cut-off mechanism to regulate the supply of gas according to the varying load on the engine. The pressure utilized for the production of the power is generated in the cylinder and at once availed of therein to propel the piston. This pressure is due to the combustion of a peculiar mixture of common coal gas, which is ignited by a small flame carried from a burning gas jet outside into the cylinder by the motion of the slide. The principle of combustion in this gas engine is entirely new; a small part only of the charge is combustible, which, on ignition, serves to expand the remainder, thus avoiding shock, and effecting—when compared with other motors of this class—a vast economy. The Otto Gas engine possesses the least number of working parts, and the greatest simplicity of mechanism yet attained in a gas engine. It runs with an extreme smoothness and regularity of speed. The gas engine, requiring no boiler, avoids all the expensive attendance or loss of time, which the watching of water level, feed pumps and steam-pressure gauge demand in a steam engine. The gas flows in freely, and there is no handling of fuel of any kind, and no ashes. Thereby, hardly any item of cost for attendance is to be considered; almost the total expense of running is for the gas alone. The quantity required has, in the Otto engine, been reduced to about one-fourth of what older constructions required, and will average for the different sizes of engines, 21½ cubic feet of gas per inch H. P. per hour. While running, however, the cut-off being in constant operation, the "gas consumption is limited in proportion to the load on engine." Thereby, in practice, in many cases only one-third or one-half of above rate of consumption is reached. The engine costs nothing while standing, and is started and stopped without waste of fuel and time. Another important pecuniary saving is often to be derived from low rates of insurance.



THE NEW OTTO SILENT GAS ENGINE.

FOOTPRINTS OF VANISHED RACES.—Under the above title, Chancy R. Barns, 215 Pine street, St. Louis, Mo., has published an attractive volume, of which A. J. Conant, A. M., is the author. The work refers to the Mississippi valley, and comprehensively treats of the antiquities of the vanished races that once dwelt upon this continent. The preface, giving the results of threescore years of investigation into the antiquities of North America, says: "Notwithstanding all this labor and study, the great questions continually repeated, which were suggested when our antiquities were first noticed, still remain unanswered, namely: Who were the authors of these works? What was their origin, and what were the causes of their disappearance? Were they the redmen found in possession of the continent at the time of its discovery?" The author holds to the opinion that the redmen were not the authors of the most extensive works, and regards the wares of prehistoric America superior to those of Europe. The volume is very interesting throughout, and collates all the facts and researches that have been made in this study, presenting new and well-grounded ideas. The work is of general interest, and treats its subjects in an extremely pleasing and readable style.

PRESIDENT HAYES is visiting New York city.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Nevada Mines.—Esmeralda County.

EDITORS PRESS:—In my travels through the State of Nevada I was surprised to find so many large mines without milling facilities, and I will give you the particulars of the Victor mine, situated at Candelara, Esmeralda county. This property has been so thoroughly prospected as to place it among the best mines of the State. In the past four years there has been expended $100,000 in its development, and have opened a fine body of ore in all the shafts and tunnels. One main tunnel of 700 feet cuts the ledges at right angles, and gives a vertical depth for stoping of 600 feet, with lateral drifts of 800 feet more, exposing a body of rich ore that, from calculation by measurement, reaches the enormous aggregate of 200,000 tons, the average of which, by mill test, was over $50. About 3,000 tons has been hauled a distance of 26 miles to the New Boston mill, and worked with the above result, without roasting, and this has been a fair average of the whole, while much of it would go above that figure under a more economical mode of working, as the assays show a much higher percentage of the precious metals, silver predominating. The silver exists as a chloride in combination with sulphur and antimony; is very easily roasted and worked by the use of salt, of which there is a great abundance in the immediate neighborhood that can be had for a few dollars per ton. Shafts have been sunk on the various ledges, 500 feet in depth, connecting with the lateral drifts, making perfect circulation. These shafts are sunk on the ledge, showing a continuous ore body from the surface to the tunnel. The ledge at the surface shows a width of four to six feet, and increases as depth is reached. In the tunnel I found it from twelve to twenty feet wide.

The ledges are true fissure veins, with foot and hanging rocks, the country rock being slate and porphyry; the direction of the veins running east and west, the range of mountains shows no volcanic disturbance after the upheaval, which insures permanency in the ledges.

The amount of ore on the dumps, as near as could be measured, is about 10,000 tons, which is presumed will mill above $50 per ton, as that is the average of what was milled at Marietta and New Boston. The three claims covered by the surveys and claims, viz., the Victor, the Magnet, and the Chloride, gives ample territory to work from for many years.

The claims lie side by side or nearly so, the Victor extending 400 feet to the east of the other two; the size of each being: The Victor, 1,400x300; the Chloride, 1,000x300; and the Magnet, 1,000x300—giving a width of 900 feet and covering all the ledges that crop out on the surface. The three locations having been made on separate ledges, each of which has been prospected and opened by tunnels and shafts, the amount of development and the quantity of ore in sight makes it one of the most promising properties ever developed. The ledges crop out the entire length of the claims, and are a continuation of the celebrated Northern Belle mine that has paid such large dividends for years; and as there are three claims embraced in this property, it makes it far more valuable than the Northern Belle.

The whole may be summed up in the following particulars: Length of tunneling, 1,800 feet; total feet of shafts, 900; amount of ore exposed in tunnels and shafts, 200,000 tons; amount of ore on dump at time of examination, 10,000 tons.

The improvements on the property at mouth of tunnel consist of one boarding-house sufficiently commodious to accommodate 50 hands, blacksmith shop with complete outfit, and stable for several head of horses.

Considerable of the ore will mill several hundred dollars per ton, but will average about $50. The facilities for mining could not be better, as the ore can all be taken out through tunnels to a depth 1,200 feet, thus avoiding the necessity of hoisting works.

Wood is abundant in the adjacent mountains, and can be delivered at the mine for $10 per cord. The water will have to be brought a distance of 10 miles in pipes, but any quantity can be had from the springs where it is intended to be tapped. The cost will not exceed $20,000, and can be made a source of revenue to the company of $25,000 per annum, as all the water used there now is hauled a distance of 10 miles in wagons, and sells for five cents per gallon. The town of Candelara has a population of about 2,000, and will be largely increased as soon as the water is brought to it.

The weather is pleasant the whole year, or sufficiently so to be able to work outdoors nearly every day. The property is about 100 miles from the C. P. R. R., leaving it at Wadsworth, and a narrow-gauge railroad is in contemplation that will be built within the next year, which will bring this property much nearer to the center of business. In fact, with railroad communication it would be one of the finest properties in the country, as there are millions of tons of fine ore lying there waiting to be converted into bullion. If this property was properly laid before capitalists, there would be no difficulty in getting the amount necessary to erect machinery and bring water to the mine, for it will return the investment many hundred fold. There are many other developed properties throughout that country worthy of mention that I will speak of hereafter. The mill at New Boston some 18 miles away, where the Victor ore was milled, is now putting in an improved roasting furnace, and as soon as ready will start up again on this ore, when they expect to find the ore to return a much larger yield than when worked raw, as much of the chlorides were lost with the slums that ran away in the tailings.

I will give you some particulars of the mines in the vicinity of New Boston in my next, as they are worthy not only of a notice in the columns of your paper, but also the attention of capitalists. J. T. D.

S. F., Cal., Nov., 1879.

Coos Bay.

[Written for the PRESS by F. F. V.]

Coos Bay is an inlet with a mouth like that of a river, and ramifies in many directions, forming narrow sloughs, or bayous, up which tide-water forces itself, making navigation very much dependent upon it. The bar is troublesome and dangerous in the stormy season, needing to be "improved" by the expenditure of money enough to build jetties that would confine the channel between fixed limits, compelling the water to keep the entrance clear. The resources of the country about the bay are sufficient to warrant the appropriation by Government of such a sum, and undoubtedly the day will soon arrive when this work will be commenced.

There is a marked similarity between Coos Bay and the general features of Puget sound, the difference being chiefly in the dimensions. As the Umpqua river is a smaller copy of the Columbia, so Coos Bay is a diminished Puget sound, the wooded shores, the numerous arms and the milling of lumber appearing to reproduce the same effects. So heavily timbered is the country adjacent to its waters that cultivation of the earth is but little carried on, even vegetables and fruits being scarce, while the climate and the soil are favorable enough for their production. This negligence on the part of the settlers sometimes conspires with rough weather on the bar to produce a stringency in the provision market. Last winter, for instance, there were 72 consecutive days when vessels could not come in or go out, and during this period many persons were forced to live on very simple rations, if not on short allowance. It is at such a time as this that railroad projects are discussed with greatest earnestness, and when the people desire something more than a political relation with Oregon.

Coming in from the sea, Empire City is the first town arrived at, and is about three miles inside the bar. It is built on a bench of land, with an incline towards the water's edge below it, and with timbered bluffs extending along the bay above and below it, or, as the bay lies, north and south of it. Opposite to it is a long line of sand hills, forming a barrier against the sea, which from the "lookout" on the bluff is plainly visible. Empire City was founded about the same time with Gardiner and Scottsburg; indeed, all the towns in this region appear to have been started about the same period, from 1850 to 1854. It is a port of entry; is the county seat of Coos; has a shipyard, a large steam lumbering mill, and a considerable trade in general merchandise.

From Empire, one of several small swift steamers conveys us up the bay to North Bend, a distance of two or three miles. This place is entirely a lumbering and shipbuilding point, and is owned by the Simpson brothers. It has a pretty site, is neatly built, has neither hotel nor saloon, but contains within itself all the essentials for the comfort of its people, employers and employed. The mill has a capacity of 28,000 feet per diem. At this shipyard was built the beautiful, full-rigged ship, *Western Shore*. The fine vessel, the *Tam O'Shanter*, was also built at this place. The elegant finishing of these vessels is due in part to the beauty of the cabinet woods of this region, especially of the myrtle, which for color and fineness of grain is not surpassed in beauty by any wood in the world. North Bend has rendered itself famous, and done Oregon good service in sending forth vessels of this class to advertise her resources to the world, as well as the talent and enterprise of her shipbuilders.

A short distance above North Bend, at the head of the bay proper, is Marshfield, the principal town on these waters. It reminds one of Astoria, being situated on a hillside, and having a considerable portion of its business houses built upon piling or "made ground." What its population is it would be difficult to guess—probably about 600. It has good hotels, several stores of general merchandise, and the usual supply of special shops, that make a considerable show of trade; extensive wharves and warehouses, and a general appearance of prosperity. Lumbering is the chief business carried on here, which together with shipbuilding employs in ordinary seasons a large number of men. The present season, however, is less active than any former one for a long time, though the mill of Dean, Wilcox & Merchant is running on full time, its capacity being 40,000 feet per day.

All about Coos Bay on Coos river and the several sloughs are so-called towns; but really they are only small clusters of tenements erected at different points where some enterprise has been undertaken, generally where a coal bank has been discovered and prospected. Where these enterprises have been prosperous, the usual local improvements have been made, and there are schools and stores. But excepting at Newport and Eastport there is almost nothing being done at present in the coal interest. The mines at Henryville, where a large amount of money has been invested, have proven a failure, and the costly works are abandoned. Some coal is being taken out at the Isthmus coal mine, and vessels go to Utter City to load; but the business has so declined that Utter City is almost wholly deserted, and its cottages are empty, while its ample hotel is almost without a guest.

This condition of affairs at Coos Bay is greatly the result of the transient habit of the people on this coast, which affects business everywhere. If there is a rumor that something is doing or may be done at a certain point, everybody rushes to that point. Often they are disappointed and fly with just as little reason to some other point. The people do not adopt the country and determine to make the best of it, but endeavor to drain it as rapidly as possible and get away from it. Business, which has been depressed everywhere alike, will revive by and by, and all the sooner if people instead of floating about the country will stay where they are and do the best they can under the circumstances until the tide turns. At least that is the way it looks to a casual observer like myself.

Coquille City, though on the Coquille river, belongs to the Coos Bay country, and is a promising new town, in a pretty valley, with a navigable river of its own. The inhabitants with commendable enterprise are endeavoring to build jetties at the mouth of the river to keep open the channel and insure navigation. This is done by private subscription and with money raised by entertainments, including a grand Fourth of July celebration, and will I hope prove a permanent good to the country. Efforts of this kind that show the people have come to stay and "mean business," are the results that in time will win the recognition and success that will repay those investing in the work.

Como Lode, Nevada.

The above lode, located in Palmyra district, was referred to in a letter from William Rose to the PRESS, published in our issue of November 1st. Our correspondent in referring to the lode seemed to leave an inference that it was a single lode. The Gold Hill *News* corrects this statement and says Mr. Rose "speaks collectively of the 'Como lode,' as though all those quartz ledges, large and small, lying within the compass of two or three miles were included in one great mother ledge or lode. Mr. Rose may be perfectly correct in his view of it, but the men of 16 years ago who did all the practical mining work that has ever been done in developing the district will hardly agree with him in his hasty, superficial conclusion. There are many promising ledges in the district, some of them large and apparently true fissure veins, which were explored to the depth of from 100 to 200 feet; but nobody was ever able to designate the mother lode of the district. There is a large series of ledges there, considerably varied in character, size and direction, but no main 'Como lode.'"

It says also that the *Graphic* of October 24th contains a similar letter from Mr. Rose, in which he says: "The Como lode was worked from 1862 to 1864, and shows the imperfect mining methods of those days. Recently, proper shafts having been sunk, the results have been brilliant." He then goes on to give rich assays from several different ledges, well known to be totally separate and distinct from each other. Full as good assays were obtained from those same ledges 16 years ago, and as for those "proper shafts," which he says have recently been sunk, the ones he makes mention of—the Eureka, Chieftain and West Rapidan—were sunk, together with all the other shafts in the district, 16 years ago, the only one where deeper sinking or extensive work has been done is the old Monte Cristo, now relocated and being worked under the name of the Eureka. From time to time since the first working and abandonment of the district, 16 years ago, attempts have been made by various parties to work some of the ledges or ores of the district, but without success. This year, however, a more general and concerted attempt is being made, all the ledges are relocated and quite an excitement is created. The relocators of the present day work through the old shafts and openings and have merely taken up the work where it was left off 16 years ago. There are many large and very promising ledges in the district, and if the present owners will proceed with the work as well and actively as did their predecessors 16 years ago, they are almost sure to develop not only one, but several valuable bullion-producing mines.

BLACK SEA CANAL.—The gigantic project for the construction of a canal through the Caucasus, from the Black sea to the Caspian sea, is meeting with great favor in St. Petersburg from those interested in direct commerce from the Black sea with Central Asia.

Nordenskjold's Northwest Passage.

Although the world no longer takes such an intense interest in the northwest or northeast passages as was felt in earlier days, when it was believed that if such a route if found practicable would be a short cut from Europe to the Indies, yet Prof. Nordenskjold's feat represents the solution of a highly interesting geographical problem. This distinguished savant all the more deserves his laurels since from early manhood he has devoted himself to explorations in Spitzbergen, Greenland and the north of Europe. The joyful news lately brought was that Nordenskjold had at last got free from the ice which, since September 28th, 1878, had bound his ship, the *Vega*, off Koljutchin shore, almost within sight of open water, and had arrived with all his crew safe and sound at Yokohama, Japan. During their enforced imprisonment, the Professor and his companions unintermittingly pursued their scientific labors, and have reaped a rich harvest of spoils.

The details of the expedition are as follows: Leaving Gothenburg early in July, 1878, the *Vega* spent some days in the Kara sea, and on August 19th doubled Cape Severo or Tchelyukin, the most northerly point of Asia, and which hitherto had never been rounded by man. Mountains rise south of the cape, and animal and vegetable life abound. The *Vega* coasted over a smooth sea, marked on the charts as dry land, to the mouth of the river Lena, and after a glance at the Siberian islands, where the ice prevented any lengthy exploration, turned southward toward Behring's strait, and was finally forced to settle for the winter, on September 28th, at Kolintchin, a short distance beyond Cook's furthest point, Cape Vankarema. Here the expedition were ice-bound for 264 days; but game—bears, reindeer, foxes and wild fowl—was plentiful, and occupations were many. Human society, too, was not absolutely wanting, as only a mile off was land, the Tschutschi peninsula, where there were villages of some 4,000 Tchik-tchi, pleasant, friendly people. The cold was intense; but the expedition enjoyed excellent health and spirits, and not a single case of scurvy occurred. The shortest day experienced lasted only three hours, when the upper limb of the sun alone was visible. On July 18th the *Vega* started again, passing Cape East two days later, and reached Japan without further accident than slight damage from a gale. Prof. Nordenskjold believes that with a little further experience the voyage will be perfectly safe, and considers that no difficulties await skillful sailors between Japan and the Lena, where, as the Lena taps Central Siberia, there is a large prospective trade.—*London Graphic.*

Gold Discoveries in Amador County.

The recent gold developments in Amador county, California, in the Kerkendall mining district, about four miles from Ione City, deserve more than a passing mention. It appears from the Amador *Times*, of the 8th inst., that about six months ago Mr. Wm. Kerkendall, an old resident of this section of Amador county, made the discovery of what is now known as the Kerkendall mining district, although it is not permanently named as yet, we understand. The lead upon which he made the discovery is now named the Sacramento and Kerkendall ledge. On this new vein 1,500 feet were immediately located, and now owned by the Sacramento Gold and Silver mining company, the principal shareholders being Wm. Kerkendall, of Amador county; H. P. Martin, of Woodland; A. J. Burnett, of Sacramento, and a Mr. Wriston. Considerable prospecting has been done, and assays from the very outcrops have ranged from $7.50 to $25 per ton, and in many instances at various depths assays have shown all the way from $20 up to $357, and in some rare cases much higher. This ledge is 30 feet in width, and is composed of rich sulphurets of a dark color, and is intermixed with fine silver. Claims have already been located on over two miles of this ledge, and fully four miles south just as rich strikes have recently been made. The Kerkendall party are having a smelter, the Robertson process, erected, which will be ready for operation now in a few days, with a capacity of about 12 tons, and a much larger one will be erected soon to keep up with the increasing product of the mine.

A short distance east, and running parallel with the Kerkendall, is the new Peggy Gordon ledge. Several claims have been located on this, and on one a shaft is down 45 feet, with assays proving it to be quite rich.

Immediately west, about 500 feet, and running parallel with the Kerkendall ledge, is the very recent discovered Woodland vein, on which Messrs. H. P. Martin and A. J. Burnett, two energetic gentlemen in mining developments, have located 3,000 feet, and very rich assays have been exhibited.

Still farther west, about 500 feet more, and also running parallel with the Woodland, is the new discovery of the Lone Star lode. This has proven very rich, and was discovered also by Messrs. Martin and Burnett, only a few days since, and these gentlemen with others have located 12,000 feet, and new claims are being taken up daily.

Still west again, and also running parallel with the others, is the newly discovered Savage lode, from which only a few assays have been taken, and this, like the others, seems to contain very rich mineral.

MECHANICAL PROGRESS.

Air Compressor with Water Pistons.

P. Haurez, in the *Revue Universelle des Mines*, speaks of a horizontal double-acting air compressor, with vertical water pistons designed to obviate the one objection commonly appertaining to air compressors of that class—the low speed at which they have to be worked, in consequence, as has generally been supposed, of the large mass of water to be put in motion at each stroke. The real reason, however, for the speed having to be so limited has, in his opinion, been the neglect of certain special conditions necessary to be observed. The water column in the upright chamber at each end of the horizontal cylinder, in order to act to the best advantage as the air compressing piston, ought to retain a level surface, so as to touch the cover throughout its whole extent at the top of its stroke, leaving no clearance space to occasion loss; instead of which, at even a moderate speed of working, the surface ordinarily becomes violently agitated, and the useful effect is poor. Moreover, the inlet and delivery air valves; when sometimes placed within the extent of vertical travel of the water, disturb its steady movement, interrupting what ought to be the uniform sectional area of the column of water.

In the author's air compressor the speed of the vertical water columns is reduced to half that of the working piston, by making the sectional area of each upright water chamber double that of the horizontal cylinder; and the junctions of the cylinder with the chambers are so arranged as to render the enlargement of area gradual, avoiding any sudden change either of area or of direction. The air valves are all placed in the covers on the top of the upright chambers, and are arranged so as to leave the least possible clearance space. Metal mushroom valves being generally found to get out of order soon and leak, flap valves of leather or india-rubber are here employed by preference. The delivery flat valve beats on a horizontal grid in the center of the cover, and each side is an inlet flap heating on a nearly vertical grid; all the valves give large openings for the passage of the air. The water required for keeping the chambers cool is admitted through the inlet air valves.

Several of these air compressore are now in use, with cylinders of 24 inches in diameter and 40-inch stroke. They work with great regularity, and without any shock, at a speed of 30 revolutions per minute, which can be exceeded without inconvenience. This gives a horizontal piston speed of 200 feet per minute, while the surface speed of the water columns in the upright chambers is only half as much, or 100 feet per minute. The results are excellent, owing to the almost entire absence of clearance spaces, and the avoidance of leakage past the piston. The maintenance is merely nominal, and the useful effect, the author considers, must be superior to that realized by other plans, especially after some time of working, when the pistons begin to get worn.

THE "DYNAGRAPH" CAR.—Mr. Dudley's "dynagraph" railroad car has been making experiments of various kinds upon the Boston and Albany railroad. Mr. Dudley has upon this trip devoted himself mainly to testing the comparative economy of power in the use of 42-inch rather than the common 33-inch car wheels, and the condition of the track of the road. The latter proves to be much better than he expected to find it, particularly the section from Worcester to Albany. The ballast is lighter than on some large roads, notably the Pennsylvania, which is usually considered to have the best road bed in the country. In regard to the wheels, the experiments seem to show that on levels the larger ones are 4% or 5% more economical of power, but on grades there is not so much difference. The data for the calculations are drawn graphically on paper by pens, which are ingeniously connected with the draw-bar of the car, or worked by electricity. The draw-bar is connected with a piston which works in a cylinder filled with oil, the pressure is transmitted through a pipe to another cylinder over a table in the car, and a piston is connected with a pen, which marks on a roll of paper the resistance of the train. Other pens indicate the space passed over each second, each 10 seconds and each minute, each revolution of the driving wheels, each mile passed, the alignment of the road, the quantity of water consumed by the engine, the quantity of coal used, the resistance of the wind, etc.

SAW SHARPENING MACHINE.—The *Revue Industrielle* mentions a new machine for sharpening straight and circular saws, constructed by M. Hure. A grinding wheel is mounted on a rocking shaft which can be inclined in any direction, follow all the profiles of the teeth, and even work around hooked teeth, which is something that cannot be done with other machines. This arrangement also permits of the sharpening of saws with different kinds of teeth without changing the "gummer" for another of different thickness. The pulley which drives the grinding wheel or gummer is mounted on the bearings of the rocking shaft so as to avoid all tension of the cord when the wheel is lowered or raised.

The Anucapnic Table-Lamp.

We have been using for the last few evenings a greatly improved and very effective paraffine lamp, provided with the new split-wick anucapnic burner, introduced by Messrs. Rowatt and Sons, of London and Edinburgh. The flame of the new lamp has great body and steadiness, and the combustion is so nearly perfect that no inner chimney is required. The essential feature of the improvement is the exposure of twice the usual surface of the wick to the oil in the reservoir, so that there is always an abundant supply of oil to the flame, and the unnecessary charring of the wick is prevented; the result of this is that the amount of light given off is always uniform, the diminution of the light in this class of lamp usually being due to the accumulation of carbon on the wick interfering with the supply of oil. The mode in which increased suction of oil to the burner is secured is very ingenious; instead of the ordinary single wick the wick-tube is made large enough to receive two side by side. The two wicks placed evenly together, introduced to the lower end of the wick-tube, are caught by the ratchet, and the meshes and threads are so closely pressed into each other that the two wind up and down as accurately and easily as if they were one wick. The parts of the wick below the burner, however, remain separate, and thus there are four surfaces of wick exposed to saturation by the oil instead of only two, as would be the case if only one solid wick were used, and the flow of oil to the flame is thus more continuous and abundant. As proofs of the efficacy of this improvement, a lamp with the reservoir only half or quarter full, or if there be any oil in it at all, will, on being lighted, give as large a flame as if the reservoir were filled up, whereas to get an ordinary lamp to burn at all well the reservoir must be quite filled up before lighting, and also the split-wick will burn the oil out to the last drop without any diminution in the size or quality of the flame. The tops of the two wicks must, of course, be quite level and even with each other, and if one should get higher than the other they can be made level by holding the wick with the finger farthest from the ratchet either up or down as required. The lamp is no more troublesome to attend to than any other paraffine lamp, provided ordinary care be used and cleanliness be strictly observed there will never be cause of complaint, as the light given is considerably greater than that of an ordinary gas burner. The arrangement is altogether worthy of high commendation.—*London Mining Journal.*

Transfer Lathe.

It is frequently necessary in the arts—for instance, in making the copper, iron or steel rolls for calico printing, or the embossing rolls for leather, cloth, sheet zinc, brass or other sheet metals—to transfer any design from small pattern rolls to the large ones upon which the design is to be engraved. To do this work rapidly, cheaply and with accuracy, transfer lathes are used.

The lathe is generally driven by power, but it can be run also by hand by means of a crank or lever. It has a counter-shaft overhead and is reversible. Conical centers are placed on the center shaft to hold the roll on which the transfer is to be made. These centers are movable to suit rolls of different lengths, which are placed on and are taken off by raising one end of the shaft. Attached to the end of this shaft there is an index wheel, which is used to lay out the work accurately, and with the aid of a full set of cut gearing, which is furnished with the lathe, the operator is enabled to move the rest at any given pitch. The steel roll on which the design is engraved is placed in steel journals ground perfectly true and fitted in the head of the rest. It is then brought to bear upon the copper, iron or steel roll which has been placed upon the center shaft, the lathe is put in motion and the design required on the roll is thus transferred from one to the other. The pressure required to make the indentation on the roll is regulated by a weight placed in the hook on the bar attached to the rest. The lathe is furnished with composition boxes, and the small parts, together with the shafts, are made of steel. As the workmanship must be very accurate, all the parts are made to a gauge, so that there may be no lost motion or jar, the slightest defect being sufficient to destroy the impression made while transferring the design from the small steel roll to the roll which is used to do the printing or embossing.

FLUME FOR CORD WOOD.—The manager of the Burlington and Lamoille railroad, in Vermont, has in use an ingenious method of conveying cord wood a distance of two miles and landing it on the cars. He has erected a small flume from a point near the timber leading to the station. A stream of water from a brook is turned into the flume and the wood floats down very rapidly, and at the terminus is shot on to the cars, while the water falling short flows away into the river. Thirty cords of wood are placed on the cars in this manner every day.

AN OCTOPLEX PRINTING TELEGRAPH.—Prof. Klinkerfues, the director of the Gottingen Observatory, has, it is said, taken out a patent for a new invention in telegraphy. The professor has discovered a method by which up to eight different messages may be sent simultaneously by the same wire, an apparatus at the receiving end printing the messages separately and all at the same time.

SCIENTIFIC PROGRESS.

A New People.

The Arctic explorer, Prof. Nordenskjold, found a new race of people in the Arctic regions in latitude 67° 7' north, longitude 137½° west from Greenwich. They are known as the Tschuktschi, and are described as savages because their civilization is not very far advanced. But the Professor is enthusiastic in his testimony to their excellent qualities—social, domestic and national.

They are described as distinctly differing from the Esquimaux tribes; and though it is not yet decided to what race they belong, they are thought to be related to the Kamtchatkadales and Koriaks.

Some very interesting and valuable details have been collected by Nordenskjold and his staff as to their ethnography and history. About 250 years ago they were distinguished and gallant warriors. The discoverers have gathered a valuable assortment of the arms and armor of that period. Many of these implements are preserved among the families, whose habits are no longer aggressive. Very noticeable are their cuirasses, carefully wrought out of mammoth ivory, and fashioned with a remarkable resemblance to the old Roman panoply. Their spears and bows are made of whalebone, wood and ivory, spliced and bound with the sinews of the reindeer, and showing an advanced perception of artistic ornamentation on the part of the makers. One hundred and fifty years ago the famous Russian, Col. Paulovski, commanded an expedition sent against them from Siberian settlements. In his first engagement with them he was badly worsted. He subsequently defeated them, but with heavy loss to his own troops, and has recorded much such a tribute to their valor as Pyrrhus bestowed upon the Italian legions which he overthrew. A mild form of disease is averred by the natives to have been left behind by his soldiery and to be still in existence.

Strangely enough they have no government, no laws, and almost no religion, if any. A Russian starost is their nominal ruler, but has neither authority nor influence. In fact, there seems to be no necessity for the exercise of either the one or the other, for his subjects are evidently an exceptionally excellent and well-disposed people. The foreigners were on terms of intimacy with thousands of them, and never saw or heard of a single case of quarreling among them. Perfect harmony prevailed in the villages and families. Women have great influence, and are treated by the men in all respects as their equals and with much politeness and deference. The language spoken by this tribe is peculiar, and, as far as has been yet determined, shows no affinity to others.

The features are less Mongolian in type than are those of the Esquimaux or the other indigenous tribes of Siberia. The hair is generally, but not invariably, black, and the complexion is decidedly light. Young women are often very fair, handsome, and of perfect symmetry and fine proportions. The men are tall, above the average hight of man's growth, some of them attaining to very little short of the splendid statue of the best specimens of humanity in northern Europe. One woman is mentioned to me as being of gigantic size, so large, in fact, that she might well be shown for money. One of Nordenskjold's attaches has a note—I regret at this moment inaccessible to me—of her hight and bulk, the former being over seven feet. They are omnivorous in their diet.

PRINTING AND LITHOGRAPHIC INKS.—Two kinds of varnish are employed in the manufacture of printing inks: the one obtained by boiling linseed oils, and the other from a mixture of resin and resin oil, the latter being chiefly used for newspapers where rapid drying is of importance. M. Lorilleux allows his linseed oil to rest for two years at a constant temperature. It is then boiled by means of hot air at a distance from the furnaces, so as to remove every risk of fire. A mass of 2,500 kilos is boiled from 25 to 56 hours, and is stirred by a mechanical agitator. The varnish thus obtained is limpid, and flows well. The lamp-black is produced either by means of specially constructed lamps, or by the decomposition of naphthalin oils, which fall by drops into a heated retort. The gaseous products are carried off by tubes, at the end of which they are burnt under sheet-iron bells, while the black is carried off by a current of air into large chambers. It is afterward submitted to calcination.

NEW POCKET LENS.—An English optical instrument maker has just invented a wonderful pocket microscope, upon which scientific writers are conferring much praise. The new lens consists of three lenses, the interior grooves of which are almost transparent; they are lined by transparent cement, which has a refracting index corresponding very nearly with the glass. In this way no light is lost by refraction from the surfaces of the curves. The peculiarities of this remarkable invention are that it focuses three times as far from the object under examination as either the Stanhope or Codrington lens. By this means scientists and others using the microscope can examine opaque objects as well as transparent ones, as the light can be conveniently allowed to fall upon them at any required angle, as the definition is exceedingly sharp.

Theory of the Telephone.

An article lately appeared in *Nature* from Percival Jenns, of British Columbia, which gives the result of some experiments made by that gentleman with the telephone. He says:

Experiments that I have recently made with a Bell telephone, have convinced me that the sounds produced are the result of molecular change in the iron disk, and are the same in kind as those heard in the telephone of Reiss.

My experiments were made with a carbon transmitter and Bell receiver, using a small battery to generate the current. First I removed the bar magnet from the receiver, in accordance with a suggestion made by a writer in *Nature* some months ago. The effect without the magnet was the same as with it. It then occurred to me that the intensity of the sound might be increased by using two disks instead of one. Accordingly I cut two circles out of a piece of sheet iron, leaving a narrow strip of the metal to connect them, of sufficient length to enable the disks to lie on either side of the reel, so as to form, in fact, an armature to the electro-magnet. On experimenting with this my anticipations were fully realized, the sound produced being more than double that from a single disk.

Now, while trying these experiments I held the disks loosely in my hand, without their being in any way fastened to the wood holding the reel, the effect being the same as if firmly secured. In fact, a common dinner knife or a rough piece of iron would emit sound if brought near enough to the core of the electro-magnet.

I have since constructed a very efficient telephone receiver out of a block of wood two inches square and three-quarters of an inch thick. I then drilled a hole sufficiently large to receive the reel, and covered the block with thin sheet iron. It needs no ear-piece, and forms the most effective telephone receiver that I have seen. But, still further to prove that the sounds produced are due to the magnetization of the iron of the disk, and not to mechanical vibrations resulting from the electro-magnet, I made an iron reel, the flanges of which were two inches in diameter. Now, on covering the reel and placing it in circuit, the flanges of the reel gave out sound as clearly as in the Bell telephone. In my judgment this experiment renders it conclusive that the sounds proceed from the magnetization and demagnetization of the iron, and are therefore precisely the same in character as those formed by a Reiss receiver.

CHLORINE, BROMINE AND IODINE.—The three bodies should exist in solution in the state of chlorides, bromides and iodides. If wholly or partly present as chlorates, etc., they must be reduced by treatment with an excess of sulphurous acid. The mixture, acidulated with sulphurous acid, is treated with a slight excess of a mixture of bisulphite of soda and sulphate of copper. The iodide is precipitated immediately and very completely as cuprous iodide, in which state it may be directly determined with much accuracy. The results are liable to be erroneous only in presence of sulpho-cyanides—a circumstance not to be expected in practice. After filtering off the cuprous iodide, the liquid is boiled with an excess of sulphuric acid until all the sulphurous acid of the sulphites has been completely expelled. When this is effected, the liquid is introduced into a flask which communicates, by means of a bent tube, with a Will and Varrentrapp's nitrogen-tube. Into this is introduced a solution of bisulphite, or of sulphurous acid, or bisulphide of carbon, or, if it is preferred, a solution of potassium iodide, and the tube is kept in cold water. To the liquid in the tube is added a small excess of pure chromic acid, and a mixture of sulphuric acid and potassic bichromate, and the liquid is boiled until the bromine is completely expelled. It is then determined, either as bromide of silver, or by a colorimetric process, or indirectly by the volumetric determination of the iodine which it liberates. To determine the chlorine it is merely needful to reduce the excess of chromic acid by means of a sulphite, and to precipitate with silver nitrite.

CARBIDES FROM PETROLEUM.—The light petroleums, if submitted to dissociation by heat, become a source of incomplete carbides of different orders, less rich in carbon than the formenic carbide, but capable, if the action of heat is sufficiently prolonged, of recombining among themselves so as to form more complex compounds. Among the incomplete carbons ethylen, propylen, butylen, and acetylen have been recognized. They are accompanied simultaneously by the ulterior products of their polymerization, or of their reciprocal combination, benzol, ethyl-acetylen, or crotonyl. By a novel application of the general method of solvente the products have been fractionated according to a principle very different from that of a fractionated distillation and crystallization. In this manner each of the industrial products may be resolved into a great number of carbides, among which are anthracen, phenanthren, chrysen, pyren, chrysogen, benzerythren, etc.

A NEW BASE.—A new base has been obtained by C. Bottinger. It is obtained as a product of the reaction of benzol-chloride with aniline. On heating the base with mercuric chloride, or with arsenic acid it is converted into a true coloring matter. In the former case the solution is first clear, and then reddens, the coloring matter being developed with a brisk reaction. The crude dye is a reddish violet.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Oct. 29.		Week Ending Nov. 6.		Week Ending Nov. 13.		Week Ending Nov. 20.	
Alpha	15	13½	14½	14½	14	13	13½	11¾
Alta	5¾	5	6½	5½	5⅝	6	5	4
Andes	1.20	1.05	1.30	1.10	1.15	1.10	1.15	1
Alps	....	....	....	....	....	....	....	....
Argenta	1	90c	1	90c	1	90c	1	90c
Atlantic	....	....	....	....	....	....	....	....
Aurora Tunnel	....	....	....	....	....	....	....	....
Baltimore Con	....	....	....	....	....	....	....	....
Belcher	4.15	3.60	4½	3.70	4	3.85	3.95	3.05
Belmont	1	60c	90c	75c	1.05	75c	1	90c
Best & Belcher	18½	17	21¾	18¾	21¾	19⅝	20	17¾
Bullion	7¾	5⅜	7	6⅜	6⅜	6	6½	5½
Bechtel	1.45	1¼	1.60	1.35	1.95	1¼	1.90	1¾
Belle Isle	4.90	4½	4.85	3.95	6	4.10	4.40	3½
Bodie	14½	13⅜	14	13½	14½	11⅞	13⅛	12½
Benton	3.70	3½	3¾	3.50	3.65	3½	3.60	3
Bulwer	11¾	11½	11⅝	11	11½	11	11	10½
Boyle	....	....	....	....	....	....	....	....
Black Hawk	80c	75c	75c	60c	70c	65c	70c	50c
Belvidere	70c	50c	75c	65c	70c	65c	75c	70c
Booker	90c	70c	95c	70c	1.30	90c	1.05	95c
Caledonia	2.35	2.10	2½	2½	2.30	1.80	1.95	1½
California	5¾	5	5½	5½	5⅝	5½	5½	4½
Challenge	3¾	2	3.20	2¾	2.60	2½	2¾	2½
Chollar	7¾	6½	8½	7½	8⅞	8	7¾	5¾
Confidence	11½	9½	11½	10½	11½	10⅞	11	9⅞
Con Imperial	1.10	1	1.10	1	1.05	90c	90c	75c
Con Virginia	5⅝	5½	5½	5⅜	5⅜	5½	5½	5⅛
Crown Point	4¾	3½	4.15	3.90	3.90	3½	3.90	3
Con Washoe	....	....	....	....	....	....	....	....
Champion	25c	15c	20c	15c	20c	15c	40c	16c
Concordia	....	....	....	....	....	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	35c	70c	1½	75c	1½	1.05	1½	1.10
Eureka Con	29½	24½	27	25½	26½	25½	26	19¾
Exchequer	6	4.45	5½	4.85	4.90	4.60	4.60	4
Endowment	....	....	50c	....	90c	55c	90c	75c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	2½	....	2.55	2	2½	2	2½	2
Gila	20c	5c	35c	30c	50c	35c	40c	30c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	12	11¾	12	....	13	12½	13	12½
Goodshaw	50c	30c	35c	30c	50c	35c	40c	35c
Gould & Curry	11½	9½	11½	10	11½	10½	10½	9½
ale & Norcross	15½	13	18⅜	14⅞	20½	17⅝	18	13⅛
Hillside	1.80	1.65	1.70	1.45	1¾	1½	1¾	1.70
Highbridge	....	....	....	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	15c	....	10c	....	15c	10c	20c	10c
Independence	1.65	1.10	1.35	....	1½	1¼	1.35	90c
Julia	3.65	3.20	3¾	3.30	3½	3.15	3.15	2½
Justice	3.05	2.20	3	2.80	2.95	2.60	2¾	2.40
Jackson	4½	4	4	....	4½	4	4	3½
Joe Scates	....	....	....	....	....	....	....	....
K K Con	....	....	3	....	3½	3	3½	....
Kentuck	4	....	4½	4	4.10	4	3.90	....
Kossuth	15c	....	15c	....	25c	....	20c	....
Keystone	....	....	....	....	....	....	3.65	3.60
Lady Bryan	75c	65c	70c	60c	55c	50c	50c	25c
Lady Wash	1.05	95c	1.15	1.05	1.10	1	1.05	90c
Leopard	50c	....	65c	45c	50c	....	45c	25c
Leviathan	60c	50c	50c	....	60c	50c	50c	40c
Leeds	60c	50c	60c	50c	75c	60c	50c	....
Lee	....	....	....	....	....	....	....	....
May Belle	25c	....	35c	25c	35c	30c	35c	25c
Modoc	35c	10c	....	....	....	....	....	....
Manhattan	2¾	2½	2½	....	2.60	2½	2.60	2½
Martin White	1.80	1¾	1.65	1½	1½	1½	1½	1.20
McClinton	50c	40c	40c	....	70c	40c	75c	60c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	38	33	37¾	33½	34½	30½	33	26
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	....	....
North Con Virginia	....	....	....	....	....	....	....	....
New York	40c	30c	40c	35c	35c	30c	30c	20c
Northern Belle	5⅞	5	5½	5½	6	5½	6½	6
New Coso	....	....	....	....	....	....	....	....
Navajo	50c	45c	60c	50c	75c	65c	60c	45c
Occidental	2.40	2	2.45	2½	2.30	2	2.15	2
Ophir	34½	30	33¾	31¾	32	30½	31½	26½
Oriental	50c	30c	40c	25c	20c	5c	25c	10c
Overman	9½	8½	9½	9	9½	8½	8⅝	8
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	3¾	3½	....	....
Phil Sheridan	50c	35c	50c	35c	35c	30c	35c	30c
Potosi	6	5	6½	6½	5¾	5½	5⅝	4½
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	1½	1.20	1½	1.40	1½	1½	1.40	1.20
Richer	25c	....	....	....	20c	....	....	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	15½	12½	17	14⅞	16⅞	15⅜	15	12⅛
Seg Belcher	20c	....	20	....	....	....	15	13
Sierra Nevada	61½	56	59	50½	57	61⅞	53	44½
Silver Hill	1¾	1.15	1.30	1.20	1½	95c	1.60	65c
Silver King	6⅝	6⅜	7	5⅞	6⅝	6½	6	5½
Silver Prize	....	....	....	....	....	....	....	....
Succor	30c	25c	35c	15c	30c	25c	30c	....
Summit	1.85	1½	1.85	1½	1.65	1½	1.70	1½
Scorpion	5½	4½	5	3.90	4¾	4.40	4½	3.80
Solid Silver	5c	....	50c	5c	30c	25c	30c	....
South Bodie	25c	15c	15c	....	20c	....	25c	20c
South Standard	....	....	....	....	....	....	....	....
Star	55c	50c	40c	....	40c	....	35c	30c
St. Louis	....	....	....	....	....	....	....	....
Syndicate	6⅝	6	6½	6	6	5	5¾	3.90
Tioga Con	3¾	3.40	3½	3½	3.40	2.70	3	2¾
Tiptop	1.40	1.30	1.40	1.30	1.65	1.35	1.95	1½
Trojan	15c	10c	15c	....	15c	10c	10c	....
Union Con	90½	73	91½	81½	83	62½	66½	62½
Utah	22½	20	22	20	20¾	18½	18½	16
Vermont Con	....	....	....	....	....	....	....	....
Ward	2½	2.15	2½	2⅜	2.40	2.10	2.10	1⅞
Wells-Fargo	15c	10c	10c	....	10c	5c	10c	5c
Woodville	35c	25c	35c	....	25c	....	30c	25c
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	17½	14	17	15⅝	16½	15	16½	14⅞

Sales at S. F. Stock Exchange.

Friday A. M., Nov. 14.
10 Alpha.....13
90 Alta.....5
90 Andes.....1.10@1.15
130 Best & Belcher..19¾@19⅝
170 Belcher.....3.90@3.95
105 Bullion.....5⅞@5¾
60 Benton.....3.60@3½
445 California.....5½
550 Chollar.....7½@7¾
600 Con Virginia.....5⅛
205 Crown Point...3.90@3.80
60 Confidence.....10¾
610 Con Imperial.....85c
150 Caledonia.....1.90@1.95
130 Challenge.....2.60
600 C Dorado.....2.10@2.15
70 Exchequer.....4.60@4.55
700 Flowery.....50c
190 Gould & Curry...10¾@10½
560 Golden Gate.....2½@2.45
265 Hale & Nor.....17⅞@18
220 Justica.....2¾
60 Julia.....3.16
100 Keystone.....3.65
240 Lady Bryan.....50c
10 Lady Wash.....1.05
60 Leviathan.....50c
340 Mexican.....31@31½
2150 Mackey.....15c
550 Mt View.....3.90@4.10
695 N Bonanza.....1¼@1.15
30 North Carson.....15c
500 New York.....30c
50 Occidental.....2.15
330 Ophir.....30@30½
10 Overman.....8½
130 Potosi.....5⅝
80 Savage.....14⅞@15
420 Sierra Nevada....53@52½
100 Solid Silver.....30c
600 Succor.....30c
765 Silver Hill.....1.05@1
180 Scorpion.....4½
160 Trojan.....10c
20 Utah.....18½
370 Union Con.....64½@65⅛
300 Ward.....2.10@2
810 Wells Fargo.....5c
140 Yellow Jacket.....16½

AFTERNOON SESSION.
200 Albion.....10c
1120 Adenda.....65c
600 Argenta.....1
220 Belmont.....95c
350 Black Hawk.....70@60c
660 Booker.....1@1.05
50 Belvidere.....70c
800 Bechtel.....1.80@1.90
50 Bulwer.....10¾@10⅝
600 Belle Isle.....4.40@4.35
400 Boston.....1.65@1.90
550 Chammon.....15c
145 C Pacific.....7
810 Day.....1¼
120 Eureka Con.....26
400 Endowment.....80@85c
500 Goodshaw.....40c
150 Grand Prize.....2½
100 Gila.....40c
190 Independence....1¼@1.30
250 Jackson.....4
645 Jupiter.....1.80@1½
130 Leopard.....45@40c
350 Metallic.....85@80c
530 McClinton.....75@70c
130 May Belle.....25c
140 Mono.....5⅞
100 Mt Diablo.....12½@12¾
640 Martin White.....1¼
1350 N Belle Is.....45c
120 Navajo.....60c
250 Noonday.....4.90@5
190 N Noonday.....3.60
200 Oro.....15c
200 Orient.....25c
1100 Paradise.....1
1420 Queen Bee.....45c
100 Real del Monte.....5½
50 Ray'd & Ely.....1.40
315 Syndicate.....5½@5
500 Summit.....1.70
1890 S Bulwer.....40@50c
50 Silver King.....6
180 Tiptop.....1.95
100 Tioga Con.....3
500 University.....15c
600 Wales.....5@5¼
100 W Pacific.....25c

Saturday A. M., Nov. 15.
35 Alpha.....13½
445 Alta.....5
290 Andes.....1.05
1330 Addenda.....70@60c
750 Altas.....25c
40 Argenta.....1
165 Best & Belcher...19@19½
390 Belcher.....3.60@3½
420 Bullion.....5⅜
305 Benton.....3½
200 Belmont.....90c
310 Belle Isle.....4.35@4.40
5 Bodie.....12¾
725 Bechtel.....1.90@1.85
110 Belvidere.....75@70c
315 Bulwer.....11@10½
450 Black Hawk.....55@70c
676 Booker.....1
345 Boston.....1.70
140 California.....5@5½
125 Chollar.....7½@7¾
760 Con Virginia.....5½
330 Con Imperial.....85@90c
370 Crown Point...3.60@3.40
110 Confidence.....10½
160 Caledonia.....1.83
40 Challenge.....2.60
500 Con Dorado.....2.15@2½
120 Caledonia (B H).3¼@3.40
25 C Pacific.....6¾
200 Dudley.....95c@1
250 Day.....1.10@1.20
100 Exchequer.....4½@4.40
165 Eureka Con.....23¾
1250 Endowment.....90@75c
900 Flowery.....25@35c
490 Gould & Curry....10½@10
325 Golden Gate.....2.45
700 Gila.....40c
50 Grand Prize.....2.10
416 H & Norcross....17½@17⅞
200 Hillside.....1½
190 Independence.....1.35
1230 Julia.....3@2.90
140 Justice.....2¾@2.70
200 Jupiter.....1.90
200 Keystone.....3.60@3.55
250 Lady Wash.....1.05
100 Leopard.....30c
220 Mexican.....33@30½
300 Mackey.....15c
250 Mount View...4.40@4.60
100 Metallic.....75c
100 Mt Diablo.....12¾
750 May Belle.....30c
45 Mono.....6
710 M White.....1½
200 Mammoth.....6¼@6⅜
50 New York.....30c
170 N Bonanza.....1.10
310 Northern Belle.....6
100 Navajo.....60c
2450 N Belle Is.....45@40c
340 Noonday.....5@4.95
300 N Noonday.....3.90@4
340 Ophir.....29½@29¾
50 Overman.....8⅜
100 Occidental.....2
850 Oriental.....10c
200 Orient.....25c
150 Potosi.....5¾
100 Phil Sheridan.....35c
250 Paradise.....1
350 Queen Bee.....40c
100 Raymoud & Ely.....1.35
100 Real Del Monte.....5¼
230 Savage.....13@14¼
460 Sierra Nevada....51½@50½
85 Silver Hill.....85@65c
1000 Senator.....15c
276 Scorpion.....4½@4.05
100 Solid Silver.....30c
250 Summit.....1½
20 Syndicate.....5
1200 S Bulwer.....50c
200 S Bodie.....25c
20 Tioga.....3
520 Tiptop.....1.90
115 Utah.....18@17
245 Union Con.....65½@62
1500 University.....15c
105 Wales.....4½
2100 Wells-Fargo.....5@10c
320 Yellow Jacket...15½@16⅛

Monday A. M., Nov. 17.
125 Alpha.....13½@13
320 Andes.....1.05@1
190 Alta.....4.80@4¾
740 Belcher.....3.40@3½
535 Bullion.....6@6½
350 Best & Belcher...18¾@17¾
240 Benton.....3.10@3½
570 C Dorado.....2.05@2
200 California.....4.85@4¾
400 Con Imperial.....85@80c
430 Crown Point.....3@3½
970 Con Virginia.....5½@5¼
435 Chollar.....7@7½
70 Caledonia.....1.70
135 Challenge.....2½@2¼
210 Exchequer.....4.30@4.40
600 Flowery.....35c
775 Gould & Curry.....9½@9½
240 Golden Gate...2.40@2.45
660 Hale & Nor.....16@16¾
70 Justice.....2.60
330 Julia.....2¾@2.70
150 Keystone.....3.65@3.60
200 Lady Bryan.....25c
250 Lady Wash.....1
1065 Mexican.....27½@26
2100 Mackey.....15c
100 Mt View.....2½
1340 N Bonanza....1.20@1.30
285 New York.....30c
250 North Carson.....10c
660 Ophir.....27@26½
120 Overman.....6⅞
300 Potosi.....4.60@4½
70 Phil Sheridan.....30c
645 Sierra Nevada...44½@45½
555 Savage.....13@12½
600 Silver Hill.....1½@1.60
790 Scorpion.....4@3.90
300 Trojan.....10c
100 Utah.....16½@16
1495 Union Con.....55@52½
200 Wells-Fargo.....5c
1190 Ward.....1.90@2
680 Yellow Jacket....14⅞@15½

AFTERNOON SESSION.
440 Argenta.....95c@1
500 Atlas.....25c
950 Adenda.....50@60c
490 Bodie.....12½@12⅝
1200 Bechtel.....1.85
110 Bulwer.....11
1190 Belle Isle.....4.20@4.15
300 Booker.....95c@1
750 Black Hawk.....50c
555 Belmont.....95@90c
110 Belvidere.....70@75c
440 Boston.....1.65@1½
100 Champion.....25c
550 Caledonia (B H)....3½@3
2325 Day.....1.20@1¼
50 Eureka Con.....22¾
850 Endowment.....80@75c
200 Grand Prize.....2@2.10
2125 Gila.....30@35c
100 Hussey.....20c
150 Hillside.....1.70
240 Jupiter.....2
200 Jackson.....3½
25 K K Con.....3¾
250 Mt Diablo.....12½@12⅜
300 McClinton.....70c
140 Mono.....6
1100 May Belle.....35@30c
300 Metallic.....90c
465 M White.....1¼@1.20
250 Mammoth.....6½
180 Northern Belle.....6@6½
420 Navajo.....60@50c
950 N Belle Is.....40@50c
460 Noonday.....4½@4¼
270 N Noonday.....3⅜
200 Oriental.....10c
100 Orient.....20c
50 Paradise.....1
550 Queen Bee.....40c
50 Real del Monte.....5½
180 Raymond & E....1.30@1½
100 S Bodie.....25c
200 Star.....35c
790 S Bulwer.....60@50c
160 Syndicate.....4¾@4.90
50 Summit.....1.55
200 Tiptop.....1¾
90 Tioga Con.....2.90
400 University.....15c
725 Wales.....4½@4½

Tuesday A. M., Nov. 18.
260 Alta.....4½@4
160 Alpha.....12@11¾
745 Andes.....1.05@1
945 Belcher.....3.05@3½
290 Best & Belcher....18@17¾
720 Bullion.....5½@5½
1215 Beutou.....3.05@3
195 Crown Point.....3@3½
2400 Con Imperial.....80@90c
140 Confidence.....10@9¾
260 Challenge.....2½@2.40
350 Con Dorado.....2
760 Con Virginia.....5½@5⅜
360 Chollar.....6¾@7
340 California.....4.90@5
435 Caledonia.....1.70@1.60
230 Exchequer.....4
925 Flowery.....35@45c
295 Gould & Curry.....9½@9¾
240 Golden Gate.....2.40
720 H & Norcross.....15@14½
680 Julia.....2¾@2½
260 Justice.....2.60@2.55
100 Keystone.....3.60
10 Kentuck.....3.90
550 Leviathan.....45c
385 Lady Wash.....90c
295 L Bryan.....50@40c
805 Mexican.....28½@27½
240 Mt View.....4.40@4½
1600 Mackey.....15c
1345 N Bonanza.....1.10@1
1070 New York.....30@20c
250 North Carson.....10c
555 Ophir.....27¾@27½
140 Overman.....8½
435 Potosi.....4¾@4¾
200 Plutus.....2.15
100 Phil Sheridan.....30c
960 Sierra Nevada....44½@45
520 Savage.....12⅝@12⅛
410 Scorpion.....3.95@3.80
565 Silver Hill.....1⅜@1.40
100 Trojan.....10c
190 Utah.....16½@17
935 Union Con.....59@60
400 Wells-Fargo.....5@10c
530 Ward.....1.90@1½
530 Yellow Jacket...14½@15⅛

AFTERNOON SESSION.
150 Argenta.....95c
40 Albion.....20c
600 Addenda.....60@55c
200 Belmont.....90c
420 Belle Isle.....4.05@4.10
180 Bulwer.....11
150 Booker.....1
50 Black Hawk.....50c
170 Bodie.....13@13⅛
480 Bechtel.....1.80@1.85
330 Boston.....1.60@1.65
1100 Champion.....25@40c
100 C Pacific.....6½@6
110 Caledonia (BH).....3¾@3
250 Day.....1½@1.15
610 Dudley.....60c@1
420 Eureka Con.....20½@21
1010 Endowment.....75@80c
500 Gila.....40@35c
200 Grand Prize.....2
160 Golden Terra.....13
200 Hussey.....10c
25 Hillside.....1¾
350 Independence.....1.30
450 Jupiter.....1¾@1.80
100 Leopard.....30c
30 Manhattan.....2½
300 Metallic.....1
225 Mt Diablo.....12½
40 Mono.....6
265 McClinton.....70@60c
305 Martin White.....1½
200 Navajo.....45c
95 Northern Belle....6½@6⅜
100 N Belle Is.....40c
200 Noonday.....4½@4.60
3850 Oriental.....10@25c
400 Paradise.....90c
100 Queen Bee.....35c
575 Raymond & Ely..1.30@1½
100 Star.....35c
255 Syndicate.....4½@3.90
265 Summit.....1½@1.65
25 Silver King.....5½
1300 S Bulwer.....60@55c
350 Tioga.....2¾@2.90
600 Tiptop.....1.65@1½
230 University.....15c
125 Wales.....3¾@3½

Wed'sday A.M., Nov. 19.
220 Alta.....4.60
295 Andes.....1.05
50 Alpha.....12½@12⅛
465 Belcher.....3.15@3½
125 Best & Belcher.....18
175 Bullion.....5⅝
250 Benton.....3.20@3¼
515 California.....5
210 Caledonia.....1.55
130 Con Dorado.....2½
785 Crown Point.....3@3.05
1300 Con Imperial.....80@75c
645 Con Virginia.....5½@5⅝
85 Confidence.....9¾
150 Chollar.....6¾@6¾
545 Exchequer.....4.15@4.10
550 Flowery.....40@50c
35 Gould & Curry.....9¾
385 Golden Gate.....2.40@2⅜
1065 Hale & Nor.....13½@13⅝
290 Julia.....2.70
250 Justice.....2.70@2¾
100 Kossuth.....20c
1200 Lady Wash.....90@95c
50 Lady Bryan.....45c
450 Mexican.....28½@28
4550 Mackey.....15c
200 Mt View.....4¾@5
50 N Bonanza.....1.10
540 New York.....25@20c
250 North Carson.....15c
20 Occidental.....1.90
120 Ophir.....28@28½
35 Overman.....8@8½
235 Potosi.....4⅜@4.35
100 Phil Sheridan.....30c
200 Plutus.....2.10
235 Silver Hill.....1.40
450 Scorpion.....3.95@3.85
525 Savage.....12½@12⅛
10 Seg Belcher.....13
50 Succor.....20c
1745 Sierra Nevada....46@47¾
200 Trojan.....10c
60 Utah.....17
1855 Union Con.....60@61½
115 Ward.....2
40 Woodville.....25c
350 Wells-Fargo.....5c
105 Yellow Jacket....15@15⅛

AFTERNOON SESSION.
1905 Addenda.....60@80c
585 Argenta.....95@90c
250 Boston.....1.60
20 Black Hawk.....50c
575 Booker.....1
130 Bulwer.....11
2230 Belle Isle.....3½@3.90
410 Bodie.....12¾@12⅝
305 Bechtel.....1¾
120 Belmont.....1
450 Champion.....35@30c
1360 Caledonia (B H).....3½
25 C Pacific.....6⅜
300 Dudley.....50c
520 Day.....1¼@1.20
335 Eureka Con.....20½@19⅞
750 Endowment.....80@75c
16 Grand Prize.....2
50 Golden Terra.....12½
50 Goodshaw.....6
925 Gila.....35@40c
600 Hussey.....15c
280 Hillside.....1.70
375 Independence.....90c@1
310 Jupiter.....1⅞@1½
600 Leeds.....50c
700 Leopard.....25c
865 Martin White....1½@1.20
65 Manhattan.....2½@2.60
1250 Metallic.....95c@1
305 Mono.....5⅜@5½
285 Mt Diablo.....12½@12
250 N Belle Is.....40@35c
65 Northern Belle.....6
310 Noonday.....4⅞
185 N Noonday.....3⅞@3.60
800 Oriental.....15@20c
200 Paradise.....90c
400 Queeu Bee.....35c
50 Raymond & E.....1.20
100 Real del Monte.....5@5½
1510 S Bulwer.....65@60c
110 South Bodie.....20c
1460 Syndicate.....5
215 Summit.....1½@1.35
50 Star.....30c
2600 Tuscarora.....10c
115 Tioga Con.....2¾
1045 Tiptop.....1½
915 Wales.....3¾

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Aurora Tunnel & M Co	California	4	10	Nov 13	Dec 15	Jan 3	C V Hubbard	203 Bush s
Argonaut M & M Co	California	2	10	Oct 7	Nov 15	Dec 8	J L Fields	240 Montgomery st
Bechtel Con M Co	California	3	15	Oct 1	Nov 5	Nov 25	W H Lent	309 Montgomery st
Caledonia S M Co	Nevada	29	50	Nov 10	Dec 16	Jan 6	R Wegener	414 California st
Champion M Co	California	4	20	Oct 15	Nov 20	Dec 9	Jno Crockett	203 Bush st
Defiance G M Co	California	4	30	Nov 12	Dec 17	Jan 6	W H Lent	309 Montgomery st
Flowery M Co	Nevada	3	25	Nov 14	Dec 19	Jan 7	W W Stetson	309 Montgomery st
Gen'l Thomas M & M Co	Nevada	5	25	Nov 3	Dec 8	Dec 29	Wm Willis	309 Montgomery st
Independence M Co	Nevada	4	25	Nov 15	Dec 18	Jan 8	E M Hall	327 Pine st
Indian Queen M & M Co	Nevada	2	10	Nov 6	Dec 20	Jan 10	A K Durbrow	309 Montgomery st
Julia Con M Co	Nevada	10	1 00	Nov 19	Dec 24	Jan 15	H A Charles	419 California st
Jupiter M Co	California	6	35	Nov 12	Dec 15	Jan 8	E C Masten	309 Montgomery st
K K Con M Co	Nevada	9	2 00	Oct 3	Nov 5	Dec 3	B B Minor	309 Montgomery st
McCrackin Con M Co	Arizona	4	25	Nov 17	Dec 24	Jan 20	A Wenzelburger	216 Sansome st
Mexican G & S M Co	Nevada	9	2 00	Nov 7	Dec 11	Dec 31	C L McCoy	203 Bush st
Murchie G & S M Co	California	2	25	Oct 9	Nov 8	Dec 8	S D Rogers	328 Montgomery st
New York M Co	Nevada	20	30	Oct 22	Nov 24	Dec 16	D L Thomas	203 Bush st
Northern Belle Isle M Co	Nevada	1	10	Nov 8	Dec 11	Dec 31	E M Hall	327 Pine st
Occidental Con G M Co	California	3	10	Nov 10	Dec 20	Jan 10	W T Smith	402 Montgomery st
Oriental Con G & S M Co	California	5	25	Nov 8	Dec 10	Dec 27	H C Hinman	411 California st
Potosi M Co	Nevada	2	50	Nov 4	Dec 9	Dec 30	W E Dean	203 Bush st
Rough & Ready Con G M Co	California	1	05	Oct 15	Nov 19	Dec 9	W H Lent	309 Montgomery st
Seg Belcher M Co	Nevada	16	3 00	Oct 31	Dec 5	Dec 26	Geo D Edwards	414 California st
Sierra Nevada S M Co	Nevada	60	2 00	Oct 31	Dec 4	Dec 24	W W Stetson	309 Montgomery st
Silver Hill M Co	Nevada	8	50	Oct 16	Nov 19	Dec 11	W E Dean	203 Bush st
Solid Silver G & S M Co	Nevada	2	25	Oct 6	Nov 10	Dec 8	J J Applegate	320 Sansome st
Utah S M Co	Nevada	27	2 00	Oct 22	Nov 25	Dec 13	G C Pratt	309 Montgomery st
Wells Fargo M Co	Nevada	13	10	Nov 17	Dec 22	Jan 9	D L Thomas	203 Bush st
Yellow Jacket S M Co	Nevada	24	1 00	Oct 13	Nov 18	Dec 18	Mercer Otey	Gold Hill, Nevada

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Hydraulic Grav M Co	California	1	20	Oct 2	Nov 10	Dec 13	James Ireland	216 Sansome st
Butte Hydraulic M Co	California	—	10 00	Oct 31	Dec 2	Dec 22	L L Dennery	220 Sansome st
Cataract & Wide West H M Co	Cal	—	25	Nov 15	Dec 22	Jan 12	Wm B Lake	26¼ Kearny st
Chollar M Co	Nevada	—	50	Nov 4	Dec 9	Dec 29	W E Dean	203 Bush st
Diana G & S M Co	Nevada	4	10	Sept 24	Nov 17	Dec 15	J T McGeoghan	318 Pine st
Florida Hill M Co	Idaho	1	10	Oct 31	Dec 5	Dec 30	R Wegener	414 California st
Mayflower G M Co	California	6	10	Oct 9	Nov 12	Dec 9	J Morizio	328 Montgomery st
McClinton M Co	California	4	25	Oct 10	Nov 14	Dec 4	W H Lent	309 Montgomery st
Meadow Valley M Co	Nevada	15	25	Sept 12	Nov 12	Dec 8	T W Colburn	414 California st
Monte Cristo Con M Co	California	1	10	Oct 3	Nov 17	Dec 15	Butler Burris	309 Montgomery st
Morgan M Co	California	5	30	Nov 13	Dec 23	Jan 15	J J Raphael	533 Kearny st
Noh Hill G & S M Co	California	1	15	Oct 6	Nov 10	Nov 28	J H Sayre	330 Pine st
Northern Light G & S M Co	Cal	5	10	Nov 5	Dec 8	Dec 26	F S Monroe	310 Pine st
Numa M Co	Nevada	2	02	Oct 23	Dec 22	Jan 12	D Wilder	328 Montgomery st
Orion M Co	California	5	30	Oct 9	Nov 10	Nov 25	P Conklin	28 Sansome st
Quartz Mountain G M Co	California	7	50	Sept 20	Oct 27	Nov 17	E Hestres	729 Montgomery st
Quinn M Co	California	—	25	Nov 15	Dec 19	Jan 7	T J Blakeney	Palace Hotel
Rustler G M Co	California	2	10	Oct 21	Nov 24	Dec 12	A F Main	309 California st
San Xavier M & S Co	Arizona	1	25	Oct 14	Dec 1	Dec 22	F A McGee	32 Merchants' Ex
South Bulwer G M Co	California	5	25	Oct 27	Nov 29	Dec 20	W Stuart	320 Sansome st
Summit G M Co	California	4	30	Nov 17	Dec 22	Jan 12	W H Lent	309 Montgomery st
Telfair M Co	Arizona	1	02	Nov 12	Dec 20	Jan 15	J Pentecost	702 Market st
Wide Awake P & M Co	Arizona	8	03	Oct 11	Nov 11	Dec 11	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Andes S M Co	Nevada	M Lauders	309 Montgomery st	Annual	Dec 18
Amazon Con M Co	Nevada	John Crockett	203 Bush st	Annual	Nov 25
Butte Creek Hydraulic M Co	California	R L Taylor	310 Pine st	Stockholders	Dec 1
God rey Grav M Co	California	J M Buffington	309 California st	Annual	Dec 1
Mexican G & S M Co	California	C L McCoy	203 Bush st	Annual	Dec 2
Mexican M & R E Co	——	C A Morse	217 Sansome st	Annual	Dec 1
Napa Con Q M Co	California	W W Parrish	328 Montgomery st	Annual	Nov 26
Potter M Co	——	C W Crane	10 Leidesdorff st	Annual	Dec 1
Swamp Angel G M Co	California	C W Badger	315 California st	Annual	Dec 4

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Belle Isle M Co	Nevada	R H Brown	S F Stock Ex	75	Nov 5
Bodie Con M Co	California	W H Lent	Nevada Block	50	Nov 1
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	2 00	Oct 20
Pioneer M Co	California	J W Pew	310 Pine st	08	October 6
Standard Con M Co	California	Wm Willis	309 Montgomery st	50	Oct 13

SALES OF LAST WEEK AND THIS COMPARED

Thursday A.M., Nov. 13.
80 Alpha.....13½
230 Alta.....5½@5
220 Andes.....1.10@1.15
35 Best & Belcher.....19⅞
220 Bullion.....6½@6
150 Belcher.....3.85
100 Benton.....3.60
120 California.....5½
20 Challenge.....2.60
200 Chollar.....8½
400 Con Virginia.....5⅝@5½
125 Crown Point.....3.80
250 Con Imperial.....95@90c
90 Caledonia.....1.90
935 C Dorado.....2@2.10
195 Exchequer.....4.60
170 Flowery.....60@55c
75 Gould & Curry.....10½
700 Golden Gate.....2.45@2½
310 Hale & Nor.....18½@18⅜
430 Julia.....3½@3.15
500 Kossuth.....25c
675 L Bryan.....50c
620 Lady Wash.....1.10
500 Leviathan.....50c
135 Mexican.....32
300 Mountain View...3.85@4
3050 Mackey.....15@20c
250 New York.....30@35c
450 N Bonanza.....1.30@1½
320 Occidental.....2.20
205 Ophir.....31@30¾
150 Overman.....8¾@9
350 Original Keystone.....3½
100 Phil Sheridan.....30c
45 Potosi.....5½@5½
300 Plutus.....2.30
550 Succor.....30c
80 Savage.....15½@15⅞
225 Sierra Nevada.....53@54½
135 Silver Hill.....1.10@1
190 Scorpion.....4.60@4½
85 Utah.....19
300 Union Con.....65½@66½
220 Ward.....2¼@2.10
4300 Wells Fargo.....5c
400 Yellow Jacket...16½@16½

AFTERNOON SESSION.
1300 Argenta.....95c@1
1050 Adenda.....70@65c
550 Atlas.....30c
875 Belmont.....95c@1
375 Belle Isle.....4.15@4½
1100 Boston.....1.60@1.65
50 Black Hawk.....70c
1100 Booker.....1
300 Belvidere.....75@70c
605 Bodie.....12⅝@12⅝
495 Bechtel.....1.90@2
260 Bulwer.....11
350 Champion.....15@20c
150 Caledonia (B H).....3.40
100 Con Pacific.....7
350 Dudley.....1
000 Day.....1.40@1.35
50 D Standard.....30c
135 Eureka Con...25½@25¾
1250 Endowment.....90c
40 Golden Terra.....12½
200 Gila.....35c
820 Goodshaw.....40c
110 Grand Prize.....2.15@2½
220 Hillside.....1¾@1.70
150 Hussey.....15c
1155 Independence.....1½
295 Jupiter.....1 90@2
175 K K Con.....3½
125 Leeds.....60c
300 M White.....1½
95 Mono.....6
200 May Belle.....30@35c
100 Metallic.....95c
200 Mt Diablo.....12½
250 McClinton.....65@70c
40 Noonday.....4.60
2225 N Belle Is.....55@50c
150 N Noonday.....3½
130 Northern Belle.....6
180 Navajo.....50@60c
250 Orient.....30c
1080 Oriental.....10c
250 Paradise.....1
235 Queen Beo.....50c
235 Real del Monte.....6
120 Raymond & E.....1.40
1000 S Bulwer.....40c
220 Summit.....1½@1.60
200 Syndicate.....5½@5½
1400 Tiptop.....1¾@2
120 Tioga Con.....3@2.90
40 Wales.....6
100 W Pacific.....50c

Thursd'y A.M., Nov. 20.
240 Alpha.....12½@12⅛
125 Alta.....4.70@4.65
420 Andes.....1.15@1.10
120 B & Belcher.....19⅞@20
615 Belcher.....3.15@3.20
190 Bullion.....6½@6
190 Benton.....3.40
120 California.....5½
35 Con Virginia.....5¼@5⅝
240 Chollar.....7½@7¾
350 Con Imperial.....80@85c
175 Confidence.....11@10⅞
710 Caledonia.....1.70@1½
280 Challenge.....2.60@2¾
625 C Dorado.....2@2.15
355 Exchequer.....4½@4½
615 Flowery.....40@45c
285 Gould & Curry...10½@10¾
280 Golden Gate.....2.40
440 Hale & Nor.....15⅞@15⅝
110 Justica.....2.40@2½
350 Julia.....2.60@2.65
150 Keystone.....3.60
50 Leviathan.....40c
500 Lady Bryan.....35c
1450 Lady Wash.....95@90c
565 Mexican.....31@31½
1500 Mackey.....15c
200 Mt View.....5@5⅜
1100 New York.....20@25c
420 N Bonanza....1.15@1.10
375 Ophir.....30½@31½
45 Overmau.....8½@6¾
100 Phil Sheridan.....30c
515 Savage.....13½@13¼
550 Sierra Nevada....50@48½
100 Silver Hill.....1½@1.40
10 Seg Belcher.....15
900 Scorpion.....4@3.90
250 Trojan.....10c
190 Utah.....17¼@17½
645 Union.....65@66½
800 Wells-Fargo.....5c
360 Ward.....2
50 Woodville.....30c
260 Yellow Jacket....15½@16

AFTERNOON SESSION.
210 Argenta.....95@90c
615 Addenda.....75@80c
1200 Atlas.....30c
200 Boston.....1.70@1.65
100 Black Hawk.....50c
200 Booker.....90@80c
175 Belvidere.....60c
425 Bodie.....12@12½
395 Bechtel.....1¾@1.80
700 Belmont.....1@1.05
210 Belle Isle.....3.60@3¾
200 Champion.....30c
25 C Pacific.....6¾
100 Defiance.....40c
200 D Standard.....30c
300 Dudley.....75c
730 Day.....1.20
600 Endowment.....75c
20 Eureka Con.....18
50 Goodshaw.....35c
300 Grand Prize.....2@1.90
1950 Hillside.....1.60@1½
350 Indopendenca.....80c
160 Jupiter.....1½
340 Mammoth.....6½
170 Mt Diablo.....12
330 Mono.....6¾@5⅝
200 Martin White...1½@1.20
600 McClinton.....70@65c
1170 Metallic.....1@85c
175 Northern Belle....6⅜@6⅞
800 N Belle Is.....35@40c
330 Noonday.....4¾@4½
100 N Noonday.....3¾
50 Navajo.....50c
100 Orient.....20c
1000 Oriental.....15@20c
100 Paradise.....95c
100 Queen Bee.....40c
300 Real del Monte.....5
500 Richer.....20c
80 Raymond & Ely.....1
400 Rustler.....10c
1570 S Bulwer.....65@60c
150 Star.....35c
800 Sta Mina.....85c
50 Silver King.....5½
195 Summit.....1½
220 Syndicate.....3½
125 Tioga Con.....2¾
830 Tiptop.....1½
400 University.....10c
820 Wales.....3¾

Pacific Board—Latest Sales.

Wed'sday A.M., Nov. 19.
50 Alpha.....12¾@12
50 Argenta.....90c
50 Belcher.....3.10
110 Benton.....3.05
130 Bullion.....5¾@5.70
60 Best & Belcher.....18
115 California.....5½@5½
30 Con Virginia.....5½@5.30
135 Crown Point.....3.20@3
570 Colorado.....3½@4
100 Con Imperial.....80c
100 Endowment.....75c
60 Gould & Curry.....9¾@9½
135 Hale & Nor.....14@13¾
180 Justice.....2.55@2.60
130 Mexican.....28½
100 N Bonauza.....1
160 Ophir.....28½@28½
310 Savage.....12@12½
200 S Nevada.....46@47½
75 Silver Hill.....1.40@1.35
1555 Tuscarora.....30@35c
90 Union.....59@61¾
20 Yellow Jacket.....15

AFTERNOON SESSION.
50 Andes.....1.10
65 Alpha.....12¾@13
50 Best & Belcher.....18⅞
50 Benton.....3.30
50 Con Virginia.....5½
20 Caledonia.....1.60
90 California.....5½
20 Chollar.....7⅝
100 Crown Point.....3
100 Endowment.....75c
75 Exchequer.....4.05@4.30
50 Gould & Curry...10½@10⅝
50 Hale & Nor.....14½
40 Julia.....2.55
50 Manhattan.....2⅞
500 Mackey.....15c
200 Mono.....6
200 Oro.....1⅜
50 Ophir.....29@28⅞
200 Savage.....12⅝@12⅞
110 Silver Hill.....1.45
100 Scorpion.....4
20 Sierra Nevada.....46½@46
500 Trojan.....12c
100 Ward.....1.95
10 Yellow Jacket.....15½

California Board—Latest Sales.

Wed'sday A.M., Nov. 19.
35 Alta.....4.70
1000 Atlas.....35@40c
1500 Ætna.....3c
75 Belcher.....3.10
20 Best & Belcher.....18
90 Bullion.....5⅝@5¾
175 Benton.....3.10
90 California.....5½@5½
50 Con Virginia.....5⅜@5½
50 Con Imperial.....80c
40 Crown Point...3.10@3.05
30 Chollar.....7
120 Challenge.....2½
150 Caledonia.....1.60@1⅝
45 Exchequer.....4.05@4
50 Gould & Curry.....9¾@9⅝
60 Hale & Nor.....13½@14⅜
20 Julia.....2.15
45 Justice.....2.55
100 Leviathan.....60c
30 Mexican.....28½@28⅜
100 M White.....1½
100 Mint.....12½c
1000 N Carson.....1c
200 New York.....25c
20 Ophir.....28½@28
50 Potosi.....4.60@4.65
40 Savage.....12½@12
20 Sierra Nevada....47½@47
250 Silver Hill.....1.40
100 S Utah.....7c
150 S Bodie.....22c
100 Trojan.....9c
20 Union.....59@59½
100 Wells-Fargo.....5c
30 Yellow Jacket...15@15⅛

AFTERNOON SESSION.
20 Alta.....4.70

300 Atlas	35@37½c	300 Enterprise	1½
220 Andes	1.05	35 Gould & Curry	10
220 Argenta	1	80 Hale & Nor	13½@13
700 Ætna	3c	20 Julia	2
75 Belcher	3.10	40 Mexican	29
20 Best & Belcher	81	40 Ophir	29@28½
40 Bullion	5½	300 Orient	20@22½c
280 Big Prize	25c	25 Potosi	4½
400 Black Hiller	30c	40 Savage	12
120 California	5½	20 Sierra Nevada	47½
70 Con Virginia	1½	120 Silver Hill	1.40
300 Con Imperial	80@65c	200 Trojan	10c
20 Chollar	6½	40 Union Con	63½@63
140 Caledonia	1.55	300 Wells-Fargo	5c
80 Confidence	97	140 Woodville	25c
140 Exchequer	4.05	20 Yellow Jacket	15½

Mining Share Market.

An unusually weak and dull markot has been tbe foature of affairs for the past week. Sales have neither been rapid nor large, nor have the fluctnations been remarkablo. A feeling of confidence seems, however, to be prevalont, as we go to press, especially in tho Comstock, the prices being helped by tho raising of ore, some 400 tons being shipped from tbe Sierra Nevada to the mills for reduction. The present aspect of the stock market may generally he attributed to the investment of capital in other branches of business, or its retention to await futuro events. It is not certainly being invested to any extent in stocks. The same feeling seems to pervade the New York and Chicago markets, and the cause may possibly be attributed to a general depression.

Seeders and Planters.

By permission of tbe Commissioner of Patents, Mr. James T. Allen has made a digest from tbe records of tbe Patent Office, of all the American patents on seeding machines and implements granted from A. D. 1800 to Jannary, 1879. Tbis volume is the only one ever published comprising this class, and bas been prepared witb great care and labor. It contains thirteen hundred and twenty-five pages, and embraces nearly four tbousand patents. Each drawing is clearly and distinctly photograpbed, and can be as readily understood as the copies furnisbed by the office. It also comprises all the reissues and additional improvements granted dnring tbe above period, accompanied with the full claim, and also brief wben found to be of service. Especial care has been bestowed on the arrangement of patents to simplify aud facilitate examinations, and to this end the patents have been arranged chronologically under the official classification of thirty-four subdivisions.

In addition to tbis are complete and convenient indexes of eacb subdivision, whereby the drawing or claim of any patent may be found by name, number or date. There are also complete lists of models saved wbolly from tbe fire of 1877, and of those reclaimed from the debris of the conflagration.

Inventors, manufacturers and attorneys will see the great advantage a work of this kind affords, particularly to those residing at a distance, enabling any one to make examinations nearly as quickly and tboroughly as if consulting the office records. The number of volnmes of tbe Digest is limited to a few hundred, most of which has been taken by subscribers. The price has been fixed at the low rate of $25 per copy, whereas the patents it contains could not be purchased for less than $375 to $400.

Those desiring copies of this exhaustive treatise are requested to send their orders at once, remitting by postal order, cbeck or draft, or copies can be sent by express C. O. D. A liberal discount is made to libraries. Mr. Allen's address is room 116, Patent Office, or lock box 699, Wasbington, D. C. Reference is made, by permission, to tbe Patent Office officials.

The Miners Jubilant.

Tbere bas been a certain depression in the mining interests during the litigation of the farmers against the miners in the mining debris snit, more particularly in tbose localities tbreatened witb immediate stoppage of work, in case of the decision of tbe lower court being sustained. On receipt of the news of the reversal of tbe decision by the Supreme Court, thus deciding the momentous question against tbe farmers, the mining communities in tbe different counties, wbere hydraulic mining is carried on, were exceedingly jubilant. At Nevada City one hundred guns were fired, bells were rung, flags boisted, bombs and crackers hurnt, and everybody rejoiced. A dispatch from Grass Valley says: "The dispatch announcing the favorable issue of the suit was received throughout the county witb enthusiasm. Cannons were fired, flags raised and fire bells rung, wbile every steam whistle in the neighborhood added to the general uproar. The streets of this place have all day been thronged with eager and excited crowds, handshaking and congratulating over the result. Even John Chinaman seemed to appreciate the situation, and in no small degree assisted in the joyous demonstration by the firing of bombs and exploding of firecrackers."

A COMPANY bas been organized at Salem, Or., to rebuild the woolen mills which were burned two years ago.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

CONKY.—*Ledger*, Nov. 15: Draining the shaft at this mine is making satisfactory headway. The water has been taken out to a point below where the timbers have to be renewed. There is still an immense body of water to be taken out; and weeks will yet have to elapse ere the work is completed. The erection of the 40-stamp mill has been fairly commenced. Some 9 or 10 carpenters are employed fitting the frame work. The company has decided not to let out the work by contract. Nearly the whole of the castings and machinery for the mill will be brought from San Francisco. The mill is to be first-class in every respect, and be supplied with steam power. The rains of the past week have interfered with the grading operations on the mill-site, and with the carpenter work. It is not probable that the mill will be in running order much before the opening of spring.

BUTTE BASIN.—How to manage the vast body of water is still an unsolved problem with this claim. A second-hand steam pump was brought from below, but was found to work badly, and had to be discarded. Another pump was obtained from Oneida, and fixed up last week, but this is not altogether satisfactory, and doubts are entertained about controling the water with present pumping facilities.

KIRKENDALL DISTRICT.—This new mining district is situated about four miles from Ione City, and is rapidly assuming a prominent place among the gold-producing districts of this county. It is located away to the west of what is known as the mother lode. The Sacramento and Kirkendall ledge is said to be 30 ft wide, the value of which, as shown by actual assays, ranges from $7.50 to $20 per ton. The owners are having a smelter erected, with a capacity of 12 tons per day. This smelter will be ready to commence operations in a few days. Other promising claims are the Peggy Gordon, Woodland and Lone Star—all rich in gold according to assays.

SOUTH SPRING HILL.—At this claim, near Amador City, a shed, 30x30 ft, has been erected over the hoisting works. The hoisting works consist of a patent horse power, all made of iron.

VOLCANO ITEMS.—The big tunnel is being pushed along as fast as circumstances will permit. The work has been retarded considerably of late on account of bad air, and it has been found necessary to put in air pipes for ventilation. The rock in the face of the tunnel is very hard, and progress is consequently slow. At the Golden Gate mine, a three-ft ledge of rich ore has been struck, and the prospects for a paying mine are excellent. The mill is being hurried up.

VICTORIA.—The contract for sinking the shaft is completed. The shaft is now down 260 ft. No ledge is visible, although in sinking, large boulders of quartz would come in from time to time, and then pinch out. The contractors had good sinking ground, and made fair wages The Victoria has the finest shaft in this section. It is 7x4 in the clear, timbered in the most substantial manner. Over the shaft there is an excellent whim. It is proposed to crosscut for the ore body, which is thought to be close to the shaft.

REBER MINE.—At the bottom of the old shaft some fine-looking quartz was found, the ore showing from three to four ft in width. In sinking also, some rich rock was encountered. There is a strong flow of water in the shaft, which is too much to be controled by windlass. The shaft is 60 ft deep.

PIONEER.—Splendid ore has been taken out of this claim. Some specimens are sprinkled with free gold, and the estimated yield of the rock is placed at $20.

THE WEBSTER.—Is making slow progress. No ledge of any size has been met with as yet. Small strata of quartz are occasionally cut, some of them rich, but not rich enough to follow.

BALDWIN.—This is situated on the Middle Fork of the Consumnes, and is turning out quartz of fine grade. Several other mines near Nashville are also panning out pretty well.

PHOENIX.—This grand mine is turning out its usual quantity of gold. The mill is running to its full capacity. The south shaft is now down 1,200 ft, the contractor having 40 ft more to sink to form a sump. At present the men are cutting out a station. The slate is very hard.

CALAVERAS.

MAMMOTH.—Work was commenced on this hydraulic last week.

SAFE DEPOSIT.—Important improvements are making at the Safe Deposit mine, Old Woman's gulch. A new tunnel has been run to tap the channel further down the ridge—low enough to drain the mine without the expense of pumping. The new tunnel will be about 350 ft in length; is already run to the outer edge of the channel and will be completed in a few days. The mill belonging to the mine is being moved to the mouth of the new tunnel and will be in readiness for crushing the gravel by the time the mine is "in fix" for taking it out.

EL DORADO.

ROSE.—*Republican*, Nov. 13: In the Rose mine, connection between the 200 and 300 levels have been made, and a fine body of rich ore has been developed. Sinking will now be resumed and the further development of this ore body carried on at the same time.

P. O. Q. MINE.—At the P. G. Q. mine (Old Pacific), work upon the mill and hoisting works is being driven as rapidly as possible, and about six weeks more will probably find them completed, when a large additional force will be put in the mine. Before spring the company will have about 60 men in its employ.

ROSECRANS.—At the Rosecrans tbe hoisting works have been in operation about two weeks, and the mill is about completed and will probably be started up the last of this week, perhaps sooner. Sinking is now in progress and there is no doubt about the mine being a good paying one.

ROBINSON.—The Robinson gravel mine, which has yielded its millions in the past, is now surpassing its previous yield, a new pay channel having been developed. In this mine the gravel is found about 100 ft below the surface, and is milled. The last clean-up, after seven days' run, produced $8,200, and the indications are that this rate will be kept up for some time.

MONO.

NOONDAY COMBINATION SHAFT.—Bodie *News*, Nov. 16: The shaft is now down 503 ft; progress made during the week, 16 ft. The rock is hard but breaks well. The water is easily handled, and has not increased as depth is gained. The east crosscut from the 312 level is in 172 ft; formation favorable; progress made during the past week, 30 ft. Drift south on vein No. 2, same level, in 112 ft; progress during the week, 23 ft. The ledge is three ft wide, the ore of high grade. Drift north, same vein and level, in 87 ft. The ledge is four ft wide of good milling ore. On the same level, drift No. 1, south on vein, in 155 ft. Ledge three ft wide of clear, bright, good milling ore. The drift south on the 212 level in the vein 138 ft. The ledge large and strong, fully six ft wide of high-grade ore. The machinery is working well. The arrangements for working this mine are perfect and complete, and give evidence of that experience so essential to the proper development of mining properties. The new boilers for the works will arrive on Tuesday next, when they will be immediately set up and utilized, and two new steam pumps placed in operation. The mill, when finished, will be one of the most complete 30-stamp mills on the coast, fitted up with every standard improvement, and specially adapted to working ores upon the most economical principles. The six batteries of five stamps each, furnished with automatic feeders, are all in position and ready for work. There are 42 settling tanks of capacity to run the mill 24 hours without waste, with 24 pans and 12 large settlers all in position, fully geared and ready for work, each furnished with a hydraulic quicksilver discharge, receiving the quicksilver from the settlers and discharging it to the pans without handling. The three boilers, each 56 inches by 16 ft, with huge steam drums, are all set. They are arranged to work singly or together as required. The engine, a large Corliss, is set upon a firm foundation of solid stone masonry, and will be all ready to run by the first of December. A large stock of soda and salt is on hand ready for use in amalgamating. The assay and melting department will be a model of convenience when completed.

SYNDICATE.—From 12 to 15 tons of ore are extracted daily from the Concord ledge. This and the Taylor ledge continue to yield all the ore the mill can crush. Work will be resumed in the drifts on both veins in a few days. The Isabella drift has been advanced 24 ft; total length, 250 ft; but no ledge as yet.

BECHTEL.—Drifting north on the main vein from the 200 level. Have made an upraise from the 200 level, and sunk from the old San Antonio shaft. The connection is now made, making the level about 300 ft from the surface at the shaft. The ledge shows good ore from the surface down.

UNIVERSITY.—Shaft down 199 ft; bottom in hard birdseye porphyry. A seam of fine looking quartz, about two and a half inches in width, has been cut in the north end of the shaft, which widens in going down.

SPAULDING.—Are busily at work raising and closing in the mill building. The pan frames are now up, a portion of the machinery is now on the road from Carson, and the whole will be shipped by the 25th inst., when milling the ores from the mine will be commenced as soon as the mill can be completed. The new find of this company is undoubtedly one of great importance to Silver hill, being of good milling ore, large and strong and free from foreign matter, and the formation giving assurance of permanency, the assays running from $15 to $1,200 to the ton.

SUMMIT.—*Chronicle*, Nov. 15: The ledge in shaft is four ft wide, but somewhat broken up.

BLACKHAWK.—The drift east at bottom of winze below the 320 level has been advanced five ft, making a total of 42 ft. In this drift a six-inch vein of quartz, assaying $25, was cut this week.

RIO CLOUD.—Drifting south on the 250 level on the Red Cloud ledge, and now in about 305 ft, with a large ledge of low-grade ore. The upraise is in 45 ft, in a large ledge of same material as above.

NEVADA.

NORWICH QUARTZ.—Grass Valley *Union*, Nov. 15: A shaft is being sunk on the Norwich ground, on the east bank of Wolf creek, at Boston ravine. The shaft is now below the bed of tbo creek, and is being sunk perpendicularly to strike the angle of the ledge, which is expected to be reached in about 12 ft more. The shaft is in firm blasting ground. Stringers have been cut in the shaft which prospect well in gold. A horse whim is used in keeping the shaft free of water.

STRIKE IN THE PROVIDENCE.—*Transcript*, Nov. 15: It is reported on the streets, and probably on good authority, that a very rich strike was made between the 700 and 800 levels of the Providence mine last Wednesday. The extent of the rich ore body has not been determined, but there are pretty strong indications that there is a good deal of it. From average specimens taken out, which are alive in free gold and sulphurets, it is reasonable to estimate that the rock will mill as high as $10,000 a ton.

NEW YEARS MINE.—The New Years mining company, on Deer crock, between the Providence and Merrifield are pushing the tunnel ahead, and developments recently made are of such a satisfactory character that we understand the erection of works on the claim at an early day has been about determined on.

AMERICAN HYDRAULIC MINE.—The American Hydraulic company, of San Juan, have recently effected a passage through a mass of heavy boulders, and are now again in rich gravel.

MINING AT CAMPTONVILLE.—The Pittsburg gravel company are drifting with good prospects ahead of unearthing a rich gravel channel. Burrell, McLillan & Meek, Camptonville tradesmen, ran a tunnel 1,000 ft in bedrock, but not striking pay, discontinued work there and started another tunnel below, and in 100 ft discovered a rich gold field. All the adjoining mining companies are preparing for water season.

MERRIFIELD MINE.—*Transcript:* The Merrifield mine is turning out a high-grade ore, and its prospects for becoming one of the heaviest producers on the coast, are daily growing better. The three-ft ledge on the 000 level is shown by specimens at the assaying offices to consist of over 80% of sulphurets, and pays about $45 per ton above all expenses, by the chlorination process.

STRUCK THE LEDGE.—The Bulldoser mine, on Deer creek, is proving to be what was expected of it. It is now about three weeks since Messrs. Rogers, Ragan and the Honsinger Bros., the owners, commenced to erect the steam hoisting works, performing all their own labor. The machinery has been in operation several days, and now runs smoothly. Tuesday the incline had reached a depth of 40 ft, when the main ledge was tapped. It is found to be from 15 to 20 inches thick, and for the seven or eight ft that shows in the bottom of the incline is very rich in sulphurets. Water comes in rapidly, but is easily handled by the pump. The extraction of ore has already been commenced, and a good-sized crushing will soon be on the dump.

MOUNTAINEER MINE.—Nevada City *Transcript*, Nov. 8: This mine is situated 300 ft east of the Merrifield. Two tunnels have been run from the creek, along the ledge some of the way. The upper one is 275 ft long, and the lower 300 ft. A winze has been sunk a distance of 75 ft and 10 tons of ore that milled $12 a ton taken out. The ledge is from two to two and one-half ft thick.

SHASTA.

COPPER CITY.—A writer in the Reading *Independent*, of November 13th, says: Mining interests are looking better. The Extra company have got down to solid work again after the two weeks' stoppage on account of quicksilver. They have struck some ore which is quite rich, but it contains base metals enough to make it difficult to mill. Specimens of this ore are occasionally obtained which contain beautiful leaves of free silver.

SIERRA.

ORIENT PLACER MINE.—Nevada City *Transcript:* The Orient placer mine, situated in Negro Tent mining district, this county, owned by Powell, Delmake and others, of North San Juan, includes about 424 acres of ground. A tunnel has been run into the mine about 550 ft, and good paying gravel has been struck, but it was found the tunnel is not low enough. For the purpose of determining at what depth a new tunnel shall be run, the owners intend to commence sinking a shaft on the claim to the bedrock.

TUOLUMNE.

SAN GUISEPPE MINE.—*Democrat*, Nov. 15: The owners of this mine, since the fiasco with the Chick party, made arrangements with a number of miners to work it and entered into a lease. The work is now prosecuted constantly and the miners are perfectly satisfied with their lease. They are sinking and have gone down 60 ft. At the same time, ore is being taken out of a level, which they are milling. The first clean-up was made last week and yielded $40 to the ton. Equally as good rock is now being milled. The parties working are of the opinion that it is a valuable mine; the more it is worked, the better it promises. There is every prospect that with good management, the property will pay handsome returns in the future.

ITEM.—J. A. Davis is driving the incline on the Rodger's vein in Piety Hill, with strong hope of running into a bonanza. The vein looks well.

NEVADA.

WASHOE DISTRICT.

CON. VIRGINIA.—Gold Hill *News*, Nov. 18: Crosscut No. 2, 1850 level, has reached a length of 75 ft, and has been stopped for the present on account of indications of water. The winze from the 1500 level has reached a depth of 82 ft, passing through low-grade ore. From this point a drift has been started easterly to meet that from the raise above the 1650 level. This connection will be made from both directions. The south drift, 2150 level, is in 470 ft and is cutting a vein formation showing some quartz. The drift from the bottom of the joint Best & Belcher winze to meet the last named drift is in 90 ft in hard rock, showing some water.

CALIFORNIA.—The drift north from crosscut No. 1, 850 level, has encountered some water and work there has been suspended to allow it to run off. The raise from crosscut No. 3, 1750 level, is up 43 ft. The north winze is cutting a heavy clay formation carrying some ore. A hoisting engine has been placed at its head since last report. The north drift, 2250 level, is in 65 ft and has passed into a soft vein formation showing streaks of quartz The pumps at the C. & C. shaft handle readily all the water of the shaft and that sent to them from the north.

MEXICAN.—The north drift, 2300 level, is now in a very favorable formation, consisting of rotten birdseye porphyry; total length from the south line, 70 ft. This drift is being pushed with all rapidity for the joint Union winze, and at the same time a drift from the Union shaft is being pressed forward to connect with it also. This connection, when made, will open up a new thoroughfare between the Union and Ophir shafts 300 ft deeper than the one now in existence, and will furnish another and an excellent ventilated base for crosscuts to open up the entire stretch of ground from one shaft to the other, and of which the first is that west on this level, joint with Ophir.

OPHIR.—The main incline has reached a depth of 145 ft on the slope below the 2400 station and has passed into a soft vein formation carrying quartz and dipping to the east. The west crosscut, 2400 level, is 154 ft west of the main incline and continues in favorable vein material. The joint Mexican west crosscut, 2300 level, is in a likely vein formation carrying streaks and bunches of fair-grade ore; total length, 80 ft.

HALE & NORCROSS.—The crosscut west on the 2100 level was this morning in 70 ft, and in quartz and porphyry mixed, having passed through the porphyritic rib mentioned in Monday's letter. The crosscut on the 2200 level is following up the diamond drill hole toward the point where the rod broke. The face is also in a mixture of quartz and porphyry.

GOULD & CURRY.—The joint east crosscut, 1700 level, is averaging five ft per day through hard, dry rock; total length, 1,590 ft. At the O. & C. and B. & B. shaft the water is being lowered rapidly, and the lift pump for sinking will be in place in a day or two and everything ready to resume sinking.

SIERRA NEVADA.—The north drift from the 2400 station of the incline is now in 18 ft and in vein matter. The crosscut west on the 2300 level has its face all in good ore and is looking well. The crosscut is to be pushed to the west wall of the ledge. A diamond drill is running east in the crosscut, 2200 level, from the east shaft.

UNION CON.—The drift south of east on the 2400 level and from the Union shaft, is in 63 ft, and the work of timbering it up is not yet completed. The south drift on the 2300 level from the Union shaft is being pushed with all energy to reach the joint Mexican winze and to make connection with that from the Ophir incline running north in Mexican ground on this level. It is now in soft vein matter carrying quartz, its face 170 ft from the station.

SILVER HILL.—The crosscut east, 1300 level, is in 730 ft, and in a very favorable formation, carrying some water, but not enough to hinder work. The prospects ahead of this crosscut continue to be favorable. It will be continued to the east clay of the vein, where the indications are that ore will be found.

BULLION.—The incline winze from the 2150 level has attained a depth of 238 ft on the slope and continues to penetrate hard vein matter. The east crosscut on the 2400 level has reached the edge of the pure quartz formation and has penetrated a mixture of clay, quartz and porphyry which is very soft, and carries some water, but not enough to interfere with work.

NORTH BONANZA AND FLOWERY.—In the Flowery drift south, 300 level, a change for the better is noticed, and prospects there are improving. Some bunches of good ore have been encountered on the 400 level by the drift running south. In North Bonanza, on this level, an improvement is also reported.

GLOBE CON.—The ledge formation referred to last week has been cut through. It is 50 ft in width, and gives good assays in gold. The formation now encountered is hard, blasting porphyry. It works well and progress is very satisfactory.

ANDES.—The drift north running from the crosscut west on the 350 level, continues to show fine-looking quartz, but of low grade. The lateral drift, 450 level, is in good vein material.

BELMONT DISTRICT.

BELMONT.—*Courier:* The drift running north from ore body, south of shaft, was extended 18 ft, since last report, through a three-ft vein of quartz, nearly half of which is good milling ore. They have about 35 ft farther to run the drift to make connection with the old incline. This ground is opening up splendid, and from which they will get a large amount of pay ore. The ore dumps at the mine are about all full, and unless they make more room, will soon have to commence milling ore. They are now putting in ore chutes in Nos. 2 and 3 raises, north part of the mine, preparatory to commence stoping.

ALEXANDER.—The mill is running well. The ore body in the mine is immense. A strike was made in the upraise of the fourth level, disclosing an immense body of high-grade ore.

DISCOVERY.—John Delarbar made quite a rich discovery in his mine north of town last week. While sinking a shaft he struck a good-sized ledge, and some of the ore extracted from it assays away up in the hundreds.

ALEXANDER MINE.—*Courier*, Nov. 15: Sufficient ore is being taken from the open cut on the surface to run the 20-stamp mill, and this is so easily extracted that three men can keep the mill supplied with ore. This cut is over 60 ft wide and is all ore; in fact, the whole hill seems to be nothing else.

PARADISE DISTRICT.

BIG NICK.—Winnemucca *Silver State*, Nov. 17: Work on this mine is being pushed ahead, and the claim is reported as looking better at present than at any prior time since its discovery. The ore vein is now nearly four ft wide, and is rich in silver. We understand it is the intention of the owners to have some of the rock worked shortly.

MARY WILDER.—This new discovery recently made in the mountains west of town, is proving to be richer than was at first supposed. Every strike of the pick develops rich mineral, and old miners and prospectors say it is by far the richest strike that has ever been made in this section. There are now several hundred tons of rock in sight right on the surface, which assays all the way from $100 to $700 per ton.

ARIZONA.

STONEWALL MINE.—*Silver Belt*, Nov. 8: This mine, at McMillen, Pinal county, is now looking better than it ever has since its discovery. In one of the lower levels a large body of ore worth a dollar or two per pound, some of it assaying as high as 80%, has been struck. It shows on both sides of the winze a depth of 20 ft, and is over two ft in width. This strike is on the main ledge. The stratum which gave the mine so much prominence is again being worked and is yielding large quantities of native silver—$2,000 and $3,000 are daily being taken from it. One shot this week blew down over $2,000. From one charge of a pan in Stonewall mill from ore taken from strike on the main ledge, 500 pounds of amalgam was taken, worth over $1,200. The main shaft is now down 235 ft and is in ore.

ITEM.—Harrod & Medler struck a body of low-grade ore on the Mississippi and Flor At mines. The lead is about 30 ft in width. It is the Stonewall Jacksou lead, and the claims are about centrally located between the Stonewall and Chromo mines.

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Carbonate Ore Fields.

A late issue of the Leadville *Chronicle* contains an interesting article from T. A. Green, upon the subject of the "Carbonate Ore Fields." Mr. Green says:

There are three things which seem to have been absolutely necessary to the formation of our immense carbonate veins or beds, viz.: Carboniferous limestone, porphyry and intense igneous action; and there are four things to look to in order to find our carbonate veins or beds—alternating layers, or strata of lime and porphyritic rock, igneous or heat action, and heavy beds or veins of iron. The iron in these mines is the matrix or gangue mineral, bearing the soft carbonates, and it may be found above, below, or running through the soft carbonate veins or beds, or it may be so strong in places as to cut out the soft carbonates. And then again the whole vein may turn to soft carbonates. If I am mistaken as to the iron being the matrix or gangue, it anyhow accompanies the soft carbonate everywhere, and in all veins, beds or deposits—the three metals have been formed in the same veins or fissures—lead, silver and iron. A large part of this iron is nonhematite, or specular and comprised of about 70 parts of iron and about 30 parts of oxygen; but originally it was all carbonate of iron, and has, in the course of ages, grown or changed into its present form.

Now, in order to find rich veins or beds of carbonates, look for heavy alternating layers of lime and porphyritic rock, heavy beds or veins of iron and igneous action—the greater the signs or evidences of igneous or heat action the better. I examined the Loveland mine on Mosquito mountain a short time ago, and I found much of the mineral like the cinders of a furnace. This was a good sign or indication, and although I found no carbonates, the mine promised to be very rich in other forms of silver ore. In fact, so far as then developed, it was a most remarkable mine.

The first and most important rule I can lay down for the guidance of the prospector, is to find out from the outcrop on the side of the hill or mountain, and from other shafts in the neighborhood, if there are any deep enough, where the contact is, or as near where it is as possible, as he must not expect to find rich beds of carbonates except at or near a contact. To illustrate: I went out to examine a certain mining locality on the side of a moderately steep hill or mountain, and I found a heavy porphyritic stratum about 200 feet in thickness, cropping out all along—or rather around—the side of the mountain, and a number of prospectors had commenced work on the very top of this thick stratum, where they would have to sink at least 200 feet before they could possibly strike a contact and mineral, and work all the way through this hard rock by the slow and expensive process of blasting, which was enough to dishearten and discourage almost any poor prospector. I then went down the side of the mountain till I thought I was quite 200 feet perpendicularly below where the miners had commenced their shafts, and I could clearly trace a well-defined contact for half a mile around the mountain, and although this contact was slightly covered with drift beyond that, yet it could be approximated for a mile further. Now, if these miners had examined for this contact, which they could have easily found, and made some cuts along the edge of the contact, or sunk a few shallow shafts and then drifted in on the contact, they would soon have either struck mineral or have proved that there was none there. About two-thirds of all prospecting work done in this camp is wasted in the manner above stated; and I maintain that this could be avoided by a little judgment and experience. There are also hundreds of miners in this camp prospecting entirely outside of the carbonate belt where they cannot possibly find rich and paying beds of carbonates. A rich mining belt like this will throw out pockets and small veins for from five to ten miles on all sides, and throw out a coloring; but unless heavy and alternating layers or strata of lime or porphyry, and an abundance of iron are found, I do not think there is much use prospecting for carbonates, but other kinds of gold and silver ores may be found. Porphyry alone, or limestone alone, or mere fragments of both will not do, nor will mere stains and traces of iron do.

The grander the scale on which you find porphyry, lime and iron, the better your chances for rich carbonate beds.

Almost any miner ought to be able to distinguish lime and porphyry; but there is white lime rock in some places that looks very much like porphyry, and besides nearly all the rock of which these vast mountains are built is metamorphic; but still the miners may learn to generally distinguish lime from porphyry; and this is important.

It seems to be a disputed question both amongst our experts and our courts as to whether our carbonate veins are vertical or horizontal, and in a legal point of view this is a very important question, but it is very strange indeed that there should have ever been any doubt or controversy about it, at least as a scientific question. No horizontal veins of coal or any mineral run on an exact horizontal level; all such have various dips and many undulate like waves, or a rolling surface. Judge Hallet has defined a vertical vein to be any variation—an inch or a foot—from a horizontal line. This substantially decides that there is no such thing as a horizontal vein of coal or any other kind of mineral on the globe. It might just as well be said that any variation from a vertical line—an inch or a foot—is a horizontal vein, and then there could be no such thing as a vertical vein on the face of the globe. The able and learned Judge was certainly mistaken in his definition, and will yet correct it, as important legal rights depend on it; millions of dollars in this camp hang upon that definition.

As these carbonate veins or beds of mineral are wedged in between great horizontal layers or strata of lime and porphyritic rock, how can they possibly be vertical rocks? It is true that where carbonate veins outcrop in the sides of the mountains they may have a heavy dip until they get under the heavy portions. The mountains in settling back were much heavier in the center than at the edges and sides, and consequently the veins are pressed down further in the centers of the cones or mountains, and they bow up at the ends or outcrops on the sides of the cones or mountains. Therefore the veins dip rapidly for the first few hundred feet going into the mountain on either side. When these cones and mountains were first upreared they were also looser in the center than at the sides, and pressing down these metallic veins in the center with them. It must be remembered that even these "everlasting mountains" are not altogether firm and stationary, but have been gradually settling down for millions of ages, and are still settling down. They are also being gradually dissolved and worn away on their sides and tops by the elements around them and the rains and snows upon them, and all the rocks of which they are built are continually changing by the chemical agencies in operation both within and around them.

The forces of nature which operated here and upheaved the vast amphitheater of hold, rugged, snow-crowned mountains, and cut them into cones, gulches and great chasms, were on a grand scale, and it was the same grand forces of nature that prepared the openings and great fissures in the rocks to receive our immense mineral deposits; and the chemical agencies or elements which operate in the vast laboratory of the earth to fill these great openings and fissures with mineral were also on a grand scale, and the man who thinks these wonderful agencies only operated in a few spots here and there, and that these particular spots have all been discovered, has but a poor conception of the forces, laws and chemical agencies of nature and of the earth. Even the immense iron boulders, some of which are almost as large as a small house, scattered all over this carbonate belt, and the great ledges of iron that crop out in places on our cones and mountains, stamp this as one of the grandest mineral belts in the world. This alone is sufficient evidence of the grand scale on which these mineral deposits have been gotten up. The further fact that there are carbonate veins or beds developed here from 200 to 300 feet in width, and from 25 to 50 feet in thickness, and which seem to be almost inexhaustible, attest the grand scale of this whole mining belt, and the chemical agencies which operate here to produce them.

To Vulcanize India Rubber.—The vulcanizing process, patented by the late Charles Goodyear, consists in incorporating with the rubber from 3% to 10% of sulphur, together with various metallic oxides, chiefly lead and zinc, the quantity of the latter articles being regulated by the degree of elasticity, etc., required in the desired article. The goods of one large establishment are vulcanized in cylindrical wrought-iron steam heaters over 50 feet long and from 5 to 6 feet in diameter. These heaters have doors opening on hinges at one end, and through these doors the goods to be vulcanized are introduced on a sort of railway carriage, then, after the door is shut, steam is let on, and a temperature of from 250° to 300° of heat is kept up for several hours, the degree of heat being ascertained by means of thermometers attached to the heaters. The value, solidity and quality of the goods is much increased by keeping the articles under the pressure of metallic molds or sheets while undergoing this process. The whole process requires careful manipulation and great experience to conduct it properly.

Singular Cave.—The *Courrier de Tlemcen* (near Algiers) states that some miners occupied in blasting rocks in the vicinity of the picturesque cascades, discovered the entrance to a cave, the floor of which was covered with water. They ventured upon the subterranean river on a raft, and followed it some 60 meters distance, when it disappeared in a vast lake. Here the vault of the cave was very high and covered with stalactites. In many parts the miners had to steer their raft between colossal stalactites which reached down to the surface of the water; eventually they reached the end of the lake, where they noticed a canal extending toward the south, and into which the waters of the lake flowed. The workmen estimate the length of the lake to be two miles and the breadth about one and one-eighth miles. They brought out a quantity of fish, which, they say, surrounded the raft, and which were found to be blind.

Emigration of Potters.—A pottery firm in Staffordshire, England, have decided to remove their seat of manufacture across the water with a view of locating in Philadelphia. Arrangements are now being made to close up the home works, and the workmen are preparing to settle in a new land. The party will, in all probability, arrive here before Christmas. Several owners of potteries are considering the desirability of permanently settling in the United States.

Fish Farming in Nevada.

The average citizen of eastern Nevada, says the Eureka *Leader*, has but little conception of the mammoth proportions that the fish industry and culture is assuming under his very nose. We say culture, from the fact that fine fish are not a native of Nevada, and like other imported articles, whether of the finny tribe, or what not, have to be brought from abroad, tended and raised with much care. All of this is a preface to what the *Leader* has to say in regard to the aquarium of H. C. Fenstermaker. Mr. Fenstermaker owns a tract of 600 acres of land, 20 miles directly south of Eureka, at the head of Fish creek. In other words, Fish creek rises on his premises from numerous springs, which center and make the stream some 80 rods before leaving his property, in an easterly course, thence finding its way towards Mr. Page's ranch and Pancake valley. His dominions are surrounded on either side by tall mountains, partly wooded, and it would seem that the valley had at one time been an immense lake, which, by natural changes, had become overgrown by vegetation, large and small springs alone being left as an outlet to the immense body of water that finds its way through the valley by subterranean passages, breaking out here and there as above described. There are some 12 large flowing springs, with about 15 lesser ones, making a chain of lakes that would float a small clipper ship. About two years ago, Mr. F. conceived the idea of raising fish, and, with this object in view, procured from United States Fish Commissioner Myron Greene, Shasta county, California, on May 1st, 1878, some 500 eggs, known as the McCloud River trout. These he put into one of the small springs, and a few days thereafter was delighted to find that they had hatched, and the water was filled with an innumerable number of little trout. These he carefully watched, but for the following six weeks they derived nourishment from the yolk, or egg, that yet remained immediately under their throats. After this they were carefully fed on the yolks of eggs, grated liver, etc., until they had gained a little age and strength, when they were removed to a larger spring and allowed to care for themselves, subsisting on little chubs, shrimps, etc., which are natives of the springs. The trout being of the voracious nature of the shark, rapidly grew, and to-day they will weigh from two to four pounds. It is estimated that they grow about one inch every month.

Mr. F., being encouraged with his experiment, and also learning much from observation and reading, again sent and received 10,000 eggs from the same place, and was gratified to see them nearly all hatch, and about a month ago transferred the little fellows from the hatcher to the large lakes. The hatcher somewhat resembles a sluice box for placer mining. It is a trough about one foot square, with cleats at intervals on the bottom, over which a small current of water is allowed to run. Last March he secured 37 small carp from a fish grower in Sonoma county, Cal., paying $75 for the same. This species of the finny tribe, hatches so soon that they alone are transported when young. Those placed in these springs have since spawned, and are doing nicely. Last April he sent and got 22 little catfish (frys), which he placed in his springs, and to-day the largest will weigh over four pounds. At the same time 12 small gold fish were secured as an experiment. They are also doing well, but their future is yet to be learned.

In these lakes Mr. F. has upward of 11,000 fish, a large majority being of sufficient size to be marketed. Arrangements have been made for 45,000 Lake Michigan whitefish spawn, which will be here about the last of November, and also for a lot of soft-shell turtle and different species of the bass. Mrs. F., who is a great enthusiast on the fish question, takes much pleasure in tending her different finny bevys, many of the larger fish being regular pets. It is well worth one's time to make a visit to this ranch of lakes and fish, and the industry promises to be a most remunerative one. The fish can be raised with little trouble, and when a few weeks old find plenty of food in the rich mud grass, chubs and shrimps that surround and inhabit the lakes. The springs look beautiful, and even at this late day of the season there floats on the water's surface a green, viney vegetation resembling lettuce, which the fish eat and gambol about, often springing several feet out of the water. One can have no conception of the attraction here afforded the curious, unless by personal observation, and our readers have but little idea of the magnitude of the enprise.

New York Inventors' Institute.—Peter Cooper has passed over $30,000 to the Cooper Union, in New York, for the purpose of adding another story to the building, which will be occupied by the Inventors' Institute. The work will be completed by December. The object of the Inventors' Institute is to give the inventors the free use of a library of all the works which they may desire to consult.

Steam on Canals.—Locomotives are used on canal towpaths of France. They are of light build, not weighing over four or five tons, and are managed easily by one man. Barges are thus drawn at a speed of two miles an hour—about twice the mean rate of a horse on the towpath. An empty vessel is drawn six miles an hour, but a greater speed would damage the banks of the canal.

Traveling Rocks in Canada.

Lord Dunraven, in an article in the *Nineteenth Century*, thus describes a curious phenomenon observed by him in Canada: A strange scene, for example, which came within my observation last year, completely puzzled me at the time and has done so ever since. I was in Nova Scotia in the fall, when one day my Indian told me that in a lake close by all the rocks were moving out of the water—a circumstance which I thought not a little strange. However, I went to look at the unheard-of spectacle, and, sure enough, there were the rocks apparently all moving out of the water on to dry land.

The lake is of considerable extent, but shallow and full of great masses of rock. Many of these masses appear to have traveled right out of the lake and are now high and dry some 15 yards above the margin of the water. They have plowed deep and regularly defined channels for themselves. You may see them of all sizes, from blocks of (say), roughly speaking, six or eight feet in diameter, down to stones which a man could lift. Moreover, you find them in various stages of progress, some 100 yards or so from the shore, and apparently just beginning to move; others half way to their destination, and others again, as I have said, high and dry above the water. In all cases there is a distinct groove or furrow which the rock had clearly plowed for itself. I noticed one particularly good specimen, an enormous block which lay some yards above high-water mark. The earth and stones were heaped up in front of it to the hight of three or four feet. There was a deep furrow, leading down directly from it into the lake, and extending till it was hidden from my sight by the depth of the water. Loose stones and pebbles were piled upon each side of this groove in a regular, clearly-defined line. I thought at first that from some cause or other the smaller stones, pebbles and sand had been dragged down from above, and consequently had piled themselves up in front of all the large rocks too heavy to be removed, and had left a vacant space or furrow behind the rocks. But if that had been the case the drift of moving material would of course have joined together again in the space of a few yards behind the fixed rocks. On the contrary, these grooves or furrows remained the same width throughout their entire length, and have, I think, undoubtedly been caused by the rock forcing its way up through the loose shingle and stones which compose the bed of the lake.

What power has set these rocks in motion it is difficult to decide. The action of the ice is the only thing that might explain it; but how ice could exert itself in that manner, and why, if ice is the cause of it, it does not manifest that tendency in every lake in every part of the world, I do not pretend to comprehend. My attention having been once directed to this, I noticed it in various other lakes. Unfortunately my Indian only mentioned it to me a day or two before I left the woods. I had not time, therefore, to make any investigation into the subject. Possibly some of my readers may be able to account for this, to me, extraordinary phenomenon.

Hydraulic Mines Enjoined.

It is said by the Grass Valley *Union* (Nevada county), of the 8th inst., that a report was brought down from the Ridge on the 7th, "coming from what was believed to be good authority, that an order had been issued to stop work in the mines of the Milton and Eureka Lake companies, and to shut off the water from the canals of those companies. It was not known whether similar instructions had been given by the North Bloomfield company. These orders were said to be in consequence of the writs of injunction granted against the hydraulic companies by Judge Keyser, in the instance of the suit of the city of Marysville. The three companies named are the heaviest gravel mining incorporations of the county, and if it be true that they have shut down, and will remain so for any length of time, or during the pendency of the suit, the effect upon the business interests of the Ridge will be seriously and unfavorably felt."

If the above report be true, it indicates that the solution of the debris question is well under way. The mere fact that a restraining order has been granted cannot indicate in any respect the leaning of the court so far as a final decision upon the merits is concerned. Besides, the injunction at this stage of the case would be only preliminary, and might have been granted *ex parte*, in which case it would be apt to be set aside on motion. In any other view a substantially strong case would have to be made out before the court would grant the order.

It may possibly occur that there are exceptional cases where the accumulation of mining debris through hydraulic mining has caused sufficient damage to enable the court to perpetually enjoin on a final hearing. But any decision will necessarily be founded upon the facts in every particular case, and can have no general bearing upon the question as to whether hydraulic mining is a universal public nuisance.

It will require some action on the part of the Legislature to fully determine the rights of both parties, and that such action will be taken by the next Legislature is quite certain, if we may judge from the pressing necessities of the case.

The Engineer.

Iron in Engineering.

The rapid development of the railway system from its initiation by George Stephenson in 1830, has called out all the resources of the engineering mind, and led to bridges and viaducts of great boldness and skill. One of the most celebrated of these is the tubular bridge over the Menai, having two spans of 460 feet and two of 230 feet each. A vast amount of experiment, calculation, and research was expended on this design, which no doubt answers its purpose, but with an expenditure of material and an unsightliness of effect which seems to have deterred others from following in its wake. The lattice railway bridge over the Mersey at Runcorn, designed by the late Mr. Baker for the London and Northwestern line, is a fine specimen of economy of material and efficiency in the result. Specimens of railway bridges abound on every side, and have developed the capabilities of iron to a wonderful extent. The two largest are probably the viaduct over the St. Lawrence, which consists of 24 spans of 242 feet each, and the more recent one over the Tay at Dundee. The latter is the most remarkable specimen of iron-bridge building which has yet been constructed. It is two miles in length, consisting of 82 spans of various dimensions, 11 being 245 feet between the supports. The construction comprises plate, bowstring and lattice girders in wrought iron, with cast-iron columns and piers in combination with brickwork and masonry. These are, however, to be surpassed in boldness of design by that projected over the Firth of Forth, the designs for which are not yet published.

The facilities of iron, especially wrought iron, for all engineering constructions are more and more appreciated year by year, but with some few exceptions there is a great defect runs through them all in the absence of anything of æsthetic taste in the designs. The ancient motto for building was, "Strength, commodity, beauty." The first two have been attended to almost to the entire neglect of the third. "This," says J. A. Picton, G. S. A., of Liverpool, "I cannot help thinking is a great mistake. The grand engineering works with which the surface of our country is studded should have a dignified and noble aspect. They should minister to the sense of beauty and fitness as well as to that of strength and power; but too frequently the reverse is the case. I will refer to an instance or two. The railway viaducts built by Brunel over the rivers at Chepstow and Saltash are grand specimens of constructive skill, but their aspect is repulsive in the extreme. Let anyone compare London bridge, with the graceful curves of its arches and its simple, yet elegant design, with the iron bridge of Blackfriars, or, still worse, with the railway bridges crossing the Thames; the contrast will be found painful in the extreme. The railway bridge at Runcorn, by Mr. Baker, with its light iron lattice-work and the sweeping lines of the viaducts on each side, is a fine and noble structure. Telford's suspension bridges at Conway and the Menai are charming in this outline and fairy-like in their construction, while their neighbors, the tubular bridges, are the very incarnation of ugliness. This is a defect not inherent in the material, for iron readily lends itself to any shape of beauty. It rather arises from contempt or inadvertence, looking at strength and power as the only elements required."

The Severn Bridge.

The bridge across the river Severn is now completed, the foundation stone having been laid on June 3d, 1874.

The bridge is on the bowstring principle, and consists of the following spans: One of 134 feet, two of 327 feet, five of 171 feet, thirteen of 134 feet, and one—including a swing bridge over the Gloucester and Berkeley canal—of 196 feet, making 22 in all. The two spans of 327 feet are across the navigable part of the Severn, and in ordinary spring tides afford a headway of 70 feet above high-water mark. In the other cases the headway varies according to the gradient of the bridge—1 in 140. The piers, moreover, vary according to the weight they have to carry. Those bearing the wider spans consist of four cylinders, each of which is 10 feet in diameter from the foundation to low-water level, and 7 feet to the top of the pier, and upon which the girders take their bearings. The piers of the five 171 feet spans consist of two cylinders only, each nine feet in diameter to low-water mark, and from thence seven feet. The width of the river is 1,186 yards, and the entire length of the bridge, inclusive of the viaduct on the Forest shore, and the swing bridge across the canal, is 1,387 yards. It has been constructed for a single line only, although the railways, including the tunnel, have been made for a double line of rails. The total length of railway from Lydney, where the line commences, to Sharpness is about five miles. The superstructure of the bridge consists of bowstring girders resting on iron columns, and to allow of vessels passing up the canal the structure terminates on the Sharpness side with a swing bridge 500 tons in weight and about 200 feet in length. It has a double opening, and rests upon a circular tower of masonry. One of the openings of the swing bridge is across the canal, and the other over the adjoining shore of the river. The engine and machinery for turning the bridge are so arranged that there shall always be a reserve boiler, engine and machinery, to provide for repairs or in case of a breakdown. The locking is effected by iron wedges driven by steam, lifting the bridge, and causing it to take a solid bearing on the piers. The viaduct on the Lydney side of 12 arches 70 feet high, constructed of stone from the forest of Dean, is a fine piece of masonry.

Useful Information.

Misnamed Things.

The misapplication of a name in speaking of the common things of life is the source of many errors. Why things are not correctly named is probably due to the deficiency of our language in descriptive words. The *Journal of Applied Science* has this to say upon this subject:

Why should trade not have a Johnson to classify and correct the mass of inconsistencies that go to make up its nomenclature? We not only tax our brains to invent "fantastic" names for every new fabric, varied, perhaps, only by a thread or a shade from what our grandparents wore a century ago, but there are in use positive misnomers for many staple articles of merchandise. The following imperfect list, culled from sources already at hand, will give a faint idea of them:

Acid (sour), applied in chemistry to a class of bodies to which sourness is only accidental, and by no means a universal characteristic. Thus rock crystals, quartz, flint, etc., are chemical acids, though no particle of acidity belongs to them.

Blacklead does not contain a single particle of lead, being composed of carbon and iron.

Brazilian grass does not come from Brazil, or even grow there; nor is it grass at all. It consists of a palm leaf (*Thrinax argentea*), and is imported chiefly from Cuba.

Burgundy pitch is not pitch, nor is it manufactured in or exported from Burgundy. The best is a resinous substance prepared from common frankincense, and brought from Hamburg; but by far the greater quantity is a mixture of resin and palm oil.

China, as a name for porcelain, gives rise to the contradictory expressions—British china, Dutch china, Chelsea china, etc., like wooden milestones, iron milestones, brass shoe horns, iron pens, steel pens.

Cuttle bone is not bone at all, but a structure of pure chalk, once embedded loosely in the substance of certain species of cuttle fish. It is enclosed in a membraneous sac within the body of the fish, and drops out when the sac is opened, but it has no connection whatever with the sac of the cuttle fish.

Galvanized iron is not galvanized. It is simply iron coated with zinc; and this is done by dipping it in a zinc bath containing muriatic acid.

German silver is not silver at all, nor was the metallic alloy called by that name invented by a German, but has been in use in China time out of mind.

Honey soap contains no honey, nor is honey in any way employed in its manufacture. It is a mixture of palm oil, soap, and olive oil soap, each one part, with three parts of curd soap, or yellow soap, scented.

Japan lacquer contains no lac at all, but is made from the sap of a tree called *Rhus vernicifera*.

Kid gloves are not usually made from kid skins, but of lamb or sheep skins. At present many of them are made of rat skins.

Meerschaum is not petrified "sea foam," as its name implies, but is a composition of silica, magnesia and water.

Mosiac gold has no connection with Moses or the metal gold. It is an alloy of copper and zinc, used in the ancient musivum or tesselated work.

Mother of pearl is the inner layer of several sorts of shells. It is not the mother of pearl, as its name indicates, but in some cases the matrix of the pearl.

Pen means a feather (Latin, *penna*, a wing). A steel pen is not a very choice expression.

Prussia blue does not come from Prussia, but is the precipitate of the salt of protoxide of iron with prussiate of potassa.

Salid oil is not oil for salid, but oil for cleaning sallades, *i. e.*, helmets.

Salt is not salt at all, and has long been excluded from the class of bodies denominated "salts."

Sealing wax is not wax at all, nor does it contain a single particle of wax. It is made of shellac, Venice turpentine, and cinnabar. Cinnabar gives it a deep, red color, and the turpentine renders the shellac soft and less brittle.

Sperm oil properly means "seed oil" (Latin, *sperma*, seed), from the notion that it was *spermaceti* (the sperm or melt of a whale). The sperm whale is the whale that gives the "seed oil," which is taken chiefly, but not wholly, from the head.

Whalebone is not bone at all, nor does it possess any of the properties of bone. It is a substance attached to the upper jaw of the whale, and serves to strain the water which the creature takes up in large mouthfuls.

Rhinoceros horn is not horn at all, but a kind of matted or compact hair, and is only like a horn from being a protuberance on the animal's head.

Hardened Glass.—M. de Luynes has recently communicated to the French Society of Encouragement, in the name of M. de Labastie, further information on the progress which the industry in hardened or tempered glass has recently been making. He showed to the meeting numerous specimens, which presented the most varied and accurate forms. There were tubes for lamps, both gas and oil, goblets of various forms, mortars and pestles, etc. As to the latter, M. de Luynes reminded the Society how frequently accidents happened with them; the least falls break them, whereas with hardened glass they stand any amount of hard usage. He also showed capsules for pharmacy and chemistry, of all sizes and shapes, plates of glass, crystal and enamel, coffee and tea-cups in white enamel. He finished by making a striking experiment. Ordinary glasses were placed in a basket with drinking-glasses of the same shape in hardened glass; after several shakings, the ordinary glasses were all broken, while all the hardened glasses were intact. Thus it would seem that all the difficulties of the question have been solved. But, what is more important, the processes of manufacture have been simplified and combined with the ordinary operations of glass-blowing, so as considerably to diminish the expense and give more regular forms and more perfect execution. Objects made with the liquid material, when they are still red, are thrown directly into the tempering bath, and are not again heated to the melting point, as at first, which often causes a change in their form. Bottles, drinking-glasses, lamp-glasses, and other concave objects containing air, are received on a curved tube—a sort of syphon—which, at the moment of immersion, allows the air to escape, while the liquid enters the cavity without difficulty. All these improvements have been adopted at the glass works of Choisy-le-Roi, and it is confidently expected that in a very short time objects in hardened glass will be quite as cheap as those made in the ordinary way.

Imitation Oak Floors.—A simple and beautiful method of giving to floors an almost perfect appearance of oak or walnut has come into vogue in London, and is largely increasing in popularity. The method consists in putting one ounce Vandyke brown in oil, three ounces pearl ash, and two drachms dragon's blood into an earthenware pan or large pitcher; on this mixture is poured one quart boiling water, and the whole stirred with a piece of wood. The article may be used hot or cold. The boards are first smoothed with a plane and sand-papered, the cracks being filled with plaster of Paris, and then a stiff brush is dipped into the stain, and with this it is well rubbed in—the brush being rubbed lengthwise of the boards. Only a small piece is prepared at a time. By rubbing in one place more than another, an appearance of oak or walnut is more apparent. When quite dry, the boards are sized with glue size, made by boiling glue in water and brushing it in the boards hot, and on this becoming dry, the boards are papered smooth and varnished with brown hard varnish, or with oak varnish—the first-named kind wearing better, and drying quicker if previously thinned with a little French polish, a smooth brush to be employed in applying it to the boards.

Rag Packing for Valves, Bearing Springs, Etc.—This is made principally from the useless cuttings in the manufacture of India-rubber coats, when the gum is run or spread on calico foundations. Proportions as follows: Grind together useless scraps, 35 lbs.; black-lead, 18 lbs.; Java gum, 16 lbs.; yellow sulphur, 1 lb.

Good Health.

Cholera in Japan.

Dr. D. B. Simmons, of Yokohama, writes as follows to the National Board of Health in regard to the present epidemic in Japan, under date of September 3d, 1879:

The epidemic of cholera has assumed considerable proportions, having reached 100,000 cases, with a mortality of about 50%. The disease was imported from China during the summer of 1877, and in that year the number of cases was between 14,000, and 15,000, with an average mortality of about 50%. Though nearly dying out in the winter, it reappeared the next year, but the cases were comparatively few. It lingered principally in Osaka. This year it began quite early in the season, and Hioga has been the principal center from which the disease has spread over the whole empire. Within the last two months it has rapidly increased until it has reached the figures above given. Strenuous efforts have been made by the government to stop its progress in every direction. A coast quarantine was established between here and Kobe, and Osaka; but unfortunately, the disease was brought here by two steamers just before this measure was put in force. There is positive evidence that if these two steamers had not arrived the disease would have at least been delayed more than a month. Hospitals are established in every part of the empire, and sanitary measures in accordance with modern scientific ideas are everywhere being carried out. Great trouble arises from the want of a proper supply of cheap disinfectants. Carbolic acid ranges from $2 to $2.50 per pound. I have strongly advised the use of sulphurous acid, which was largely employed at Yokohama, in 1877, under my instructions, and, I am sure, with good results.

The type of the disease is rather peculiar, so that some foreign physicians denied for some time that it was cholera. Vomiting and rice water evacuations were not seen in more than half the cases, if in so many; the stools were often yellow, or green and slimy. I have seen a large number of cases, but most of them have passed into the stage of collapse. The diarrhea in the fatal cases is not often severe, but suppression of urine comes on early, followed by death in from 8 to 24 hours. I have used jaborandi and thilocarpin in many cases, and have brought on the secretion of urine frequently when the cases were not too far advanced. The reaction, when produced by these drugs, seemed less likely to be followed by secondary fever than when stimulants were used.

Is Alum Poisonous?

This question has caused a good deal of discussion. Alum is used by many bakers to whiten their bread, enabling them to use an inferior flour. It is more extensively employed as a cheap substitute for cream of tartar, in the manufacture of baking powders. It has not been considered immediately dangerous; although if continued it induces dyspepsia and obstinate constipation. But the fact that many cases of poisoning have occurred from baking powders which contained alum, puts the question in a more serious aspect, and prudent people will exercise caution in selection of baking powders.

Under what conditions, then, does this substance—formerly used only for mechanical or medicinal purposes—become poisonous? They are certainly obscure, and at present we can only surmise what they may be. We suspect that the cause exists in the individual poisoned; some peculiarity of the constitution producing a morbid change in the secretions of the stomach, with which the alum combines and forms an active poison; or the secretions may be healthy but in unusual proportions, and that these less or greater proportions, in combination with the alum, constitute a poison.

For example: Two parts of mercury and two parts of chlorine form calomel, which is not poisonous; but change the proportions to one part of mercury and two parts of chlorine, and we get corrosive sublimate, which is a deadly poison.

Then, again, we know nothing of the causes of constitutional peculiarities. Why is it that one person can eat all kinds of green fruit and vegetables with impunity, while the same course might cost another individual his life? One person can handle poison ivy and sumac without being in the least affected, another is poisoned if he approaches to within 10 feet of them. Out of a family residing in a malarial district, some of its members will suffer half the year with fever and ague, while the others will enjoy excellent health during the entire year. Foods that are wholesome to some persons are actually poisonous to others. This is especially true of some kinds of fish. There is no safety in taking alum into the stomach, as it is shown to be always injurious, and often dangerous. Baking powders properly compounded, and containing pure cream of tartar instead of alum, are more convenient than yeast; and bread and pastry made with them are just as wholesome, and far more palatable.—*Hall's Journal of Health.*

Toxic Effects of Tea.—Dr. W. J. Morton, in a paper upon the above subject, read before the recent annual meeting of the American Neurological Association held in New York, arrives at the following conclusions in relation to the use of tea: 1st. That with it, as with any other potent drug, there was a proper and improper use of it. 2d. That in moderation it was a mild and pleasant stimulant, followed by no harmful reaction. 3d. Its continued and immoderate use led to a very serious group of symptoms, such as headache, vertigo, ringing in the ears, tremulousness, "nervousness," exhaustion of mind and body, with disinclination to mental and physical exertion, increased and irregular action of the heart, and dyspepsia. 4th. The mental symptoms were not to be attributed to dyspepsia. 5th. It diminished the amount of urine, and retarded the metamorphosis of tissue. 6th. Many of the symptoms of immoderate tea-drinking were such as might occur without a suspicion of the real cause.

Enemies of Human Life.—An English paper, *Capital and Labor*, thinks that, while excessive labor, exposure to wet and cold, deprivation of sufficient quantities of necessary and wholesome food, habitual bad lodgings, sloth and intemperance, are all deadly enemies to human life, none of them are so bad as violent and ungoverned passions. Men and women have survived all the former, says the writer, and at last reached an extreme old age, but it may be safely doubted whether a single instance can be found of a man of violent and irascible temper, habitually subject to storms of ungovernable passion, who has arrived at a very advanced period of life. It is, therefore, a matter of the highest importance to every one desirous of preserving "a sound mind in a sound body," to have a special care amid all the vicissitudes and trials of life, to maintain a quiet possession of this own spirit.

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The Week.

The event of the week has been the decision of the Supreme Court in the mining debris suit, a decision virtually in favor of the miners, and removing from hydraulic mining interests a cloud which threatened total extinction. To the mining community all other news is as nothing to this in importance, and on every hand we hear of evidences of rejoicing among the miners. Although not reaching the merits of the case as to whether the miners have a right to run the debris into the streams and thus pollute the water so as to injure the plaintiff, this decision is regarded as virtually deciding the whole case in favor of the miners, as it will be impossible to prove the amount of damage that each mining company commits, or that the act of any one of them is sufficient to do the injury complained of. Besides, if the plaintiff in the case has to commence separate suits against all the parties, the process will be so expensive and slow that there can scarcely be any end to it. There is not the slightest doubt but that the miners will, in the future, as in the past, pay for *direct* damages in dumping their tailing on to the land of others, and this without any suits. They have in many instances paid more than market price for lands to be utilized as dumps. We believe that if both parties meet in a spirit of mutual concession and good will, a satisfactory settlement of this subject of mining debris will be reached without continual litigation, which is expensive and annoying to both parties.

In this city half dollars are quoted at par; trade dollars, 95 buying, 96½ selling; Mexican dollars 96 buying, 96½ selling.

A dispatch from Cape Town announces that hostilities between the Boers and Colonial authorities have been resumed.

The Piutes are in war paint at Carson, Nev., vowing vengeance against the Washoes.

California Mining Interests.

The Eastern press, with few exceptions, seems determined to ignore California in every allusion made to the mining future of the West. Whether the cause is founded upon the notion that California mines are worked out, or that Eastern capital has become so largely "stuck," so to speak, in the carbonate fields, is immaterial to the fact that our State is in many respects as utterly disregarded as if it did not exist. The golden exaggerations of some other States and Territories, when touched with the expert finger of the statistician, fall so far below even mediocrity that it is a surprise that such fabulous accounts should ever have been credited. We ought not to say that the credibility, or rather gullibility, of the Eastern press should be so easily imposed upon, for the reason that it is a trite saying that "Distance lends enchantment to the view." The inaccessibility of the mines in the comparatively new regions of the West affords a foundation for the truthfulness of the accounts of rich discoveries proportionate to the difficulty of arriving at the exact truth. The wonderful accounts of Sinbad the Sailor were very ordinary ones when compared with those of Munchausen. No person had been present who could dispute the relations of either, and so they were regarded as solemn truth by their hearers because they were indisputable. For the same reason, many of the Eastern press are in possession of the truth *a la* Munchausen. California is now quite accessible, and the charm of adventure and mystery attending the prospecting for the precious metals has dispelled the charm and diminished the claim of the marvelous, which has moved to other regions practically unexplored.

It is this spirit which moves our Eastern exchanges to lay much stress upon "Colorado, Arizona and New Mexico as without doubt the field of the future in mining enterprise, while Utah and Montana may continue to develop remarkably in respect to mineral resources."

We are unwilling to utter one word against the prospects of any of these States and Territories. The merits of every one will, however, become more manifest at some future day, when the reality of production is assumed as the basis of calculations, and not the number of mines offered for sale, and the merits of which are depicted in the glowing colors which a mine owner, anxious to sell, knows so well how to exhibit. The point that we contend for is this: That while it is so easy to know of the future of California, and that future is of such great promise, it is a mark of something else besides mere ignorance which will coolly pass her by.

The early prospectors in this State, led by the scent of gold, eagerly followed up the gold-bearing streams, imagining wisely that the source from which the placer gold came, must be enormously rich. This search led to the discovery of the Comstock lode, which absorbed the interest of the whole coast, and caused the capital that was ready for the development of our quartz veins, to flow into Nevada. Then followed the wild orgies of stock speculation, which has practically continued more or less, down to the late general depression in Comstock, which has had the effect of giving an impetus to the development of the quartz veins of California, and this too, we may say, for the first time. In all these previous years the old mining districts along the western slope of the Sierra Nevada remained dead. Some of them have been buried up a hundred feet and more beneath the debris of nature's denudations. Now these old and abandoned mines, and incipient developments of quartz veins are being rehabilitated, and are proving their stability as paying investments. There are no astounding fortunes to be made, and all the better for that. The remuneration will be endowed with greater stability and be better appreciated. A steady stream of gold has always flowed into the markets of the world from California, which is essentially the reservoir of the gold product for the country, nay, of the world. Our placers alone, fed from innumerable and yet untouched gold-bearing rock, have yielded more than three times as much gold and silver as all the gold and silver mines in the United States, and this quantity is only a drop in the bucket when compared with the gold existing in the sources of these placers. The statistics of the United States Mint demonstrate the fact that California has no competitor in gold production, and the few quartz mines which have been and are now in operation, give a faint glimpse of future capabilities. The Black Bear quartz mine has paid 68 dividends, amounting to $836,000, without a single assessment on its stock. Bodie has paid over $1,000,000, with but $20,000 levied in assessments. The Hite mine, of Mariposa, has paid $1,370,000, and the Idaho mine, at Grass Valley, $2,650,000 in 121 dividends straight along. Many of our best quartz mines are not known in stock circles—such as the Black Bear and Sheep Ranch, in Calaveras. It needs but capital and enterprise to develop hundreds more of such mines in the counties of Nevada, Plumas, Butte, Placer, El Dorado, Amador, Calaveras, Tuolumne and Mariposa. One of the best mines ever discovered is the old Hayward quartz mine, of Amador county. It was worked before the Comstock was heard of. It did not cost $150,000 to develop it to a paying basis. It has paid more than $10,000,000 above all operating expenses, and is still a good mine.

The carnival of exaggeration will soon be over, and the capital which has been so long diverted from their proper channels, to-wit: the development of the gold-bearing veins of California, is beginning to return with satisfactory returns.

Gold and Silver Product.

Director Burchard, of the United States Mint, in his annual report, just completed, estimates the total production of precious metals during the year 1879 as follows:

	Gold.	Silver.
California.....	$17,600,000	$2,400,000
Nevada.....	9,000,000	13,500,000
Colorado.....	3,225,000	11,760,000
Utah.....	575,000	6,250,000
Montana.....	2,500,000	2,225,000
Arizona.....	800,000	3,350,000
Dakota.....	2,420,000	10,000
Idaho.....	1,200,000	650,000
Oregon.....	1,150,000	20,000
New Mexico.....	125,000	600,000
Michigan.....		780,000
Other domestic sources.	305,000	67,000
Grand total for U. S. and Ter.	$38,900,000	$40,812,000

It will be seen by the estimate that in the grand total silver is in excess of gold by about two millions of dollars, it having gradually approached an equality of production for the past years. The continued output of silver from Colorado, Nevada and Utah, which is promised by the reports from mining localities, may possibly, in a few years, place silver as far in advance of gold in annual yield as gold has exceeded silver in the past.

The consequences might possibly result in the cheapening of silver and its exclusion from the market as a medium of exchange, unless the supply so far exceeding the demand should cause a partial cessation of the out-put. From the present report it appears that California maintains her prestige as a gold-producing State, furnishing, in fact, nearly one-half of the entire gold product. This production of gold occurred during a dull year, when active mining could not be considered at its highest point, and from indications of increasing developments it may be said that the amount will be larger for the next year.

In any event California seems to stand in the position of an adjuster of the precious metal equilibrium. Silver may be considerably in excess of gold in the supply, without very much depreciating in value, because it is a commoner metal, and in more general use. But the supply of gold should not be allowed to fall below the proper ratio, for the reason that a diminution of values would be likely to occur. Experience in the past has shown this to be true, and aside from experience, the law of demand and supply would demonstrate it.

The enormous supply of silver expected from Colorado and other points, will, in all probability, be more than counterbalanced by the supply of gold from California and other specially gold-producing regions.

A Swindling Land Scheme.

A dispatch from Denver brings the information that Sidney A. Grant and A. F. Wilson were arrested in Denver a few days since for conducting a fraudulent scheme through the mails under the name of the "Denver Land Company." We refer to our advertising columns this week for full particulars concerning the scheme. It will be seen that glowing descriptions are given by the advertisers of the desirability of certain lands which are represented to be in the city of Denver. The truth of the matter as it comes in the dispatches is as follows: "The scheme was planned in Cincinnati. Stereotype plates were prepared, and have already been inserted in over 800 first-class newspapers and periodicals in the Northern, Eastern and Middle States. Grant came to Denver to secure land for the purpose, and bought nearly a thousand acres in the sand-hills, 40 miles north of Denver, in another county, which was platted and recorded as North Denver. Although known here but eight days, a perfect avalanche of mail was coming for S. A. Grant and the Denver Land Company. The fraud was denounced by the local newspapers, and hitterly condemned by the citizens. The postmaster reported to the Department, and last night received orders to deliver no registered letters and pay no money-orders to Grant. The arrest was made by Special Agent H. Hall. Special Agent Furay is also here, and asks the Department to order the withholding of ordinary letters."

The movers of this swindle were promptly arrested by the Government officers, and being without bail, they were jailed for trial. The result of the swindle affords a good illustration of the "biter bitten."

The official vote of Pennsylvania for State Treasurer is as follows: Republican, 280,153; Democrat, 221,815; Greenback, 27,207; Prohibition, 3,219.

All the hostile Ute chiefs are gathered at the Los Pinos Agency, except Jack, who positively refuses to come in and confer with the Commission.

A formidable revolution is in progress at Ohibuahua, Mexico, and new difficulties have arisen in Yucatan.

The Black Sand Bonanza.

The fact that Prof. Edison has an agent in the mining region of this coast, looking into the waste of gold in the present mode of hydraulic mining, seems to justify the statements going the round of our exchanges, that the Professor has discovered a method of saving the gold thus thrown away, at the same time and in the same manner that he proposed to save the platinum. He went still further and authorized McLaughlin (Edison's agent) to make contracts with the principal mining companies with a view of building the necessary works at this city for putting his plan in operation. This is what Major McLaughlin says is desired by Edison at the hands of our miners, and what he proposes to render in return. He desires the latter to make contracts giving him the exclusive right to put in at his own expense a system of undercurrents and end flumes (in addition to whatever flumes and undercurrents they may see fit to use) by which to save the black sand and whatever platinum it may contain. In return for this privilege, he will guarantee to give the miners one-half the gold product of the black sand, free of expense to them. He does not desire to save anything that the miners themselves can save.

The Oroville *Mercury* says: "A fairer proposition than this we cannot conceive of. Heretofore the miners have realized nothing from either the black sand or platinum, but should this offer be accepted, and we have no doubt but it will, the yield of their claims will henceforth be increased from 50% to 100%, according to the quality of the sand. As Edison is the only person knowing how to save the valuable metal now going to waste, he is the only one who can offer such generous terms without sacrificing his own resources—and it is reasonable to suppose that he knows what he is about. The reduction works will cost something like $50,000, and furnish employment to 50 men. They will be in operation, providing the necessary contracts can be made, by the middle of February or first of March. While the works will prove a great value to this community especially, the discovery is destined to work a revolution in the mining industry of the State, and will eventually cause an era of prosperity in comparison to which the days of '49 will appear insignificant and unworthy of notice. In conclusion we would urge upon our miners the advisability of availing themselves of Mr. Edison's proffers at an early day, as there will undoubtedly be an avalanche of applications as soon as the fact becomes noised abroad."

Continental Pacific Railroad.

We acknowledge the receipt of a pamphlet entitled *La Grandiosa Obra de todos los Siglos, El Ferrocarril Universel*, and also a copy of *El Commercio Periodico Mercantil*, both of which are devoted to a *Gran Proyecto Americano*—"a Continental Pacific railroad," which is to have its termini at San Francisco and Montevideo, crossing all the Central and South American republics. It is to be 6,000 miles long, and will cost the small sum of 325,880,000 "strong" dollars (*pesos fuertes*). The freight and passenger tariff has already been established. A branch line is to be built to Behring's straits, in order to explore the North Pole, thence passengers will be carried over a 13-mile bridge into Asia to Pekin, Persia and across the Sahara desert. The object of this "grand continental railroad" is to enable the population of the earth to travel about and civilize the barbarous portions of the community, as also to solve many scientific and mechanical problems. A board of directors is to be established in every country through which the line passes, all, however, subject to the *Directorio General*, who is to locate in San Francisco. Any person can become a Directorio General for 25 shares of the stock, while a common to ordinary Directorio can get the position for 15 shares of stock. The stock is fixed at $500 per share, a moderate amount when the enormous advantages of this railway are considered. Although the time-table has been arranged, and the freight and passenger tariff fixed at extremely low rates, tickets will not be issued nor freight received until the road is built. The sum of $325,880,000 being the only drawback to the speedy completion of the road, the railroad from Chicago to Patagonia must now take a back seat. The pamphlet before alluded to, which by the way is written by a gentleman entitled Juan B. Bobbio, says that the nine wonders of the world are a bagatelle to this railroad, which will likewise afford a profound and illustrated study, meditation and observation for the mathematician, politician and financier. We believe it, and if it is going to remove all the miseries of humanity, as Mr. Bobbio says, we are in favor of it provided we can be the *Directorio General*.

The General Committee of Church Extension of the Methodist Church are holding their annual meeting at Philadephia.

Fernando C. Beaman has been appointed by the Governor of Michigan United States Senator, vice Chandler, deceased.

The Supreme Court and Mining Debris.

A Decision in Favor of the Miners.

On the 17th inst. the Supreme Court of California sustained the objections made to the complaint by the defendants in the case of Keyes vs. Little York Gold Washing Co., because of misjoinder of parties, and that the judgment and order were accordingly reversed, and the court below would be directed to sustain the demurrer. As indicating the ruling to be final and irrevocable, it was added that the remittitur would issue forthwith. This dissolves the injunction against the miners, throws the case out of court, and, so far as the present suit is concerned, ends it.

The opinion of the court is substantially as follows: "The complaint sets forth that the plaintiff is the owner of certain described premises known as the bottom lands, situate in the valley upon the banks of Bear river, about ten miles from where that stream debouches into the Sacramento valley, and midway between that point and the mouth of the river; that the defendants are miners severally engaged in hydraulic mining at points high up on Bear river and its tributaries—the several mining properties of the defendants lying within a radius of seven miles upon the hill tops adjacent to the river, and being severally wrought and carried on by the respective defendants, and that the several dumps used by the defendants respectively in their mining pursuits are some of them in the bed of the river, others in the beds of its tributaries, and yet others in the beds of steep ravines and gulches, immediately contiguous to and leading into the bed of the river or its tributaries; that the tailings of the several mining claims deposited on these dumps are swept down the river by the force of the current until they reach the lands of the plaintiff below, upon which they are deposited, and which they cover so as to destroy the value of said lands. The prayer is that an injunction issue enjoining the defendants from depositing the tailings and debris of their several mining claims so that they reach the channels of the river, etc.

"The defendants appeared to the action and filed a demurrer to the complaint upon several grounds—and among the others upon the ground that there is a misjoinder of parties defendant, in that it did not appear by the complaint that the defendants jointly committed any of the acts complained of, or are acting therein in concert or by collusion with each other, but that, on the contrary, it did appear by the complaint that the defendants had no interests in common in the subject-matter of the suit, but were acting severally, and without any joinder or co-operation on the part of the defendants, or any of them. The demurrer was overruled by the court below, and the propriety of its action in that respect is brought in question by this appeal.

"An injunction is granted when the relief sought consists, wholly or in part, of restraining the commission or continuance of acts being done or threatened, or when the commission or continuance of acts during litigation, will produce irreparable injury or render a judgment in plaintiff's favor ineffectual. (Code of Civil Procedure, Section 526.) The injunction ordered at the final hearing by the court below was not ancillary to any other provision of the decree, or added to render some other final order more effective. It was the only decree sought by plaintiff, and is the very most that the allegations of his bill would have entitled him to, had the defendents been charged with co-operation, and a common design in doing that which each threatened. There are indeed recitals in the complaint alleging plaintiff to have already sustained damages, but no relief is sought upon them as allegations constituting the basis for a decree. They are rather in the nature of statements of evidence tending to sustain the averment that like damages will occur in the future unless defendants are restrained. In the face of a demurrer for misjoinder (even had damages for past injuries been demanded in this case) no judgment for damages could have been rendered against the defendants jointly, because they are charged each to have committed a tort severally; and several judgments for damages could not have been rendered against each of the defendants in the same action, for such judgments would have demonstrated the misjoinder. No damages are claimed in the prayer for judgment or in the points of counsel.

"The wrong complained of is that each of the defendants, acting for himself and not in collusion or combination with any other, threatens to continue to deposit the tailings from the working of his mine in such position, on or adjacent to his own premises, as that, from natural causes, they will flow down or be forced down upon the plaintiff's farm.

"If a nuisance was created by the exposure of the dumps to the action of the waters of Bear river and its tributaries, a nuisance was committed by each of defendants when he—disconnected from the others—made or threatened such deposit; or, if it be said that the matter of the reasonable use of the stream can enter into the inquiry, there could be no nuisance by any of the defendants who had made only a reasonable use.

"In either view of the case there is a misjoinder of parties defendant. The bare statement would seem to prove the proposition, since the very essence of the objection of misjoinder of a defendant with others is that he is not connected with or affected by the single cause of action, if there is but one, or that he is not connected with or affected by one or more of several separate and distinct causes of action, if several are alleged. If any one of these defendants was liable to be enjoined he could have been enjoined in a separate suit, the subject-matter of such suit being the alleged threatened wrong. If any one of the defendants is not liable to be enjoined in a separate suit he cannot be made liable in an action like the present; for there is no principle of equity which would make a man responsible for a wrong which he has neither done nor threatened, merely by joining him with other defendants who may independently have threatened a similar wrong."

In most of the cases cited in support of the complaint and against the objections urged in the demurrer, the main point was either that the plaintiff had an exclusive right against which the defendants were asserting adverse rights, as in the case of an infringement of patent, or that there was a privity between the defendants, a combination, as it were, which does not exist in the present case so far as the allegations in the complaint are concerned.

The court regarded the rule at law where an action for a tort is brought against several co-defendants, it is essential that the wrong complained of be joint, as well understood and undisputed, and remarked if there are any exceptions in equity they have not been called to its attention. "We are convinced that none can be found which will authorize the joinder of defendants attempted in the proceeding before us."

We are moved to remark that while the merits of the case have not been passed upon as desired by the plaintiffs, yet the decision was not upon a mere technicality. The "misjoinder of parties" has more to do with the merits than would be supposed at first blush, since it appears to affect the right of the plaintiff to bring any action. The proceeding was an attack upon the whole body of miners, and an attempt to stop their further deposition of debris at one and the same stroke. This, the court says, cannot be done. Perhaps it is a very fortunate thing that it does so hold, and here we argue for the farmer as well as for the miner, for once admit that an entire community must depend upon the good or ill nature of a single individual, and a doctrine of absolutism is established to destroy which was the mainspring of the War of the Revolution.

In our judgment an amicable settlement would accomplish better results than law suits.

The hydraulic miners have not assumed an aggressive position, but have simply defended what they claim as their rights. They bought their lands at the double price of $2.50 per acre from the United States Government, and the act of 1866 gave them certain rights of way for canals and ditches, which act was subsequently codified in the United States laws. The farmers in the suit just decided, commenced action against a number at once, not for damages, but to restrain them perpetually from depositing the tailings and debris of their several claims in the channels, and for suffering the tailings from flowing into the rivers and fouling and polluting them. If this view had held, the miners would have had to shut down entirely. Under the decision cited above, separate actions against each miner may be commenced, but the *direct* damage must be proven—that the one sued committed the nuisance. The miners have always paid, without suits, damages resulting from dumping their tailings directly on to another's land, and have bought thousands of acres for dumps.

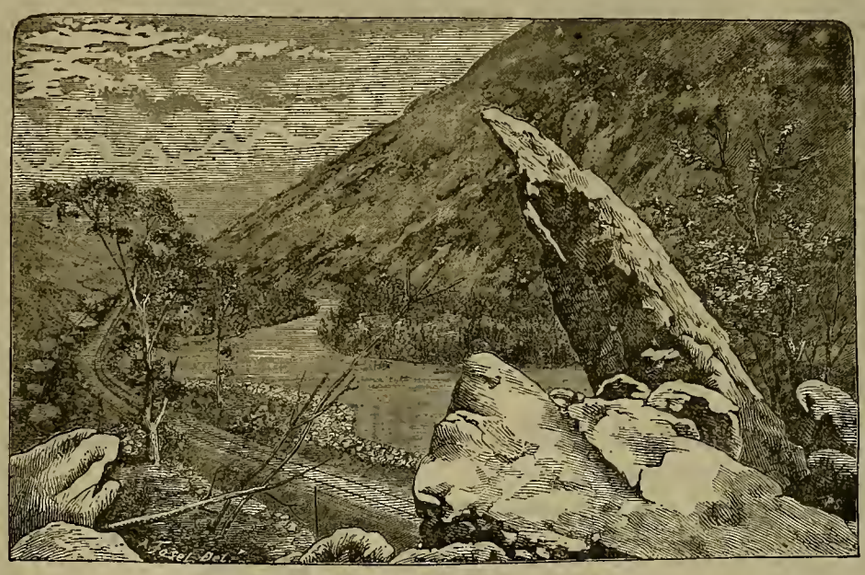
The decision has also had the effect of ending the proceedings instituted by the city of Marysville against the hydraulic miners of Sierra, Plumas and Nevada counties to enjoin them from further sending debris into the Yuba and Feather rivers and their tributaries.

The Mount Jefferson Mine.

We learn from a gentleman just arrived from Tuolumne county that the chlorination works at the Mount Jefferson mine have been rebuilt and are once more in successful operation. These works were permitted to fall into disuse and decay some years ago, when for lack of pumping facilities the mine filled with water and work on it ceased. Latterly, however, the company has been reorganized and new pumping machinery erected. After some time spent in trying to make the mine pay on the free gold in the ore, the managers concluded very wisely to repair these works and continue operations on the old plan of concentration and chlorination, so successfully followed in the palmy days.

The roasting furnace here, which is the principal feature for reduction by this process, has three hearths or compartments, in steps about two feet high and connected by openings through which the heat passes successively from the fireplace. The upper or back chamber most distant from the fire is of course the coolest. Into this the raw charge is introduced, where it remains for some eight hours, when it is passed to the next compartment and so on through the series, the mass being kept in motion throughout the process by means of stirring with iron hoes. By this means about 1½ tons of sulphurets per day are completely desulphurized. After thorough roasting the pulp is placed in large vats where it is treated with chlorine gas generated by means of salt and sulphuric acid. The gold is thus converted into a chloride, which being soluble in water is leached off into another vessel where it is precipitated with sulphide of iron and collected by decanting or filtration.

The ores from this mine contain a very large proportion of sulphurets of iron, some deposits carrying as much as 15%. These sulphurets, when perfectly clean or free from gangue matter, are worth by fire assay about $100 per ton; but in roasting for chlorinating it is found much better to have them mixed with a proportion of sand. This has a tendency to prevent matting, and gives the sulphur a better chance to pass off, so that in practical working it is aimed to have them carry about 30% or more of quartz, thus reducing them to about $60 per ton. Of this gross value about 90% can be saved by the process above described, and as the ore contains on an average about 8% of these sulphurets, a great saving is effected. The amount of ore here reduced is sufficient to keep the chlorination works supplied with sulphurets. Heretofore these have mostly found their way down the creek. It costs by this process about $12 to extract the gold from a ton of sulphurets, and allowing the liberal sum of $4 for concentration, the company will be able to save at least $40 per day.



FINGER ROCK, ECHO CANYON, UTAH.

Finger Rock.—Echo canyon, in Utah, contains many remarkable features in the way of rock formation, caused by erosion or the wearing away of the soft soil, leaving hard rocks prominent. These assume fantastic shapes, which have been named according to the resemblance which they are supposed to bear to the object from which they are named. Hence Finger Rock, as in our illustration, Pulpit Rock, Devil's Slide, and numerous others.

Result of Economy in Mining.

The Ferguson mine, in Mariposa county, continues to open out in a way that must be very gratifying to the owners, and fully justifies the patient and business-like method of working to which they have steadily adhered. Instead of rushing after each ton of ore as soon as it could be got out, no matter how disadvantageously, and therefore expensively, their first attention has been given to opening out fairly the large bodies of ore standing in the mine, putting the bulk of the proceeds back into the mine in pushing forward the developments, and contenting themselves meanwhile with a moderate margin over running expenses. The result is that they now have one of the best developed mines—perhaps the best, not excepting the adjoining Hite mine—in the county, with reserves of good pay ore enough for years of very profitable working.

In the main tunnel, which has been drifted on the fissure for 1,500 feet right into the mountain, three distinct bodies of valuable ore have been developed. Two shafts have been sunk on these chutes, one 170 feet and the other 200 feet deep, and from the bottom of the latter a level has been run north and south over 600 feet, the whole distance on good milling ore from one to three feet thick, though at one or two points it becomes narrower, and for a short distance is hardly wide enough to extract profitably. At the south end of this level the vein is three feet wide, and the north end two feet; the extent of the ore body in each direction has yet to be proved. Below this bottom level a winze has been sunk nearly 40 feet deep. In it the vein averages over two feet wide, and it showsg old freely. Some exceedingly rich rock has been found in the mine, but the average ore yields from $12 to $30 per ton in the mill. The whole cost of mining and milling does not exceed $7 per ton, as the facilities for economical working are exceptionally good. The Merced river gives a constant and practically unlimited power, free of all cost; and when the milling power is increased, as it will shortly have to be, the cost per ton will be still further reduced. The lowest point in the mine is over 700 feet below where the vein was first discovered and worked, and the present indications justify the expectation that the vein may be found to extend 700 feet further, or indeed to an indefinite depth.

If the same care, pluck and patience were exercised by parties engaged in mining on this coast, as the owners of the Ferguson mine have displayed, equally good results would, in many cases, be obtained; and though all mines cannot be expected to open up such extensive bodies of pay ore, there are series of mines, now idle or running unprofitably, that could be made to yield very satisfactory returns to their owners. There are few enterprises that offer so good a field for the safe and profitable investment of capital as does gold mining in California, if only it be prosecuted with the same prudence, vigor and economy as are essential in any other kind of business.

Borax Works.—On the line between Inyo and Kern counties, California, is located Borax lake. The works of Searles & Co. are located here, and are turning out regularly, says the *Independent*, fifty tons of refined borax per month, being an average of just one ton each for the men employed, all told. The works are doubtless the most perfect in plan, appointments, extent and condition of any in the world, and have at hand the most extensive and inexhaustible supply of the crude material from which the merchantable borax is manufactured. The works have an actual capacity of 600 tons per month, but owing to the present limited demands of the world's market, are run to but one-sixth of their capacity, as above stated. The locality, its surroundings, products, modes, capabilities, geological, minerological, chemical and, last but not least, its agricultural peculiarities together constitute this the most interesting field for the merely curious as well as the scientific to be found in this whole country.

Navigation on the canals in New York will be closed Dec. 6th.

Caution!

In the absence of the Senior proprietor, the advertisement on page 330 of this issue was inserted. Telegrams from Denver assure us that we have been imposed upon, that the scheme is an unmitigated fraud, and all readers are hereby cautioned against patronizing the Denver Land Company.

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Testing and Working Silver Ores.

The above is the title of an illustrated work of 114 pages, for miners and prospectors, by Chas. H. Aaron, which has been issued by Dewey & Co. Mr. Aaron has managed to give many useful hints and suggestions, free from all technicalities, and in such a style as to be easily comprehended. It is written for the miner, with no chemical symbols or metallurgical technicalities to confuse those who are not chemists or metallurgists. The following summary of the contents of the work will give an idea of its scope:

Under the heading of the first chapter, "Testing Ores for Silver," we find paragraphs on ore formation test for silver, with heat and water, acid or blow pipe. In speaking of testing for a process, the extent and richness of ore is considered, smelting ores, selecting and working sample, appliances for testing, roasting, etc. Under the head of "Working Ores" the author describes Aaron's process, has something to say of superheated steam, preparation of dichloride of copper and protochloride of copper, use of copper and iron, quantity of chemicals, carbonate of lime, chloride ores, amalgam, Patchen's process, etc. He also describes the methods of working roasted ores, treatment of base metals, stirring, heat of furnace, want of sulphur, etc. Under the head of "Leaching Processes" are the titles, Smelting, Mexican process, Chilean process, Kroehnke's process, etc. Under "Pulverizing Machines" are described the arastra and its construction and operation, stamp batteries, screens, Crocker's trip-hammer battery, Paul's pulverizing barrel, Kendall's battery, Noice's pulverizer, a cheap rock breaker, etc.

In speaking of amalgamators the author describes a cheap amalgamator, grinding the ore, directions for making a barrel, preventing mechanical wear, use of quicksilver, copper in bars, Freiberg barrel, cheap barrel trough, barrel on rollers, Aaron's amalgamator, separator, etc.

He describes an improvised retort, roasting furnace, furnace tools and furnace building. Among the miscellaneous mention may be found Aaron's leaching apparatus, with two or three different arrangements, a small mill, sampling tailings and settling tanks, dichloride of copper, etc. Mr. Aaron is a practical miner, of long working experience on this coast.

The book is a serviceable one for miners' and prospectors' use. Price, post free, $2.00. Address Dewey & Co., MINING AND SCIENTIFIC PRESS, 202 Sansome Street, San Francisco.

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[SEAL.] State of Colorado, } County of Weld. } ss.

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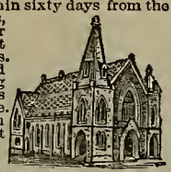
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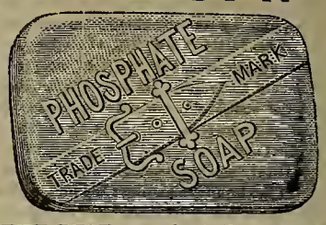

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No salve or ointment can heal a wound or sore of any kind. Every educated physician will tell you that nature alone can do this. PHOSPHATE SOAP, by its cleansing, soothing and purifying qualities, gives nature a chance to act freely.

Natural beauty surpasses anything which can be imparted by artificial means. PHOSPHATE SOAP gives health to the skin simply by removing impurities and eradicating the poisons which give rise to skin diseases.

Not only for daily use on the face and hands, but for bathing the entire body, there is nothing equal to PHOSPHATE SOAP. It is a thorough disinfectant and removes offensive odors of every kind.

Ladies who have injured the skin by the constant use of cosmetics may do much to restore their faces to that beauty which nature alone can give by constantly using PHOSPHATE SOAP.

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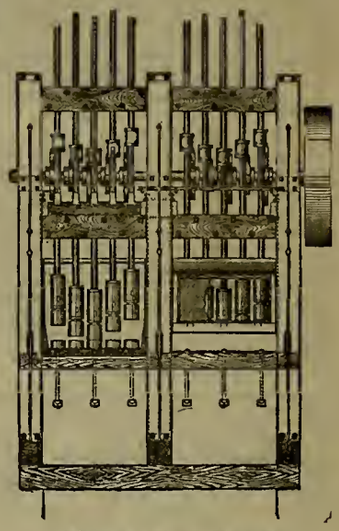

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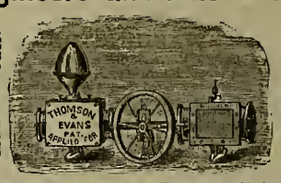

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CONTINUED FROM PAGE 325.

IDAHO.

YANKEE FORK.—*Herald*, Nov. 8: Judge W. F. Anderson handed us a rich piece of very fine smelting ore from the Uncle Ben mine, Bay Horse district. The vein was discovered near the surface, at which point it was only one inch wide, but at the depth of 30 ft opened out to a three-ft vein. The average across the ledge is $92.75 per ton. A strike of very rich rock was made a few days since on the Charles Wain lode, summit of Mount Estes. J. O. Morrison, a short time since, found what promises to be a valuable quartz lode in his placer mine above the mouth of Jordan creek. This is satisfactory evidence that the quartz ledges on Norton hill extend across the Jordan to Bonanza bluff.

EBENEZER AND YELLOW JACKET MINES.—Idaho City *World*, Nov. 11: Hon. James H. Hawley, who returned from a trip to Canyon creek and Quartzburg, a few days ago, informs us that a large body of good ore has been struck in the Ebenezer mine, on Canyon creek. The ledge is from three to seven ft wide, but nothing is yet known of the extent of the ore body. Men have been put to work to develop it, and in a few weeks the company will know what they have. Men are kept at work on the Yellow Jacket, near Quartzburg, and good ore is being extracted.

MONTANA.

BALD BUTTE MINE.—The Helena *Independent* of recent date says: For some days past the workmen have been driving a tunnel through what miners call a "fault," or ore which does not carry any considerable quantity of gold. A small vein of rich ore was always visible in the face of the tunnel, and, like the star in the east, steadily glimmered before the view of the miners and encouraged them to drive steadily ahead. And now it seems as if they will be well rewarded. Mr. Gilmore writes his partners, Messrs. Chumasero, Chadwick and Tatem, that they have pierced through the "fault" and have three ft of quartz, through all of which gold can be seen. So easy is the quartz worked now that the miners pushed the tunnel 10 ft in two days' work. Yesterday the quartz was widening out on both sides of the tunnel, and one blast threw out over four tons of ore.

NEW MEXICO.

COONEY DISTRICT.—*Herald*, Nov. 8: N. J. Cooper arrived from Cooney district, Mogollon mountains, last Saturday night. He reports that mining is being pushed in that district, with the best of results. The Cooney mine, owned by Mr. Cooney and John A. Miller, of Fort Bayard, is the best developed in the district. It shows free-milling ore, the average assay, at the depth of 180 ft, being 230 ounces to the ton. Frank Vingo has a splendid body of ore on the Lady Godiva. It is between well-defined granite walls, and upon the surface measures two and one-half ft in width. Vingo & Cooper are driving a tunnel upon their Ocean Wave claim, and are now working in what they believe to be sulphate of silver. Upon roasting, the ore shows bubbles of pure silver. There are some 15 mines in the district, and from 40 to 50 miners are at work. Wood and water are abundant in the vicinity of the mines, and the timber extends for many miles upon either side. New houses are going up, all built in a substantial manner.

OREGON.

ELLIOTT CREEK.—*Sentinel*, Nov. 12: Miners on this stream are reported doing well. Pickle, Smith & Co. last week struck very rich prospects. In running a cut they came upon an old channel where the gravel averaged 50 cents to the pan. Other miners on the creek are generally doing well. Eaton & Miller's claim is paying well.

JOSEPHINE CO. ITEMS.—Letter from Waldo to the *Sentinel* reports that mining operations are assuming a lively appearance. Preparations are being made for a long run. Prospecting has been the rage during this fine weather, and the mines that have lain dormant for years will be opened this winter. W. H. M. Co.'s hydraulic claim, containing 220 acres mining ground, conducted by Wimer & Simmons, will be ready for piping in about three weeks. This mine has been considered by old experienced miners to be one of the richest mines in southern Oregon. Two years have been consumed in constructing a cut, one-fourth of a mile in length, 60-ft bank. Large flumes have been placed in this cut for a tail race. They have a ditch four miles in length, carrying 1,500 inches, taking their water out of the East Fork of the Illinois river and dumping it into the West Fork. New flumes have been constructed wherever required throughout the entire distance. This winter they will have 140 ft pressure; 900 ft of iron pipe will be used with an 11-inch giant and 4-inch nozzle. Wessel & Co., Hydraulic mine, are making extensive preparations for a long run. The elevator used in carrying the dirt from their mine to the flume works to perfection. Rich prospects have been found beneath what was supposed to be a bedrock, but what proved to be a boulder formation, with good pay dirt.

WASHINGTON.

SKAGIT PLACER MINES.—Mitchell Thibert, an old and experienced miner, returned to Seattle a short time ago, from the newly-discovered Skagit gold mines. He states that his party was engaged six days in poling up Skagit river from Mount Vernon, the head of canoe navigation, and from thence was two and a half days making the trip overland to the diggings, packing from 75 to 100 pounds to the man, over a very difficult foot-trail, though not so bad as has been represented. At the time he left but little work was being done, claim holders generally waiting for the water to go down. On Butcher claim a wing-dam was being constructed for the purpose of draining the bed of the creek. The Boren claim has been worked down to the bedrock and found to be rich. Mr. Thibert prospected eight pans of top-gravel, from which he obtained 33 cents. This, he states, is much richer than any top-gravel found in Cassair. He also prospected five pans on the riverrock, from which he obtained 10 cents. Other parties are making $5 per day panning top-gravel. Most of the claims will be very hard to open, the bedrock in many places being 12 to 20 ft below the surface. Claims are being located very fast. On claims already open work will be continued until December 1st, or later. As a general thing, however, operations will be suspended until spring. On the night of the 1st inst. ice formed to the thickness of three inches in the mines.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Hillside, Nov. 14th, $3,500; Northern Belle, Nov. 10th, $5,018.73; Bodie Con., Nov. 17th, $30,000; Northern Belle, Nov. 12th, $8,954.78; Hillside, Nov. 16th, $3,500; Gila, Nov. 15th, $3,061; California, Nov. 11th, $13,569.55; Con. Virginia, Nov. 11th, $54,715.74; Northern Belle, Nov. 15th, $7,327.60; Hillside, Nov. 20th, $3,000.

IN New York Government bonds are quoted at 103 for 4s of 1907; 102¼ for 5s of 1881; 106½ for 4½; sterling, $4.81@4.84; silver bars, 115½; silver coin, ⅜@⅞ discount.

THE future Queen of Spain, Archduchess Marie Christine, has officially renounced her right to the Austrian succession.

Decisions in Patent Cases, Etc.

U. S. Circuit Court, Northern District of Illinois.

Irwin et al. vs. McRoberts et al.

Decided July 8th, 1879. Motion for preliminary injunction. Blodgett, J.:

1. On an application for preliminary injunction, a re-issued patent containing claims not in the original patent, and alleged to be infringed by the defendant, is to be treated as a new patent, so far as their standing as to acquiesence and acceptance by the public is concerned.

2. That the device patented has never been put on the market as an operative article for sale, nor the patent passed the ordeal of litigation, nor its validity accepted by the public, are circumstances to be taken into consideration in determining the right of a party to a preliminary injunction.

Injunction refused, on condition that the defendant shall enter into a bond in the penal sum of $10,000 for the payment of any damages that the complainants may recover.

Cooke et al. vs. the New York Central and Hudson River Railroad Company.

Northern District of New York. Decided July 6th, 1879. Blatchford, J.:

Re-issued letters patent No. 7,690, granted to C. L. Cooke May 22d, 1877, for an improvement in railway switches, for which original letters patent No. 121,158 were granted Nov. 21st, 1871, cover a patentable improvement.

There must be a decree for the plaintiffs for a perpetual injunction, and, under the stipulation of the parties, a decree for the plaintiffs for $3,750, damages for past infringements and for costs.

Barker vs. Stowe. Same vs. Newhall.

U. S. Circuit Court, Northern District of New York.

Decided September 2d, 1879.

1. Under Equity Rule 88 an application for rehearing in a patent case cannot be entertained unless made within the term at which the final decree was entered and recorded, such cases being appealable to the Supreme Court.

2. An affidavit in support of a motion for a rehearing is not sufficient if it merely states that the party "made every effort to obtain the testimony (rebutting), but was not aware that he could do so," without stating what efforts were made, or that he visited any of the places mentioned or saw any of the persons named in the testimony sought to be rebutted.

3. If the plaintiff is surprised at the testimony of one of his witnesses, he may ask time to investigate in regard to it, on the ground that no notice of it had been set up in the answer.

The motions are denied.

Blake et al. vs. Boisselier et al.

Eastern District of Missouri. Decided March term, 1879. Treat, J.:

A provisional injunction may not be obtained *simpliciter* without giving bond or security when a party has only some vague and indistinct right, and the order may result in injury to the business of the defendant, which is not necessary for the maintenance of the complainants demand, and may be ruinous to the defendants.

To preserve the status of the parties until a final hearing, without injury resulting, the order will be simply that the defendants keep an account of the articles manufactured by them and also of those by them sold.

The Odorless Excavating Apparatus Company vs. Clements.

District of Maryland. Bond, J.:

1. A decision in a previous suit in the same court between other parties determining the validity of the same reissue and the identity of the defendant's apparatus will not be disturbed without cogent reasons.

2. An apparatus for cleaning privy-vaults which draws the matter directly into the receiving vessel by a vacuum created therein by an air-pump, differs in principle from an apparatus which first draws the matter into a pump and then forces it out of the pump into a receiving vessel.

3. An apparatus for cleaning privy-vaults which draws the matter directly into a cask which is portable and conveniently handled, is not anticipated by earlier inventions, operating upon the same principle, where the receiving vessel is a large tank mounted on wheels, or in which the receiving vessel is permanently secured to a framework.

4. It involves invention to place a float-valve at the mouth of an air eduction pipe in a night-soil cask so as to close such pipe and stop the operation of the air-pump when the cask is filled, although similar valves were old and had been used in steam boilers and water tanks to close eduction passages.

5. The validity of reissue No. 6,962, dated February 29th, 1876, to Lewis R. Keizer, assigoee, reaffirmed.

The fact of infringement is admitted if the complainant's patent is sustained, and a decree will be passed in accordance with this opinion, and the cause referred to a master to ascertain the damages.

Ex-parte Hoffman.

Decided Aug. 26th, 1879. Motion for rehearing. Paine, Commissioner:

A motion for a rehearing cannot be entertained after the case adjudicated has been amended by the removal of one or more of the claims. The only recourse of the applicant is to a new interlocutory appeal upon a refusal by the Examiner to consider the merits of the claims in their amended form.

Brushes—Ex-parte Dinkelhihler.

Decided August 26th, 1879. Interlocutory appeal from the Primary Examiner.

A claim for a rotary brush, with handles at right angles to each other connected by a frame, cannot be joined with a claim for a rotary brush with handles at the opposite ends of its axis, for the two sets of handles do not co-operate with each other, nor are they used either simultaneously or successively in the accomplishment of any result.

The decision of the Primary Examiner is affirmed.

Report of the United States Land Office.

The telegraph brings from Washington a digest of the annual report of the General Land Office. The following shows the disposal of public lands in California, during the last fiscal year:

Taken for homesteads, 223,014 acres; purchased for cash under pre-emption entries, 114,228 acres; timber culture entries perfected, 15,619 acres; taken under the Desert Land Law, 24,067 acres; cash receipts from all sources, $276,505; incidental expenses, $48,342. Only about 5,900 acres were patented to the State of California last year under Federal grants for all purposes, 5,273 acres being the total for indemnity school selections. The total number of desert land entries in the whole country was 530, embracing an aggregate of 165,996 acres, or only about half the totals of the preceding year.

The desert land entries in Nevada aggregated about 28,000 acres; in Montana, 39,000; in Arizona, 15,000 acres, and in Oregon, 6,000 acres.

The General Land Office report incorporates large portions of a report received from Surveyor-General Wagner. It shows that only about $30,000 was allotted for the survey of California agricultural lands, $10,000 for timber land, and $4,000 for private land claims, and about $32,000 was advanced by settlers and railroad companies for surveys. Total number of acres of public lands in California surveyed during the last fiscal year was 1,910,531 acres, leaving about 41,000,000 acres still unsurveyed. Surveyor-General Wagner says that nearly all the lands in California now unsurveyed should be sectionized, without restrictions as to their character, and recommends the removal of all restrictions. He says grazing and other lands are so intermingled that it is practically impossible to properly draw a line of demarcation; and consequently small tracts of valuable land must be left unsurveyed. The restrictions have not resulted economically to the Government, as the surveys frequently necessitated by this patch-work system cost more than the saving, besides giving rise to much litigation on account of changes in the topography. He says it is imperatively necessary to complete the survey of standard and meridian lines and township exteriors at the earliest possible date, in order to avoid in the future the serious errors resulting from the present piece-meal system of subdivision into sections. They may then proceed as settlements demand and Congress makes appropriations. Wagner makes a strong argument for liberal appropriations, and shows that the policy of Congress in making such limited provision for surveys in California has operated injuriously to the best interests of the State and also of the National Treasury. He calls attention to the fact that the occupants of unsurveyed lands are unable to acquire title, and although the State has passed laws for the protection of these actual settlers, it also protects speculators in holding large tracts, without cost or taxation, which would be impossible if the lands were surveyed and subject to entry. In that event these tracts would furnish homes for a large number of families by simply fencing, using and occupying them. He reinforces his plea for increased appropriations by showing that much land in California, formerly considered worthless, is now discovered to be very valuable. He instances the San Joaquin valley lands, and also quotes articles from the San Francisco *Bulletin*, showing that public attention is being directed toward a neglected belt of land between the foothills and snow lines of the Sierra Nevada mountains, where there are thousands of acres sufficiently level for farming purposes. He also gives statistics showing the rapid development of California wine-producing interests. He remarks that even the scant products of the Mohave desert are now being utilized by the manufacture of paper from a species of cactus; but as this is too widely scattered to justify the purchase of land from the Government, and as the industry, although giving promise to become valuable to California manufacturing interests under favorable conditions, requires an outlay of considerable capital for machinery, he recommends that Congress be required to authorize these lands to be leased to any party desiring them for a term of years, the lands, however, to remain subject to entry under the homestead or pre-emption laws.

Gen. Wagner also argues that all money which may be appropriated by Congress for surveys in California would in a few months be returned to the Treasury by sales of land. Thus, for instance, the total amount expended last year in the survey, sale and disposition of public land in California was $103,747, and during the same period the sales yielded to the Treasury $456,773. He also shows the necessity for liberal appropriations to bring up the long accumulated arrears of office work, and asks $20,000 for that purpose, besides $135,000 for ordinary land surveys, $50,000 for timber lands, and $10,000 for the survey of private land claims. Gen. Wagner recommends that the law authorizing homestead and pre-emption surveys to be made upon deposits of estimated cost, be extended to agricultural lands in mineral districts, and also to desert lands and timber lands. He says very little of the timber land in California has been surveyed, and as enormous quantities of timber are used in the neighborhood of mines, and as there are no adequate means of protecting unsurveyed lands, they are rapidly being despoiled. He therefore requests that the timber lands should be surveyed so that persons entitled to enter them under the law of 1878 may obtain title. He adds: "There is no danger that non-resident speculators would monopolize the timber lands under this law, for, aside from its safeguards, they would be no better able to protect the lands from speculation than the Government."

The Surveyor-General says in regard to mineral lands, that the rectangular system is so readily understood by all classes that it cannot be supplemented by any so-called scientific system; that the contract system of survey is better than the proposed system of salaried deputies; that the classification now made by Deputy Surveyors is as accurate as can be made at moderate cost, and that the whole matter should be left undisturbed. The total number of mines surveyed thus far in California is nearly 2,000.

News in Brief.

ALEKO PASHA has arrived at Constantinople.

GREAT preparations are making in Spain for the King's marriage.

THIRTEEN person were drowned Sunday at Islay, Scotland.

THE Vatican is to issue a new daily newspaper—the *Aurora*.

ABDUL-KADIR, the famous Algerian chief, is dead, aged 72 years.

GENERAL CIALDINI, Italian Minister to France, has resigned.

BULLION in the Bank of England decreased £886,000 the past week.

W. F. WILCOX, an old citizen, died at Portland, Or., Sunday evening.

THE Sultan has ordered the re-equipment of the forts on the Dardanelles.

HEAVY gales on the English coast have caused much damage to shipping.

THE wife of Baron Manteuffel, Governor of Alsace-Lorraine, is dead.

PRESIDENT HAYES formally opened the Grand Fair at New York Nov. 17th.

A WOMAN and her two daughters were drowned Saturday near Columbus, Ind.

ONE of the Kahns and his brother are inciting an insurrection in Kohistan.

MEMORIAL services in honor of the late General Hooker took place at Boston.

THE shore end of the new French cable has been landed at North Eastham, Mass.

THE Czarowitch and Czarina and King and Queen of Denmark have arrived in Vienna.

THE war in New York against dealers in lottery tickets is being vigorously prosecuted.

A DROUTH of alarming proportions prevails in the section of country around Petersburg, Va.

S. M. OAKES was shot and killed at Reno, Nev., Sunday night by Mrs. Dr. T. N. Snow.

THE inquiry into the Ameer's connection with the Cabul massacre has been commenced.

AN explosion of fire damp in a colliery near Wolverhampton, Eng., caused the death of six men.

IT is reported from Paris that two French explorers have discovered the source of the river Nile.

SILVER in London is quoted at 53⅝d; consols, 97 15-16; 5% U. S. bonds, 103½; 4s, 106⅝; 4½s, 108¾.

A SHIPMENT of flour was made from New York Saturday, destined for Queen Victoria's kitchen.

FORTY-NINE Afghans have been hanged for complicity in the massacre of the British Embassy.

THE German authorities have prohibited Russian steamboat traffic in the Prussian section of the river Niemen.

ENGLISH farmers and merchants, to the number of 120, some with families, left Liverpool lately for Texas.

REV. J. B. MCNAMARA was installed at New York Sunday as Bishop of the Independent Catholic Church.

IN a railroad accident near Alton, Ill., Saturday, a brakeman was killed and an engineer and fireman injured.

AT Liverpool wheat is quoted at 10s 8d to 11s 6d for average California white, and 11s 5d to 11s 10d for club.

THE withdrawal of the greater part of the Turkish troops on the Greek frontier has been ordered by the Porte.

AUGUST WOEHLER, who attempted to assassinate Dr. E. B. Foote in New York recently, committed suicide.

REV. ALEX. MACKONOCHIE has been suspended from his ecclesiastical functions in England for ritualistic practices.

A SCHOONER foundered Friday near Point au Pelee, Lake Michigan, and the entire crew, with one exception, perished.

PATENTS AND INVENTIONS.

List of U. S. Patents and Trademarks for Pacific Coast Inventors.

[From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING NOVEMBER 4TH, 1879.

221,285.—TAP FOR TIN-CANS, ETC.—J. T. Cooper and J. Wagner, Silver Reef, Utah.

221,220.—VALVE MECHANISM—Geo. E. Dow, S. F.

221,224.—STEAM ENGINE—A. Ehret, S. F.

221,226.—FASTENING WHIP LASHES—J. J. Fowler, Ukiah.

221,305.—WRENCH—W. A. Heath, Headsburg, Cal.

221,325.—CAN FOR HERMETICALLY-SEALED GOODS—C. C. Lane, New Westminster, B. C.

221,178.—EAR-RING—W. A. L. Miller, S. F.

221,346.—ATTACHMENT FOR INVALID BEDS—R. O'Donnell, San Francisco.

221,196.—MECHANICAL CALCULATOR—S. Petty, Volcano, California.

7,766—CHEESE—Trademark—F. Korbel & Bros., S. F.

FOR THE WEEK ENDING NOVEMBER 11TH, 1879.

221,463.—CAN—C. C. Lane, New Westminster, B. C.

221,890.—PISTON FOR HYDRAULIC CYLINDERS—F. A. Bishop, S. F.

221,527.—SPRINKLER FOR RAILWAY RAILS—M. F. Craig, Nevada City, Cal.

221,454.—WEATHER STRIP—James C. Gibson, S. F.

221,457.—REVERSIBLE PLOW—O. Haskins, Cambria, Cal.

221,008.—SKATE—J. E. Parmenter, Fort Pembina, Dak.

221,470—SAW CLAMP—S. Petty, Volcano, Cal.

221,473.—GUIDE FOR STEMS OF STAMP-MILLS—W. Raup, Park City, Utah.

221,021.—GRAIN SEPARATOR—W. H. Silsby, Chico, Cal.

221,432.—IRRIGATING MACHINE—Geo. Uhl, Sacramento.

221,433.—WASTE-PIPE CLEANER—E. J. Verrue, S. F.

221,485.—ELECTRO-THERAPEUTICAL BELT—C. N. West, San Juan South, Cal.

2,116.—Title, "EL MEJOR CAFE MOLIDO DE COSTA RICA PRIMERA CALIDAD"—Label—E. Guittard, S. F.

The following foreign patents have been issued to residents of this Coast:

English Patents

Which have passed the great seal:

757.—IMPROVEMENTS IN MOTORS—E. J. Molera and J. C. Cebrian, S. F. Feb. 25, 1879.

1,057.—PUMPING MACHINERY—E. J. Molera and J. C. Cebrian, S. F. Mar. 18, 1879.

1,102.—CANDLE-STICK—A. J. Smith and E. W. King, Ukiah, Cal. Mar. 19, 1870.

2,250.—SEWING MACHINES FOR SEWING CARPETS, ETC.—J. Hesse, S. F. June 6, 1870.

2,727.—MACHINERY FOR GRINDING OR TURNING HARDENED METAL SURFACES—J. H. Gowan and C. Daniel, Carson, Nev., July 4, 1870.

2,889.—WRENCH—A. Jackson and J. J. Dunn, S. F. July 16, 1879.

2,965.—BREECH-LOADING FIRE-ARMS—A. Swingle, S. F. July 22, 1879.

3,255.—HOOKS—F. Kortick, S. F. Aug. 13, 1879.

Canadian.

10,307.—SYSTEM OF LIGHTING—E. J. Molera and J. C. Cebrian, S. F. July 29, 1879

10,363—VAPOR ENGINE—W. P. and W. T. Wood, Washington, Cal. Aug. 14, 1879.

Victoria.

2,060.—MACHINE FOR PULVERIZING ORES AND AMALGAMATING METALS—A. B. Paul and J. T. Davis, S. F. June 21, 1879.

German.

7,804.—ROCK DRILLING ENGINE—W. W. Dunn, S. F. Sept. 4, 1878.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

CAN FOR HERMETICALLY SEALED GOODS.—Chas. C. Lane, New Westminster, British Columbia. The ordinary form of cans in which salmon and other fish are hermetically sealed, necessitates the cutting of the fish into pieces of small size, and its appearance when prepared for the table is not satisfactory. To obviate this, large, fish-shaped cans have been made by stamping out two pieces of tin, each forming the entire length of the fish. Besides necessitating the use of a large and expensive size of tin, which will cut to waste a great deal, these cans can never be finished until the fish has been placed in them, and a longitudinal seam of double the length of the fish must be soldered by hand, as the mechanical bath cannot be depended upon to make a tight joint without blowholes after such a can has been filled. Besides this, each can must fit its fish closely enough to prevent movement to preserve the fish, and no adjustment being possible, the time taken to select cans to fit fish render this method too slow, costly and impracticable. This invention consists in the formation of a can in two parts, the parts, respectively, being approximately of the shape of the head and tail half of a fish divided transversely to its length, and this two-part can is so fitted that it may be adjusted longitudinally to fit the length of the fish. By this construction, a fish-shaped can may be formed from sheets of metal of ordinary size without undue waste, and by reason of the adjustability of the parts, the halves can be manufactured in quantity and by the aid of the mechanical bath, so as to have the requisite number of cans on hand when the canning season commences, and from the peculiar construction of the can, the amount of soldering to be done when the fish is placed in the can is reduced to a minimum.

TUYERES.—Thomas McCaffery, S. F. Patent 220,766, dated October 21st, 1879. With this invention either one of the various styles of blast openings may be used according to the work on hand. The improvement consists in providing a flat metal plate having perforations of different sizes and shapes, said plate having rack-bars on its lower edges, so that a rack-wheel operated by a crank may move said plate back and forth in a case provided for it enabling the workmen to bring either one of the perforations under the hole in an upper plate through which the air passes from the bellows to the fire.

WINDMILL.—Z. and F. M. Cottle, Oakdale, Stanislaus county, Cal. Patent 220,751, dated Oct. 21st, 1879. This wheel is intended for pumping water in such localities as have prevailing winds from one direction for a length of time. In the great valleys of California the prevailing winds of the summer months are westerly and the windmill is set up so as to face the westward. Occasionally, however, the wind will blow from an opposite direction for a short time and the motion of the wheel would then be reversed. In order, however, not to have the shaft also reverse, a supplemental pinion is placed between the spur-wheel and a large pinion so as to change the motion.

WEATHER STRIP.—James C. Gibson, S. F. Patented Nov. 11th, 1879. No. 221,454. This invention consists in the employment of a peculiar elastic strip, secured to a movable plate in a recess at the bottom of the door, so that when the door is closed the strip is forced down tightly against the sill, so as to prevent the entrance of wind and rain and make a close joint. On the opening of the door the strip is thrown back into the recess or against the bottom of the door by its own elasticity. The peculiar construction of the weather-strip is such that no supplemental hinges are necessary, the substance of which it is composed being elastic, and while it forms a tight joint when the door is closed, it is thrown up out of the way as it opens.

REVERSIBLE PLOW.—Ozro Haskin, Cambria, Cal. Patented Nov. 11th, 1879. No. 221,457. This invention relates to certain improvements in reversible plows in which the land-side and mold-board are alternately changed with reference to the beam, so as to turn the furrow in the same direction, as the plow is drawn back and forth across the field, being especially applicable to hillside plowing. It consists in a right and left mold-board attached to the double reversible land-side hinged to the vertical swiveling axis of the plow beam, and also in a method of holding and locking the plow in position.

HYDRAULIC WASTE PIPE CLEANER.—E. J. Verrue, S. F. Patented Nov. 11th, 1879. No. 221,483. This invention relates to a novel hydraulic waste pipe cleaner, and it consists in the employment of the pressure which is present in the water mains and pipes, and in a means for making a direct communication between the service-cocks and the waste pipe, whereby the pressure of the water pipe is transmitted to the waste pipe, and this pressure is enhanced to any desired extent.

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J. L. THARP—San Francisco.
B. W. CROWELL—California.
A. C. KNOX—Pacific Coast.
S. V. BLAKESLEE—California.
G. W. MCKEW.—Santa Clara county.
J. B. BACHELOER.—Shasta County, Cal.
JAMES ROGERS—Oregon and Washington Ter.
THOS. H. MANNING—Nevada, Idaho and Montana Ter.
CAPT. W. H. SSAMENS—Arizona.
M. P. OWEN—Santa Cruz County.
H. E. HALLETT—Los Angeles County.

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Chew JACKSON'S BEST Sweet Navy Tobacco

GENERAL MERCHANDISE.

[WHOLESALE.]

WEDNESDAY M., November 19, 1879.

CANDLES.	
Crystal Wax	17 @17½
Pickle	12 @—
Patent Sperm	30@—
CANNED GOODS.	
Assorted Pie Fruits, 2½ lb cans	2 25 @ —
Table do	3 50 @ —
Jams and Jellies	3 75 @ —
Pickles, qr gal	3 25 @ —
Sardines, qr box	1 67½@1 90
Hf Boxes	2 50 @2 75
Merry, Faull & Co's. Preserved Beef, 2 lb. doz	3 75 @4 00
do Beef, 4 lb. doz	6 50 @ —
Preserved Mutton, 2 lb. doz	3 75 @ —
Beef Tongue	6 50 @ —
Preserved Ham, 2 lb. doz	0 50 @ —
Deviled Ham, 1 lb. doz	5 50 @ —
do Ham, ½lb. doz	3 00 @ —
Boneless Pigs Feet, 3 lbs	4 50 @ —
2 lbs	3 75 @ —
Spiced Fillets, 2 lbs	4 25 @ —
Head Cheese, 3 lbs	4 25 @ —
COAL—Jobbing.	
Australian, ton	6 50 @ 8 00
Coos Bay	— @ 5 75
Bellingham Bay	— @— —
Seattle	6 00 @ 7 00
Cumberland	12 00 @14 00
Mt. Diablo	4 75 @ 5 75
Lehigh	11 50 @12 50
Liverpool	6 00 @ 6 50
West Hartley	— @ 9 50
Scotch	— @ 9 50
Scantling	— @— —
Vancouver Id	7 50 @— —
Charcoal, sack	75 @— —
Coke, bush	50 @— —
COFFEE.	
Sandwich Id, lb.	— @— —
Costa Rica	16 @ 16½
Guatemala	16 @ 16½
Java	25 @— 26
Manila	17 @— —
Greund, in cs	25 @— —
FISH.	
Sac'to Dry Cod	— 2½@ —
do in cases	— 3½@ —
Eastern Cod	— @— —
Salmon, bbls	7 00 @ 7 50
Hf bbls	3 50 @ 4 00
1 lb cans	1 40 @ 1 50
Pkld Cod, bbls	— @— —
Hf bbls	— @— —
Mackerel, No. 1. Hf Bbls	9 50 @10 00
In Kits	3 00 @ 3 25
Ex Mess	3 50 @ 3 75
Pkld Herring, bx	3 00 @ 3 50
Boston Smkd H'g	50 @— —
LIME, Etc.	
Plaster, Golden Gate Mills	3 00 @ 3 25
Lead Plaster, tn	10 00 @12 50
Lime, Sta Cruz, bbl	1 25 @ 1 50
Cement, Rosendale	2 00 @ 2 25
Portland	4 00 @ 4 50
NAILS.	
Assrted sizes, keg	4 25 @ 4 75

OILS.	
Pacific Glue Co's Neatsfoot, No 1	1 00 @ 90
Castor, No 1	1 30 @ —
do, Nn. 2	1 20 @ —
Baker's A A	— @1 30
Olive, Plagniol	5 25 @5 75
Possel	4 75 @5 25
Palm, lb	9 @ —
Linseed, Raw, bbl.	85 @ —
Boiled	90 @ —
Cocoanut	60 @ —
China nut, cs	72½@ 73½
Sperm	1 40 @ —
Coast Whales	35 @ 45
Polar	— @ 45
Lard	80 @ 90
Oleophine	— @ —
Bee's Brit's	16 @ 17½
Photolite	— @ —
Nonpariel	— @ —
Eureka	19 @ 20
Barrel kerosene	20 @ —
Downer Ker	30 @ —
Elaine	34½@ —
PAINTS.	
Pure White Lead	8 @ 8½
Whiting	1½@ —
Putty	4 @ 5
Chalk	1½@ —
Paris White	2½@ —
Ochre	3½@ —
Venetian Red	3½@ —
Averill Mixed Paint, gal. White & tints	2 00 @2 40
Green, Blue & Ch Yellow	3 00 @3 50
Light Red	3 00 @3 50
Metallic Roof	1 30 @1 50
RICE.	
China, Mixed, lb	4½@ —
Hawaiian	6½@ —
SALT.	
Cal. Bay, ton	17 00 @24 00
Common	10 00 @12 00
Carmen Id	12 00 @25 00
Liverpool fine	18 00 @— —
SOAP.	
Castile, lb	8 @ 15
Common brands	4½@ 6
Fancy brands	7 @ 8
SPICES.	
Cloves, lb	47½@ 50
Cassia	19 @ —
Nutmegs	97½@1 10
Pepper Grain	14 @ 15
Pimento	19 @ 20
Mustard, Cal., ½ lb glass	— @1 25
SUGAR, ETC.	
Cal. Cube, lb	— @ 10½
Powdered	— @ 10½
Fine crushed	— @ 10½
Granulated	— @ 10
Golden C	— @ 8½
Cal. Syrup, kgs	70 @ —
Hawaiian Mol'sses	26 @ 30
TEA.	
Young Hyson, Moyune, cst	— @ 51
Country pckd Gunpowder & Imperial	— @ 42½
Hyson	30 @ 35
Fooo-Chow O	35 @ —
Japan, 1st quality	40 @ —
2d quality	20 @ 2

METALS.

[WHOLESALE.

WEDNESDAY M., November 19, 1879.

IRON.—	
American Pig, soft, ton	28 00 @35 00
Scotch Pig, ton	26 00 @30 00
American White Pig, ton	25 00 @— —
Oregon Pig, ton	28 00 @35 00
Refined Bar	4 @ 8
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 8
Norway, according to thickness	7 @ 8
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @ —
TIN PLATES.—	
10x14 I O Charcoal	8½@ 9
10x14 I O Ooke	7 @ 7
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb, less than cask	9½@— 10
NAILS.—	
Assorted sizes	3 50@4 50

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & CO.]

SAN FRANCISCO, November 19, 3 P. M.

SILVER, ¼.

GOLD BARS, 890@910. SILVER BARS, 10@18 ⅌ cent. discount.

EXCHANGE on New York, 20, on London bankers, 49½@49¾. Commercial, 50; Paris, five francs ⅌ dollar; Mexican dollars, 92.

LONDON Consols, 98¼; Bonds (4%), 106⅜

QUICKSILVER in S. F., by the flask, ⅌ lb. 40@42½c.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Alpha Hydraulic Gravel Mining Company.

Location of principal place of business, San Francisco, California. Location of works, Washington Township, Nevada County, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the Second day of October, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
Alexander Girvin	8	1000	800 00
Mrs. Catharine Girvin	9	1000	200 00
Thomas Redmayne, Trustee	3	500	100 00

And in accordance with law and an order of the Board of Directors, made on the second day of October, 1870, so many shares of each parcel of said stock as may be necessary will be sold at public auction at the office of the company, 216 Sansome street, San Francisco, Cal., on the Thirteenth day of December, 1879, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

JAMES IRELAND, Secretary.

Office, No. 210 Sansome street, San Francisco, Cal.

Butte Hydraulic Mining Company.—Principal place of business, San Francisco, California. Location of works, Butte county, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 31st day of October, 1879, an assessment of Ten Dollars per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary, at room 3, No. 220 Sansome street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 2nd day of December, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the Twenty-second day of December, 1879, to pay the delinquent assessment, together with the cost of advertising and expenses of sale.

L. L. DENNERY, Secretary.

Office, Room 3, No. 220 Sansome st., S. F., Cal.

Cataract and Wide West Hydraulic Gravel Mining Company.

Principal place of business, San Francisco, California. Location of works, Elo Mining District, Calaveras County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 15th day of November, 1879, an assessment of Twenty five cents (25 cts.) per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary at 26½ Kearny street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on Monday, the 22d day of December, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 12th day of January, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

WM. B. LAKE, Secretary.

Office, 26½ Kearny Street, San Francisco, Cal.

Land Purchasers' Association.—Location of principal place of business, San Francisco, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 5th day of November, 1879, an assessment of six dollars ($6) per share (being the balance of the 43d installment on the subscription to the stock), was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at No. 641 Sacramento street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 4th day of December, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before will be sold on Saturday, the Third (3d) day of January, 1880, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors. C. S. WRIGHT, Secretary.

No. 641 Sacramento street, San Francisco, Cal.

Numa Mining Company.—Principal Place of business, San Francisco, California. Location of works, Humboldt County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 23rd day of October, 1879, an assessment (No. 2) of Two Cents (2) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 328 Montgomery St., room 21, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 24th day of November, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 15th day of December, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

DAVID WILDER, Secretary.

Office, 328 Montgomery St., Room 21, San Francisco, Cal.

POSTPONEMENT.—The day of delinquency of the above assessment is postponed to December 22nd, 1879, and the day of sale to January 12th, 1880. By order of the Board of Trustees. DAVID WILDER, Secretary.

Room 21, 328 Montgomery street, San Francisco.

Annual Meeting.—Office of the Godfrey Gravel Mining Company.

NOTICE.—The annual meeting of the above named company will be held at the office of the company, 309 California street, rooms 3 and 4, second floor, on Monday, the 1st day of December, 1879, at 2 o'clock P. M. of said day, for the election of a Board of Directors, and such other business as may come before said meeting. Transfer books will be closed on Saturday, 22d day of November, 1879, at 12 o'clock M.

J. M. BUFFINGTON, Secretary.

D. H. TWING, President.

ANNUAL MEETING.

Napa Con. Quicksilver Mining Company.

The regular annual meeting of the Napa Consolidated Quicksilver Mining Company will be held at the office of the Company, room 7, Safe Deposit Building, 328 Montgomery street, San Francisco, California, on Wednesday, the twelfth day of November, 1879, at the hour of 2 P. M., for the purpose of electing a Board of Directors to serve during the ensuing year, and the transaction of such other business as may come before the meeting. Transfer books will close on Saturday, November 8th, 1879.

WM. W. PARRISH, Secretary.

Office, room 7, Safe Deposit Building, 328 Montgomery street, San Francisco, California.

POSTPONEMENT.—The annual meeting of the above named Mining Company is hereby postponed until Wednesday, the 26th day of November, 1879, at the same hour and place. W. W. PARRISH, Secretary.

Stock Dividend Notice,

OFFICE OF THE

Gila Silver Mining Company,

Room 7, Safe Deposit Building, No. 328 Montgomery St., San Francisco, Cal., October 21, 1879.

At a special meeting of the stockholders of the above named Company, held this day, a Stock Dividend of 20 per cent. was declared, payable immediately, out of the capital stock owned by the Company.

All stockholders are requested to send their stock to the office of the Company before NOVEMBER 24th, 1879, and receive the dividend due thereon.

WM. W. PARRISH, Secretary.

POSTPONEMENT.

Diana Mining Company.

The day of delinquency of the above assessment is postponed to November 17th, 1370, and the day of sale to Friday, the Fifth day of December, 1870. By order of the Board of Trustees.

J. T. McGEOGHEHAN, Secretary.

Office, 318 Pine St., rooms 13 and 14, San Francisco.

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THOS. PENDERGAST. HENRY S. SMITH.

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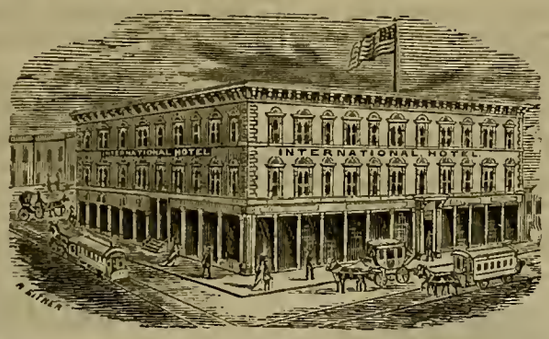

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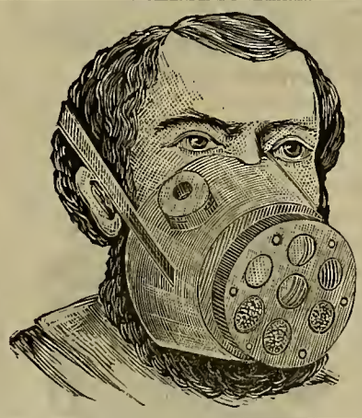

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No. 1 XX) is the Strongest Explosive Known.
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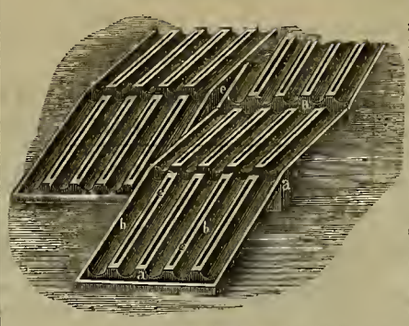
Howland's Under-current, Mill and Sluice Riffle.



This invention meets a want which has long been felt by Gravel Miners and Millmen, viz: that of a simple, cheap Riffle which will save the largest possible amount of gold or sulphurets, with the least possible waste of quicksilver. That this Riffle answers all these conditions will be apparent to any practical man who takes the trouble to examine it. The arrangement of this Riffle is such that there is a strong, unobstructed upper-current to carry off and break up the gravel or cement, and a slow under-current, checked by numerous riffles, which give gold or sulphurets a better opportunity of settling than if they were exposed to the force of the main current.

In this Riffle there are cast troughs for the quicksilver, which extend entirely across the sluice, and while they are so placed that the current will naturally pitch towards them, and give every opportunity for amalgamation, the quicksilver is fully protected from flouring or leakage. There is no mechanical skill required in taking out or replacing the sections.

Full particulars in regard to this invention can be obtained by applying to

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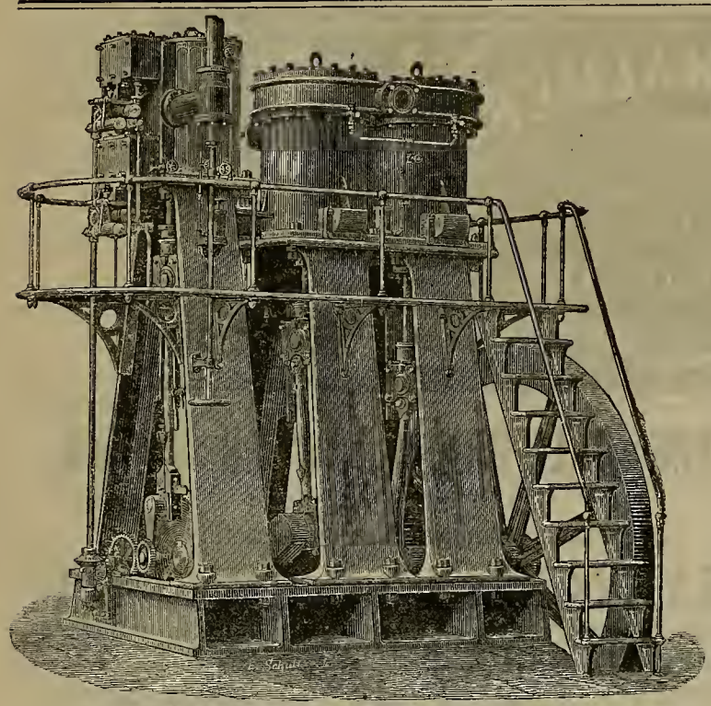

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An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO., Publishers.

SAN FRANCISCO, SATURDAY, NOVEMBER 29, 1879.

VOLUME XXXIX Number 22.

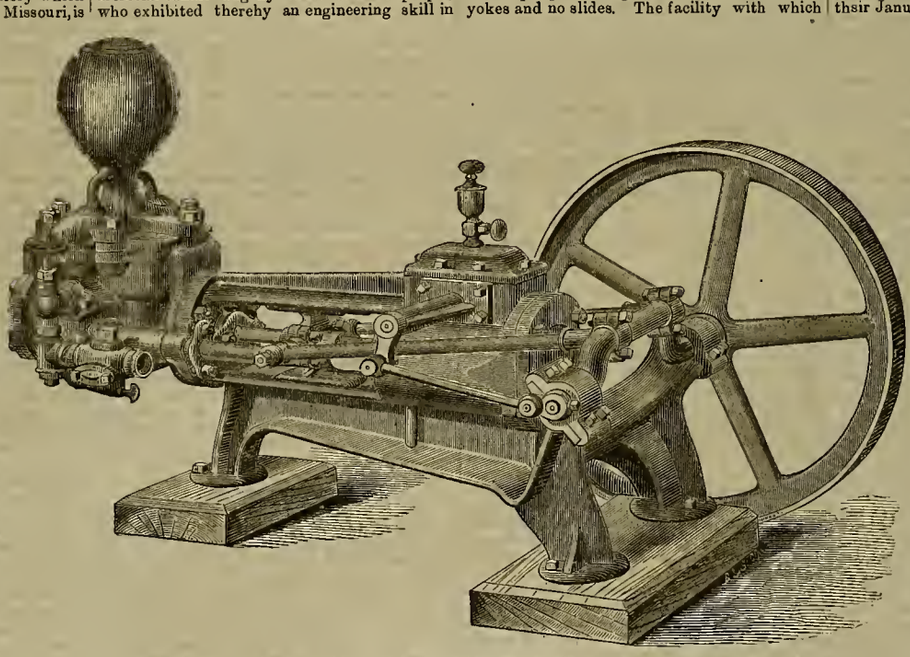
Superiority of Prehistoric American Wares.

It is assumed as a fact by Mr. Conant in his new work entitled "Footprints of Vanished Races," that the Indian tribes found in this country by the earliest European voyagers, were not the race which originally inhabited the continent, nor even the descendants thereof, and that the race of people which preceded them were not the ancestors of the Indians, in fact, had nothing in common with them, and no traditions ever descended to them.

There are many evidences which are cited to support this view of the matter, and one in particular, which demonstrates that the prehistoric American was a superior being to the prehistoric European. From the articles fashioned by their hands, their pottery and other wares, there is no doubt of the superiority of American prehistoric wares over those of Europe. The number of vessels of pottery which have been taken from the mounds in Missouri, is prodigious, and almost endless in variety. In one instance nearly one thousand pieces of various sizes and great diversity of form and workmanship were obtained from a single burial mound. Although the skill displayed in everything these remote people manufactured from clay is superior to their cotemporaries in the so-called old world, there are many striking resemblances common to both. In the ceramic arts particularly, great ingenuity is displayed, and the fortunate fact that earthenware is of an almost imperishable nature, has enabled us to obtain and preserve the records of these ancient races and draw quite correct conclusions from the analogies presented in their successful attempts imitate to the forms of beasts and birds which were seen every day. Particularly is this contemplation, observation and affectionate communion with nature observable in the potteries of the ancient Americans. Dr. Foster, in his "Prehistoric Races of the United States," says that in the plastic arts the Mound-builders attained a perfection far in advance of any samples which had been found characteristic of the Stone, and even the Bronze Age of Europe. Sir John Lubbock remarks that "few of the British sepulchral urns, belonging to the ante-Roman times, have upon them any curved line. Representations of animals and plants are almost entirely wanting." They are even absent from all the articles belonging to the Bronze Age in Switzerland and in Western Europe generally, while ornaments of curved and spiral lines were eminently characteristic of the American Mound-builders. The ornamental ideas of the Stone Age were confined, so far as we are able to ascertain, to compositions of straight lines, and the idea of a curve scarcely seems to have occurred to them. The most elegant ornaments on their vases were impressions made by the finger nail, or by a cord wound round the soft clay. "The commonest forms of the Mound-builders' pottery represent kettles, cups, water-jugs, pipes, vases, etc.," continues Dr. Foster. Not content with plain surfaces, they frequently ornamented their surfaces with curved lines and fretwork. They even went further, and molded images of birds, quadrupeds, and of the human form. The clay, except for their ordinary kettles, where coarse gravel is often intermixed, is finely tempered, so that it did not warp or crack in baking. The utensils, when completed, had a yellowish or grayish tint.

Some of the small jugs or bottles have nicely adjusted stoppers, and the bottles themselves made of much finer materials than ordinary wares, and quite thin, but so well baked that they seem as tough and strong as our own ware. The outlines of the human faces and heads of birds, although somewhat crudely expressed, exhibit much to admire, especially in the forms of the birds themselves. The flow of their outlines evinces a degree of refinement of feeling which could only result from a culture of the sense of beauty, requiring a long time for its realization. In the case of heads, the openings of the jugs, or the mouths, were all made on the back side of the head—a uniform practice. In the representations of the human figure such fidelity to nature is observable that it is difficult to believe that they are not portraits. Different varieties of ducks were molded in which the shape of the head, line of neck, etc., together with the nicest distinctions, in particular varieties, are expressed with remarkable skill.

The evidences of man and animals in the remote ages of prehistoric time seem to demonstrate that evolution had not then commenced, but that the types which existed then are the same as the objects that exist now. The whole subject is one of intense interest, inasmuch as future discoveries may establish the theory that the cradle of the human race existed in America. Many of the bayous on the Mississippi river have been demonstrated to be artificial canals dug by these ancient people, who exhibited thereby an engineering skill in addition to their artistic accomplishments, which moderns are not slow to copy.



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Combined Steam Pump and Engine.

We illustrate herewith the Cope & Maxwell Manufacturing Co's. patent double acting crank and fly wheel steam pump, which is admirably adapted for furnishing motive power for other work at the same time.

The pump piston rod can easily be disconnected by the removal of a key from the cross-head of the engine, forming a simple, compact and powerful steam engine, having all the advantages of the best stationary engine.

The framing, slides, steam cylinder, steam chest and crank, shaft bearings, are cast in one piece and the arrangement of the entire machine is so simple and convenient that full access is had to any one part without disturbing any other. The machine is provided with a good cross-head and ample bearing on slides; the pitman connections are very long so they have no tendency to force the piston and pump rod sideways in the stuffing boxes, thus avoiding the great trouble and annoyance incident to those pumps having short pitmans, Scotch yokes and no slides. The facility with which it can be converted from a pumping engine to a motive power makes it specially convenient for general purposes. It may be used by railroad companies at stations for filling water tanks, sawing wood, hoisting freight, etc. Hotels and public institutions may employ it to furnish their water supply, run their washing machines, mangles, elevators, and for all general uses for which they require power. Gas works find it adapted to their wants for supplying water, running the gas exhauster, etc.

The piston pumps made by this company have a copper lining in the water cylinder; have valve seats and stems; vulcanized rubber valves for cold liquid and metal valves for hot. Various styles of pumps are made by the Cope & Maxwell Co., for whom Messrs. Parke & Lacy, 21 and 23 Fremont street, are agents. This firm have just fitted up a spacious establishment at the address given, their old place on Market street having become too small for the requirements of a much enlarged trade.

Salmon River Improvements.

It appears that the region of country about the sources of the south fork of the main Salmon, Wood river and the southern branch of the Boise river in Idaho, have been thoroughly prospected during the past summer, the work resulting in the discovery of a great number of valuable gold and silver-bearing ledges. Enough has been accomplished to establish the permanence and value of these ledges, and to open up a new and rich field for future mining operations. The mineral belt in which these discoveries are located, extends from the old emigrant road on Wood river to the valley of the South Salmon a distance of about fifty miles.

The country, however, is not settled, and means of communication are wanting, particularly good roads, without which developments must be delayed indefinitely. To meet this want several parties of Rocky Bar have formed an association and given notice that they will make application to the Board of County Commissioners of Alturas county at their January session, for a franchise or privilege to construct a wagon road from the Lower Wood river, through this belt of new mines to Bonanza City.

The mining districts which will be traversed or very nearly approached by this road, are Mineral Hill district, ten miles above the point of starting on Wood river, where a large number of rich ledges have been discovered. This district is situated on the west side of Wood river. Next follow the Jim Wincher, Warm Springs, Little Smokey and Black Bark districts, when we come to Wood River district, where Galena City has been located and laid out. Thence crossing the divide at the head of Wood river to the waters of South, Salmon, Smiley, Sawtooth and Lake districts are passed. In most of the ledges in all these districts very rich ore has been found, and some of the ledges have already been bonded for large sums.

It is confidently expected that the coming year will witness the completion of the extension of a branch of the Utah Northern railroad to Wood river, for the purpose of securing the Idaho trade.

The starting point of the proposed wagon road is on the survey already made for the line of the railroad. The entire length of the wagon road from Lower Wood river to Bonanza City, will be about 103 miles, which will be from 60 to 75 miles nearer to the line of the railroad than by the way of Challis.

TRINITY COUNTY QUICKSILVER MINES.—Some time ago we published a list of five counties in California which contained quicksilver mines. Trinity county was not mentioned for the reason that we had no data concerning the product of that county. The *Weekly Trinity Journal* has obtained information about the Altoona mine, in that county, and says: "Mr. Ch. Allenberg, Secretary of the Altoona quicksilver mining company, has kindly answered our inquiry with the information that the product of the Altoona mine for the last three years amounted to 5,674 flasks of quicksilver. This is 987 flasks more than was produced by the Oakland mine, in Sonoma county, for the same period." The quicksilver industries of this State are very important. The development of our gold mines will give quicksilver an impetus which will finally establish its production upon a safe paying basis, which market fluctuations elsewhere cannot affect to any great extent.

ONE of the mines of the Pennsylvania coal company at Pittston, Pa., has caved in. The damage will be considerable, and will throw a large number of men out of employment for some time.

A PRIVATE letter from a well-informed person at St. Petersburg states that intelligence has been received in official circles at St. Petersburg to the effect that the British government intends to occupy Herat next spring, in alliance with Persia. The writer adds that the news is generally credited.

PULVERIZER AND AMALGAMATOR.—Edward Y. Harrison, of Victoria, has perfected some improvements in "Berdan basins," comprising machinery for both pulverizing and amalgamating. The improvements have reference to that class of pulverizing and amalgamating appliances in which a mechanical pulverizer rolls around the inside of a rotating basin set at an angle, like what is commonly known as the Berdan basin. The side and bottom of the Berdan basin form one continuous curve, so as to accommodate themselves to a ball or spherical pulverizer. Mr. Harrison, however, makes his basins with flat bottoms and sides, placed at such an angle to each other as to accommodate themselves to a conical pulverizer resting and revolving on the side or wall. He also introduces a ledge, projecting inward from the upper part of the side or wall, in which ledge are openings for the passage of the material treated. The latter improvements may be applied to an ordinary Berdan basin, if that shape of bottom be preferred.

THE merchandise exports of the past week at San Francisco were valued at $676,464, a decrease of $154,006 on those of the previous week.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

The Debris Question or Cleaning the Rivers for the Gold.

EDITORS PRESS:—This question, which at first attracted but little attention among miners, has since the action taken by the city of Marysvills, and the decision made by Judge Keyser on the subject, becoms one of considerahle importance, and must receive a consideration not before given it.

At first hlush one will say, it is right to stop this eternal drifting of the mountains to the seas—the raising of river beds, hy which towns and lands are inundated every season, and, that unless a stop is put to it, we may expect in time to see the mountains leveled to their base, and the bay of San Francisco transformed into an arid desert.

While there is cause for attention to the matter, the whole proceedings against the hydraulic miners has a very farcical cast, and certainly unworthy the spirit of the age, and of California spirit especially, when we consider the fact that mining built the city.

It would have been much more to the credit of the corporation of Marysville, to have offered a reward of $1,000 or $5,000, if you please, for the hest plan for overcoming the difficulty, rather than commence suit against the gravel miners of the Yuha, and thus seek to destroy so important an industry as hydraulic mining. That gravel mining is to he ahandoned in this State, because the debris washes towards the sea, through sloughs, ravines and rivers tending hitherward, is simply an absurdity. When it comes to overflows, Marysville and all the surrounding country, was deluged before ever hydraulic mining began, and oftener before than since.

We will admit the fact that the debris during the drier part of the seasons fills the river, but it is unreasonable to suppose that if a smaller hody of water will hring down the debris and fill the river then, that the larger hody of water occasioned hy the winter rains, and which sometimes raises the streams 30 to 40 feet in a day, will not carry the debris previously deposited on and out, and with the swiftness with which the waters come down, so that we may say the overflow is not so much on account of debris previously deposited as the unexpected rush of immense bodies of water and debris.

There are many questions to hs considered in connection with this debris subject, and at the end of it, we certainly will he wiser than we are to-day; and I douht not hut the State and people will he benefited hy the agitation, and the injury to the gravel interest he hut temporary. As before observed, it would have been more prudent for Marysville to have pursued a different course at all events, as she has let the worst go on for 25 years without complaint, and could have stood it a year or two more, in endeavoring to solve the problem, to no ones disadvantage, and for the good of all concerned. We know, that in every mining obstacle, the times have brought forth a something wherehy all disadvantages were overcome. When we look to the days of the rocker, and up to the period when it ceased to pay, we find there comes in the sluice har and "tom," hy which man's labor was rewarded. This, in course of time becoming unprofitable with hand labor, genius hrought forth the pipe and "giant," and still labor moved on with proper compensation. And so it is in every requirement. Some way or other we override the difficulties. And so should this question he considered: not how to destroy hydraulic mining, hut as to the hest plan for ohviating any disadvantages that arise from it. It strikes my mind that the times have hrought forth, as far as the rivers are concerned, the very machinery to accomplish the work, and in fact, the debris can he turned to such a benefit, that the more the miner will shovel the sand towards the rivers the hetter the lower counties will like it. There hae recently been invented and hrought into practical use a centrifugal pump, having a capacity for raising, say 6,000 cubic yards of earth every 24 hours, and elevating the same 20 feet above the water line. By a mechanical device, this pump has a sweep of 40 feet, so we may say it can clear the river hed 40 feet and deposit the debris on the low lands, elevating and enriching much of it at the same time. Then here comes in another question. To clean the Yuha, American, San Joaquin and Sacramento rivers in this way, what may he the gold product hy washing this material after raising it, and in the operation of depositing "on shore?" Who knows, there may he "hig money" in the operation of handling 6,000 cubic yards of these river sands every 24 hours, and in thus washing it for gold, to say nothing of the extra wheat crops which the new land would yield, or the improved value of the landed property. As to the gold question, many years ago, I had the "muddy water" of the Sacramento river, opposite Sacramento city, tested, and enough gold was obtained, which, when calculated hy thousands of gallons of the water flowing daily, made millions of gold which yearly flowed on to the ocean. (I published a statement at the time.) If so much gold passes on in "muddy water," how much coarser gold must hs deposited in these rivers which receive the dshris from the mountains. With machinery such as I speak of, enlarged if you please, sweeping these rivers, moving, say, 10,000 tons a day, how long would it take to settle this debris question? We will set this gold question on one side, and simply take up the clearing the rivers and securing the main land from overflow. One of the most sensible propositions on the subject, to my mind, was published in the *Chronicle* of this city some 10 days ago, entitled "Rivers, and River Diking." I will extract as follows:

"The natural channels of our rivers from the points where they enter the level plains and agricultural lands are not large enough to carry the waters drained into them in a very rainy season. They never were large enough. The floods of 1849 and 1852, which occurred years before the era of hydraulic mining, and when the low-water level at the State capital was 16 feet lower than it is now, deluged that city and all the plaine region as much as the floods of 1862 and 1867. An equal rainfall this year or next would probahly overflow even the high dikes erected along the Sacramento for the protection of that region, unless the dikes on the Yolo side should give way and afford an outlet above the city for the escape of the surplus water.

* * * * *

"If, then, we should assist nature hy widening the channels of our rivers from the points where they enter the plains, and are liahle at every season of extraordinary flood to deluge the country and destroy the land and crops hy discharges of debris, wo would not only he secure from these periodical floods, but turn a positive evil into a great benefit.

* * * * *

"In other words, instead of hnilding the dike close up to the water, as has been the uniform practice, it should he constructed a hundred or two hundred feet back from the natural channel.

"The natural hed of the Sacramento at the railway hridge is about 800 feet. If the dikes on hoth sides had been constructed, say 400 feet back from the natural banks of the stream, the new channel would be large enough to carry all the waters discharged into the river by our highest floods. Its capacity would he just double what it is. A dike five feet high would secure the country against overflow as well as one of ten feet in a channel of only half the width. The loss hy the adoption of this plan would he nothing more than the narrow strip of land surrendered to the river channel. The gain would he the difference of the labor and expense of constructing and maintaining a dike five feet high and one of ten feet. It would in the course of a few years pay hack ten times over the value of the surrendered land, and every land-owner would he supplied with the means of unlimited irrigation at the lowest possible expense. For the season when irrigation for our staple crops is most needed is the season of high water, when the rivers are above their natural hanks."

Now suppose this proposition was entered upon, how insignificant would he the loss by expense, when compared with the question of the profit to the State of an industry like hydraulic mining. Now I will throw in a suggestion in connection with the above, or rather make a combination. 1st. Widen the streams hy diking them hack, as suggested in the *Chronicle*. 2d. Use the hest and most powerful centrifugal pumps to elevate the sands. 3d. Wash the sands for gold as it moves from the boat to the shore. 4th. Make with the debris acres for grain production, thus often turning non-producing lands into producing; and as the State receives all the advantages of the work (1) hy taxation on the increased value of all the landed property thus benefited; (2) hy the production of gold, which I am satisfied would be no insignificant sum; (3) hy the preservation of the hydraulic mining interest, and let the State assume, under certain regulations, the work and its attendant expense, creating reclamation dues upon a just basis to he paid hy parties benefited, or sale of State bonds.

As I view the matter, it will not he found so great or expensive a job when once undertaken. With all these later inventions for the handling of immense hodies of earth hy machinery, I am not too sure that the rivers will not soon be located and worked for the gold to he obtained hy washing. In this event provision should he made to deliver the debris on shore, instead of returning it to the river. That we have in this State hoth engineering and mechanical skill to accomplish all this work I am quite sure; and in consequence the debris question need not he considered such a "hughear" as to retard gravel mining, frighten the citizens of Marysville, or cause our learned judges to scratch their heads for wise words on the question. These ideas I give for what they are worth, as out of the thoughts of the multitude there may he some good suggestions, for men sometimes "speak wiser than they know." In all our thoughts and movements we must start out with the proposition that hydraulic mining must go on—debris or no debris. To say, or for a moment to think, that this great industry, with its $100,000,000 of capital invested, and hundreds of millions of prospective production, is to he stopped is simply ridiculous; especially while we are so uncivilized as to use gold and silver as a currency. The abolition of hydraulic mining, and the abolition of the metals as a currency, must be argued together and considered as the same question. If one should go, the other should. In all this argument I leave out the question of destroying farms away from the river borders hy overrunning them with debris, for the reason: Every mining company so doing, hy law, is liahle and must pay for damages, which is accepted hy the miner as justice to the farmer. The real question of controversy and conflict, as I understand it, is the debris of the rivers.

Every good citizen desires to protect the farmer, hut in doing justice to him, must do justice to the mining interest as well. We all admit that the farm marks the "higher civilization," while gold is hut trash, which the haseness of the age looms into a false god; encompassing, seemingly, all that is wise, virtuous, great and holy. And while it holds such sway, it demands protection.

The effort of both miner and farmer should he to do justice to each other, and devise that plan which advances in interest of hoth without inflicting a serious injury on either.

ALMARIN B. PAUL.

San Francisco, November, 1879.

Como, Nevada.

EDITORS PRESS:—Your correspondent visited this active little camp on the 12th inst. This is one of the early camps of 1860-62. There was a large town built here at that time, and we are told the population was about 1,000; hut the wild excitement and anxiety of the people to make fortunes in a few weeks, together with a lack of experience and want of mills, caused the camp to be abandoned to the lonely solitude, in which it reposed until last spring, when the Eureka hoys commenced to prospect one of the old lodes, now called the Eureka, which seems to be a nice location. Free gold and silver sulphurete can he seen in the rock. There are about 220 tons of ore on the dump. We were informed that the average assay was $60. Silver and gold specimens from the mine have assayed up in the thousands. The West Rapidan is down 175 feet; incline shaft with good ore in sight. The Jacket is down 48 feet; still cleaning out old works. The Chieftain is another good lodge. It is worked by an incorporated company. They are now down 200 feet and have a two-compartment shaft nicely timbered. At present erecting a whim.

There are several other good lodes in the district. A snow storm raging at the time prevented us from examining them. The citizens are composed of the hardy class of early pioneers that know no such word as fail. There are about 120 men in the camp, all heing at work. One lodging-house, one livery stable, one saloon and one hotel comprise the business houses of the town. Mr. Wm. Rose is local surveyor, and will soon have a blacksmith shop in connection with his business. Mrs. Ely and her two daughters are the only white ladies in camp. Every one here is hopeful of Como's future. At Palmyra, a mile from here, Mr. A. Welton is building a 10-stamp mill to treat ore hy wet crushing and raw amalgamation in iron pans. The mill will be in operation hy the 25th inst. If it proves a success in working the ore it will infuse greater life into the camp.

There is at present no small amount of speculation going on in the purchase of town lots and interests in the mines. There is no doubt whatever hut Como will have a large active population hefore spring opens. Wood is plentiful at $4 to $6 per cord. There is good healthy spring water for domestic purposes in the town location. Everything has the appearance of health and prosperity in and about the camp.

T. H. M.

THE DEEPEST WELL IN THE WORLD.—The sinking of the deep artesian well near Buda Pesth, Hungary, is now completed; the works were commenced as far back as 1868, and during their progress many interesting facts relating to geology and underground temperature have been brought to light. The total depth is 3,200 feet, and the temperature of the water it yields is nearly 165° Fahr. The temperature of the mud brought up hy the borer was taken every day, and was found to increase rapidly, in spite of the loss of heat during its ascent, down to a depth of 2,300 to 2,700 feet. Beyond this point the increase was not so marked. At a depth of 3,000 feet the temperature was 177° Fahr., giving an average increase of 1 for every 23 feet bored. Water first commenced to well up at a depth of 3,070 feet; here its temperature was 110° Fahr., and from this point onward it rapidly increased both in quantity and temperature. Thus, at 3,092 feet, its temperature had already risen to 150° Fahr., and the yield in 24 hours from 9,500 to 44,000 gallons. Finally, when the boring had reached 3,200 feet, at which point it was stopped, the temperature of the water, as it burst from the orifice of the tube, was 165° Fahr., and the volumetric yield 272,000 gallons in the 24 hours. This yield was afterward reduced to 167,200 gallons, in consequence of the bore being lined with wooden tubes, which reduced its diameter. The water obtained disengages carbonic acid in abundance, and also contains nitrogen and a little sulphureted hydrogen, and 80 grains per gallon of fixed matters, chiefly sulphates and carbonate of potash, soda, lime and magnesia.

THE Board of Managers of the Produce Exchange, of New York, have refused to grant the request of the grain dealers' to drop the cental system, and the system goes into effect Jan. 1st.

Sonora, Mexico.

So much is said about the State of Sonora in Mexico, that we may be pardoned for publishing the following account of it taken from the St Louis *Globe-Democrat:* The famous old *De Bow's Review* has been revived, and we have before us the first number of the new series. In it is the first translation from Spanish into English of a work upon the geography and statistics of Sonora, published four years ago in the City of Mexico. The origin of the first inhabitants is lost in the obscurity of ages, and the richest and most prolific imagination loses itself in the confusion of conjectures, more or less well founded, regarding the condition of the numerous and diverse tribes, which formerly inhabited this soil, so favored hy the hand of the Creator. This portion of the Mexican territory was discovered hy a subject of Spain in 1539. Upon his report an expedition to explore the country was fitted out, at an expense of over $650,000, hut it was unsuccessful. Between the date of this failure and 1596, four other attempts at the conquest of the country were undertaken, at an aggregate cost of $9,240,000. Like the first invasion, they resulted in failure.

During the subsequent 150 years, the Jesuits, hy means of missions, succeeded in converting Sonora into a theocracy, comprising 66 towns, governed by 24 missionaries. In 1824, after many internal wars and rebellions, Sonora and Sinaloa became a free and independent State, as regarded its domestic government. In 1839 these were divided and Sonora became an independent commonwealth, extending from 26° 39′ 41″ to 32° 25′ north latitude, and from 9° 19′ to 15° 49′ 52″ longitude west of the meridian of Mexico, and bounded north hy the United States.

The climate of Sonora is rather hot than temperate, although in the central and northern portions sharp winds blow and snow sometimes falls. The chief malady is small-pox, which is seldom epidemic. The prevailing winds are very pure, and there are no marshy lands or stagnant waters. The medium duration of life among the natives is from 70 to 75 years, and among those not born there it is from 60 to 65 years; hut there are many cases of life much more prolonged. Wheat, maize and most of the American vegetables are produced abundantly in this soil. Of fruits there are orangee and lemons, both sweet and sour, peaches, pears, figs, pineapples, cocoanuts, limes, dates, bananas, and many others.

There may he counted more than a thousand indigenous plants known to the natives which contribute to the cure of the various diseases, some of which are the true antidotes against the bites of poisonous insects and reptiles. Besides many kinds of timber common to the northern latitudes, Sonora grows in abundance Brazil-wood, sandal-wood, balsam, rose, ebony, mahogany and aloe. Cotton is raised, although not until the seed has been two years in the ground. It is liable to he destroyed hy an insect which attacks the root. Rivers, large and small, cross the country in every direction. In the esculent and nutritious pastures of the beautiful valleys, mules, cattle, swine, sheep and horses grow rapidly and increase abundantly.

Wild sheep, deer, wild boar, bear, the Mexican bull and buffalo are found in different parts of Sonora, while the otter, the water-dog, beaver, crocodile and alligator frequent one or the other of its various streams. The lion, leopard, tiger, panther and other wild beasts roam its forests. Vipers, centipedes and tarantulas are among its reptiles. Salmon, shrimp, trout and other exquisite fish abound. On its coast occur pearl-diving, and white coral and ambergris are gathered.

The eastern portion of Sonora comprises the grand range of the Sierra Madre mountains, on whose elevated summits and sloping sides tower huge pines, beautiful firs and odiferous cedars (common and those of Lebanon), which, mingling with vigorous live-oaks and the mighty Druid oaks, form gigantic groups of silent spectators contemplating the grandeur of the basaltic rocks, the perfection of the marbles and porphyry, the extraordinary magnitude of the grains of gold, and the enormous masses of virgin silver, found almost on the surface of the earth, to compensate the toil and labor of those who seek, in occupation without degradation, the gifts which prodigal nature lavishes upon her sons.

TIN OXIDIZED BY CHARCOAL.—At the American Sanitary Association a block-tin tube was recently exhibited by Mr. J. W. Osborne, of Washington. The tube had been used in the construction of a filter for household purposes. It formed one leg of a syphon, and passed through a stratum of charcoal and one of pure sand, the water to be filtered rising high above the latter. The tube had been extensively used for 20 months, and the outside portion, which corresponded in position to that of the sand, was deeply pitted, oxide of tin having formed. This phenomenon could not be explained, though it was much debated.

A DISPATCH from Singapore says the king of Siam has sent the decoration of "The Golden Flower of Siam" to Hon. Thaddeus Fairbanks, inventor of the platform scales. This is the first time this distinction has ever been conferred on an American.

THE plan of having municipalities conduct their own gas works is gaining friends in England. The city of Manchester, during its last financial year realized a net profit of $476,000 from the gas works which it owns.

MECHANICAL PROGRESS.

Freidman's Ejector.

The ejector is not only very simple, but one of the most effective machines within recognized limits, for raising water and conveying liquids rapidly and economically by steam, that has yet been invented, and in many instances the only one that can properly do the work.

It is applicable in a great variety of forms for raising water and other fluids from tanks, wells, ponds, mines, quarries, holds of vessels, docks, gas works, wheel pits, and it is also well adapted for conveying liquids, of various degrees of consistency, from tank to tank or floor to floor in breweries, chemical works, distilleries, sugar refineries, and other similar establishments.

In outward appearance the ejector is a cylinder of irregular form, varying in length from six inches to three feet, according to size and capacity, and in circumference proportionately to its length. There are three apertures in each machine, one for steam, one for suction, and one for discharge, that which admits steam being much smaller than either of the other two.

In its internal construction this ejector is provided with a series of intermediate nozzles or cones, firmly fitted to the body of the ejector, by which the water from the suction pipe is admitted to the receiving chamber in successive streams.

The great utility of this arrangement (which is the vital principle of the ejector) lies just here. In the ejector the steam jet acts at first only on that portion of the incoming water which is admitted through the first nozzle or cone, so that only a comparatively small jet of steam is required to move it. This stream, propelled by the force of the steam, gives an impetus to the water entering through the second cone, and that in turn becomes a motor to the next, and so on until the last is reached. The water or liquid, accelerated in its passage through these successive nozzles or cones, as well by the force already described as by the vacuum always formed under such conditions, is carried with great velocity through the diverging pipe, with all the force and rapidity necessary to convey it to its required destination.

As a means of ejecting water in sinking shafts and crosscutting drifts these ejectors are valuable, as they can be adjusted to the work, as it progresses, by simply lengthening the piping, the slow process of keeping the water free by means of buckets or bailing out being thus dispensed with.

These ejectors are made in different ways for different purposes, but all equally simple in arrangement. We understand that Nathan & Dreyfus, 108 Liberty street, New York city, are in possession of full information on this subject.

HEAT OF CARBONS IN ELECTRIC LIGHT.—The temperature of carbons giving the electric light has been examined by M. Rossetti, by means of a thermopile, the face of which is placed at a suitable distance to receive rays from a radiating surface of determinate size; the thermal effect being measured by a sensitive reflecting galvanometer. He comes to the conclusions that—1. The positive pole has higher temperature than the negative. 2. The temperatures vary according to the intensity of the current. 3. They are higher, the smaller the radiating surface, provided it comprises the extreme point. 4. In the negative pole the minimum temperature was 1,910° Cent., with a large radiating surface of small brilliancy; the maximum 2,532° Cent., the radiating surface being half the preceding. 5. For the positive pole the minimum temperature was 2,312°, the carbon being large; the maximum 3,200°, with a thin carbon and small radiating surface.

THE SWIFTEST SHIP IN THE WORLD.—A new British war vessel called the *Mercury*, built of steel, has just been completed and successfully tried at Portsmouth, England. The vessel is 300 feet long, 46 feet beam, 16 feet 3 inches hold; displacement, 3,750 tons. On her late trial trip the engines developed 7,595 horse-power, and the speed attained was within a trifle of 22 miles an hour. These are remarkable results for a vessel of the dimensions given. The *Mercury* has twin screws driven by separate engines arranged in separate engine-rooms. Her machinery nearly fills the hull. There are 12 boilers; 4 high-pressure cylinders, 75 inches diameter; stroke, 3 feet; boiler pressure 60 to 65 pounds, coal consumed, 2.35 pounds per hour, per horse-power. One man governs the rudder, which is worked by steam. The vessel's armament will consist of 10 64-pounders.

THE ELECTRIC HOSE.—A new thing in fire apparatus is the electric hose. A wire runs along in the cotton or rubber part of the hose, continuing the connection as each section is attached, and over this passes electricity generated by one of the engine's fly-wheels. Connected with the nozzle is a little contrivance by which the engineer can be told, although squaree distant from the man who is playing water on a fire, to turn her on, cut her off, stop, or go ahead, or anything else that can be agreed upon by a signal which is struck on a gong on the engine.

PATENT FASTENER FOR MACHINERY.—The importance of properly securing all machinery to the estate of the individual or firm to whom it ostensibly belongs has been demonstrated in many instances. Numerous cases have occurred within the last few years where valuable machinery has, under the existing law in England, passed out of the hands of its proper owners into the absolute possession of the landlord of the freehold, or, in the case of the failure of a manufacturer or of a firm of manufacturers, a considerable portion of the plant has become lost to the debtor's estate by reason of its being attached to the freehold in the usual manner. A simple and effective means is now, however, available by which looms and other machinery may be securely fixed down to the floors of rooms in mills or elsewhere, while rendering the machinery separable from the freehold, and consequently not liable to be claimed by either landlord or mortgagee as fixtures. The contrivance to which we refer is the patent shoe of Messrs. Bentley and Ackroyd, of Bradford. It consists of a single iron casting and of a loose plate or cover, which can be attached to the broad part of the shoe by means of two screws at each end. In order to use it the shoe is placed with its flat side upon the floor, so that the two arms lie on each side of the foot of the loom or other machine which is to be fixed, and is firmly fastened down to the floor by a screw. The covering-plate is then placed over the foot of the machine, and screwed down tight to the shoe at each end; a pin is passed through a hole in the middle of the cover, and drops into a corresponding hole in the foot of the machine, in order further to secure it. Thus the only part which is fixed to the floor of the building, and consequently irremovable, is the shoe itself. —*English Exchange.*

AN ELECTRIC SENTINEL.—Those persons who have occasion to cross the Providence railroad on Washington street, at Forest Hill, Boston, have been frequently surprised to hear a heavy gong continually ringing on a danger-signal post close by, while no approaching train is seen or heard; but from three to five minutes after the alarm first sounds a train dashes around the curve and speeds along, while as it leaves the crossing the gong ceases to ring. This crossing signal is part of the system of the Union Electric Signal Company. It is known as the Union Electric Signal, and it is exceedingly simple. By this system electricity is carried in the rails, holes being drilled in the flanges, into which wire is inserted uniting the points. A one-gravity cell battery is connected by wires to the rails, at the end of a section of one mile, and a signal level upon a post at the other end of the section. Thus the current of electricity is continuous from the battery to the signal. When the train enters upon the section the current is taken upon the wheels and axles, and so being withdrawn from the lever it flies up, and a danger signal is set. So long as the train is on the section, the signal remains set and ringing at "danger" until the gate is dropped. One of the great advantages of the Union system is the fact that a broken rail would break the circuit and at once show the danger. A piece of iron wire laid across the rails breaks the circuit, and the warning is given at the signal. Only a day or two since a stray goat dragged a small iron chain across the Providence road nearly half a mile above the Forest Hill crossing, and while the chain was passing over the rails the circuit was cut, the danger-bell rung, and the danger signal was set at the station.—*Boston Advertiser.*

APPLICATION OF ELECTRICAL POWER TO AGRICULTURE.—A short time since, an experiment was tried by M. Menier, in Nes Park, at Noyelles, on the banks of the Marne, near Paris. A part of the water-power which is used for the workshop operates eight Gramme machines, producing an electric current for the Serrin lamps or Jablochkoff candles. The current from two of these machines was sent into the park a distance of 2,275 feet, where two other machines had been arranged on a truck, and connected with a plow by a rope. A number of furrows were then traced with this single apparatus, and the work thus performed was found to be equal to that of four oxen. The experiment was so successful that M. Menier intends devoting a water-power of 30 horses to agricultural work by means of electric currents. Water pipes will be used for placing the insulated copper wires; and M. Menier expects to be able to conduct his power to a distance of about three miles from his mill in every direction, and by this means to perform various agricultural operations.

NICKEL BRONZE.—At the Exhibition of Applied Sciences, now open in Paris, one of the most brilliant exhibits there is made by the company which owns M. Garnier's patents for the preparation of nickel bronze (white bronze.) This remarkable alloy, as manipulated according to M. Garnier's processes, is found to be as capable of application in the art as copper itself. The articles exhibited, which comprise cast, drawn, hammered and engraved goods, have been prepared with the appliances used in the working of copper, and not by one house, but by several firms. The alloy does not rust, takes a brilliant polish, and is not dearer than plated copper, while its substance is, of course, uniform throughout its thickness. For builder's fittings, harness, chains, arms, scientific instruments, clocks, art metal work, etc., the new alloy seems to be of particular value.

PHOTOGRAPHS ON SILK.—One of the silk-manufacturing firms of Lyons is introducing the production of photographic impressions on stuffs. They sent to a recent meeting of the Photographic Society several pieces of silk with a variety of photographic pictures printed thereon, including, among others, a number of large medallions representing pictures of the old masters. The length of the specimens thus exhibited is stated as being no less than 131 feet.

SCIENTIFIC PROGRESS.

Iron and Steel in the Arts.

The earliest mention of iron is found in the Book of Genesis, Chap. iv., 22, where we are told that Tubal Cain was "an instructor of every artificer in brass (or bronze) and iron." The Hebrew word is *barzel*, from a root signifying hardness and strength. We read also of the iron bedstead of Og, King of Bashan, and of Sisera's 900 chariots of iron, 1,300 years before our era. In the time of Agamemnon iron was not in general use. No implements or weapons of this metal have been found in the remains of Mycenæ or of Troy. A large iron plate, however, has been discovered in one of the Egyptian pyramids. In the time of Homer iron was a rare and costly commodity, more highly prized than gold. The poet never mentions it as the material of armor or weapons, which were entirely of bronze, but in two passages of the Iliad iron axes are mentioned as valuable prizes in the athletic games.

Iron was not employed for weapons by the Romans before the time of Hannibal in the second Punic war, but once adopted, the practical genius of the Roman people perceived its advantages, and entered upon its manufacture with avidity. It is not probable that either the Greeks or Asiatics knew the process of extracting iron from the ore. Both iron and steel are found occasionally in a native condition, principally of meteoric origin. Hence it is supposed originated the Greek name for iron, from the same root as *sidus*, the Latin for the starry heavens. The Romans in Britian practiced the art of extracting the metal from the ore on a large scale. Their works were principally carried on in what is now the Forest of Dean in Gloucestershire, and that of Anderida in Sussex, in both of which enormous quantities of scoriæ and cinders have been found. With imperfect methods they were unable to fuse the ore so as to produce cast-iron, and it is probable that the metal was refined by several processes before it was finally adopted for use. The mines had been previously worked, for Cæsar on his arrival found the Britons in possession of iron, though it was employed more for ornament than use.

This imperfect method continued down to the sixteenth century, when the introduction of the blast furnace led to the production of cast-iron, the manufacture of which was for a long time principally supplied from the scoriæ and cinder heaps left by the Romans.

Once adopted, the superiority of iron over every other metal for tools and implements led to the supersession of all other materials for that purpose, and the use of iron entered upon a progressive career, which has extended with the advance of society in an ever-increasing ratio. One of the first purposes to which iron was applied was that of weapons and armor, the manufacture of which attained in the Middle Ages a very high degree of excellence; the hauberks of chain mail of the most intricate and delicate patterns, the chased and inlaid suits of armor, constantly changing its form, exercised the ingenuity of the armorers, and exhibit in the remains left to us a large amount of ingenuity and artistic skill. Offensive weapons were equally elaborated. The Toledo rapier and the Damascus scimitar had a world-wide reputation, and even in England the Sheffield *thwittle* in the time of Chaucer had become famous for its quality. Iron work at this period was of the most elaborate description. The locks and keys, the hinges and bolts, the smith's work in gates and screens, exceed in beauty anything of the kind which has since been produced. Many specimens remain both in England and on the Continent, among which may be mentioned the iron-work in the church at St. Gudule at Brussels, the well cover by Quentin Mastys at Antwerp, and, though of a much later date, the beautiful park gates at Hampton Court. The introduction of cast-iron into general use in the seventeenth century effected a considerable change in the application of the metal. Its cheapness led to its extended use in the household economy of daily life; fire grates, stoves, pots and pans, gates, palisades, pipes, etc. This was no doubt in many respects a great advantage, but it had a very injurious effect on the art of the smith, superseding skill and ingenuity by the deadening process of routine in cast work, and substituting cheapness for excellence.

OPTICAL TELEGRAPHY.—The French Minister of War has published a regulation for organizing optical telegraphy in time of peace. The several places on the French frontier are to be connected by posts; apparatus are to be maneuvered by persons trained, who will keep records of communications sent or received. This new service is to be placed under the supervision of the Director of Aerial Communications, who already has command of the balloonists and the colombophiles for carrier pigeons.

The Influence of Silicon on Steel.

An interesting experiment, which shows the effect of silicon in preventing the reduction of phosphorous in acid in the cinder of an open-hearth furnace, is given by M. A. Pourcel, of Terrenoire. A three ton charge, containing 250% of carbon and 0.50% of phosphorus was melted in an open-hearth furnace. As soon as the charge was thoroughly melted, the slag which covered the metal was removed, and the surface of the bath laid bare. The gas was then shut off, and the hot air alone allowed to pass through the furnace. At the end of 15 minutes a black slag had formed on the surface of the bath, and during its formation jets of carbonic oxide gas were constantly rising from the metal. This fact should be noticed. Samples of metal and slag were then taken, and the gas again let on to reheat the bath. The phosphorus was estimated in the metal and slag, and the percentage in the former was found constant, viz., 50%, the slag showing no traces of this element. When the bath had been reheated the slag was again removed, the gas shut off, and a second refining effected, as before, but, instead of allowing carbonic oxide to form, an addition was made of a certain quantity of silicide of iron manganese, containing 20% manganese and 10% silicon, which completely prevented the disengagement of carbonic oxide gas. After a quarter of an hour the jets of carbonic oxide again appeared, and a sample of the metal was taken before the gas was turned on, and the slag formed during the passage of the air only was removed. The metal now yielded, on analysis, only 0.35% of phosphorous, and a very appreciable amount was found in the slag, although it was not estimated quantitively. The experiment was repeated, but instead of taking samples immediately on the reappearance of the jets of carbonic oxide after the action of the silicide, and instead of clearing away the slag formed during this period, which slag contained the phosphorous that had been scorified, samples were not taken until 15 minutes after the gas was turned on and boiling of the bath had recommenced. It was now found that the phosphorus had disappeared entirely from the slag, and had been reabsorbed by the metal, which yielded, on analysis, its original content, viz., 0.50%. Thus, under the oxidizing action of a current of hot air, phosphide of iron is scorified, when the reducing action of carbonic oxide is obviated by the addition of a metallic silicide to the bath. By making three successive calcinations, each of from 10 to 20 minutes' duration, and under the above-mentioned conditions, M. Pourcel succeeded in reducing the phosphorus from 0.5% to 0.24%.

NEW SPECIES OF FISH.—At a recent meeting of the Christiana Society of Sciences, Robert Collett stated that the deep-water fishes collected during the last Arctic expedition amounted to 33 species, and proved to be of great interest to science, as the fish had, with a few exceptions, been taken from depths from which no Arctic fishes had previously been obtained. The apparatus employed was the so-called trawl-net, constructed on the same principle as that employed by the English fishermen on Doggersbank. Fish were taken up with that apparatus from depths of 1,400 and 1,500 fathoms. Five species proves to be entirely new to science, and it was necessary to classify one of them under a new genus. This was caught at a depth of 1,200 fathoms, and was about one foot long. While alive, it was beautifully rose-colored all over, but of so soft and gelatinous a substance that it was half transparent, and the heart could be seen performing its functions; and a large portion of the brain, the entrails and the whole backbone were visible through the skin. The abdominal fins were transformed into two long split threads, which gave the fish a very peculiar appearance. It was named *Rhodichtys regina*, and belongs to a group of the genuine deep-water fishes which is chiefly limited to the tropic seas.

A MAMMOTH.—A short time ago, says the Marysville *Appeal*, parties employed on levee work about one mile above Yuba City, and near the west bank of the Feather river, discovered portions of the remains of some huge animal, supposed by the laborers to be the bones of another mastodon. Parties subsequently examining the same conclude the fragments of bones exhumed were once those of an elephant. The bones were found imbedded in hard-pan, and about three feet below the soil removed. The animal was imbedded in a standing position. The parts exhumed includes two large teeth, weighing 4½ pounds each; the upper joint of one of the hind legs, measuring four feet six inches; a portion of the skull and a socket of a limb joint. The formation of the teeth classify the animal among the elephant class. It is expected that the entire frame will be exhumed, but considerably broken.

ORIGIN OF PETROLEUM.—One of the latest hypotheses of the origin of petroleum is that advanced by M. Mendelejeff. Starting with the nebular hypothesis, he regards the interior of the earth as metallic, doubtless composed largely of iron and carbides of iron; through rents made by earthquakes, water gained access to these bodies at a high temperature and under great pressure, and by their mutual chemical action, metallic oxides and saturated hydro-carbons resulted. It is these latter, according to M. Mendelejeff, that carried by watery vapor, have made their way through the overlying rocks.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Nov. 6.		Week Ending Nov. 13.		Week Ending Nov. 20.		Week Ending Nov. 26.	
Alpha	14½	14¼	14	13	13½	11¾	12	9¼
Alta	5½	5¼	5⅝	5	5	4	4.55	3¾
Andes	1.30	1.10	1.15	1.10	1.15	1	1.10	1
Alps	....	....	....	....	....	....	....	....
Argenta	1	90c	1	90c	1	90c	95c	80c
Atlantic	....	....	....	....	....	....	15c	....
Aurora Tunnel	....	....	....	....	....	....	15c	....
Baltimore Con	....	....	....	....	....	....	....	....
Belcher	4½	3.70	4	3.85	3.95	3.05	3.20	2¾
Belmont	90c	75c	1.05	75c	1	90c	1	90c
Best & Belcher	21⅞	13½	21⅜	19⅝	20	17⅞	18⅞	16¼
Bullion	7	6⅞	6⅞	6	6½	5¼	5¼	4½
Bechtel	1.60	1.35	1.95	1½	1.90	1½	1½	1½
Belle Isle	4.85	3.95	6	4.10	4.40	3½	3.30	2
Bodie	14	13¼	14¼	11¾	13¼	12½	12⅝	10¾
Benton	3⅞	3.60	3.65	3½	3.60	3	3.10	2.60
Bulwer	11½	11	11½	11	11	10½	10¼	9⅝
Boyle	....	....	....	....	....	....	....	....
Black Hawk	75c	60c	70c	65c	70c	50c	50c	....
Belvidere	75c	65c	70c	65c	75c	70c	50c	....
Booker	95c	70c	1.30	90c	1.05	95c	85c	75c
Caledonia	2¼	2¼	2.30	1.80	1.95	1½	1½	1¼
California	5½	5¼	5⅝	5¼	5¼	4½	5	4.65
Challenge	3.20	2¼	2.60	2¼	2¾	2¼	2.60	2.20
Chollar	8½	7¼	8⅞	8	7¾	6⅞	8	7
Confidence	11½	10⅛	11½	10¾	11	9⅞	10½	9
Con Imperial	1.10	1	1.05	90c	90c	75c	80c	65c
Con Virginia	5⅞	5⅜	5⅞	5¼	5½	5⅜	5¼	5
Crown Point	4.15	3.90	3.90	3⅞	3.90	3	3.05	2½
Con Washoe	....	....	....	....	....	....	....	....
Champion	20c	15c	20c	15c	40c	15c	30c	25c
Concordia	....	....	....	....	....	....	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	1½	75c	1½	1.05	1½	1.10	1.20	1.10
Eureka Con	27	25¼	26½	25½	26	19¾	17⅝	16¼
Exchequer	5½	4.85	4.90	4.60	4.60	4	4.30	3¾
Endowment	50c	....	90c	55c	90c	75c	80c	60c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	2.55	2	2¼	2	2¼	2	1.95	1¾
Gila	35c	30c	50c	35c	40c	30c	40c	30c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	12	....	13	12¼	13	12¼	....	....
Goodshaw	35c	30c	50c	35c	40c	35c	35c	25c
Gould & Curry	11½	10	11¾	10¼	10½	9¼	9⅝	8
Hale & Norcross	18⅞	14¾	20¾	17⅞	18	13¼	14¼	13
Hillside	1.70	1.45	1¾	1½	1¾	1.70	1.40	80c
Highbridge	....	....	....	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	10c	....	15c	10c	20c	10c	20c	....
Indepeudence	1.35	....	1½	1¼	1.35	90c	80c	75c
Julia	3⅞	3.30	3½	3.15	3.15	2½	2.35	1.80
Justice	3	2.80	2.95	2.60	2⅞	2.40	2½	2
Jackson	4	....	4½	4	4	3½	....	....
Joe Scates	....	....	....	....	....	....	....	....
K K Con	3	....	3½	3	3½	....	4	....
Kentuck	4¼	4	4.10	4	3.90	....	3⅞	3½
Kossuth	15c	....	25c	....	20c	....	20c	15c
Keystone	....	....	....	....	3.65	3.60	3½	....
Lady Bryan	70c	60c	55c	50c	50c	25c	40c	35c
Lady Wash	1.15	1.05	1.10	1	1.05	90c	90c	75c
Leopard	65c	45c	50c	....	45c	25c	25c	20c
Leviathan	50c	....	60c	50c	50c	40c	40c	25c
Leeds	60c	50c	75c	60c	50c	....	50c	40c
Lee	....	....	....	....	....	....	....	....
May Belle	35c	25c	35c	30c	35c	25c	25c	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	2½	....	2.60	2½	2.60	2½	2½	2.10
Martin White	1.65	1½	1½	1¼	1¼	1.20	1¼	1.10
McClinton	40c	....	70c	40c	75c	60c	50c	40c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	37⅞	33¾	34½	30¼	33	26	29	23¼
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	5	....
North Con Virginia	....	....	....	....	....	....	10½	10
New York	40c	35c	35c	30c	30c	20c	50c	20c
Northern Belle	5½	5¼	6	5½	6½	6	6⅞	6½
New Coso	....	....	....	....	....	....	....	....
Navajo	60c	50c	75c	65c	60c	45c	50c	35c
Occidental	2.45	2¼	2.30	2	2.15	2	1½	1
Ophir	33⅞	31¼	32	30¾	31½	26½	30	26
Oriental	40c	25c	20c	6c	25c	10c	15c	5c
Overman	9½	9	9¼	8¼	8⅝	8	8¼	6⅞
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	3⅞	3½	....	....	....	....
Phil Sheridan	50c	35c	35c	30c	35c	30c	25c	20c
Potosi	6¼	5½	5⅞	5¼	5⅞	4½	4.90	4¼
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	1½	1.40	1½	1¼	1.40	1.20	1.10	1
Richer	....	....	20c	....	....	....	....	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	17	14⅞	16⅞	15⅞	15	12¼	11⅞	9⅞
Seg Belcher	20	....	....	....	15	13	15	12
Sierra Nevada	59	50¼	57	61¾	53	41½	45	37½
Silver Hill	1.30	1.20	1½	95c	1.60	65c	1½	1¼
Silver King	7	6⅞	6⅞	6¼	6	5½	....	....
Silver Prize	....	....	....	....	....	....	....	....
Succor	35c	15c	30c	25c	30c	....	....	....
Summit	1.85	1½	1.65	1½	1.70	1½	1.20	90c
Scorpion	5	3.90	4⅞	4.40	4½	3.80	3.85	2½
Solid Silver	50c	5c	30c	25c	30c	....	....	....
South Bodie	15c	....	20c	....	25c	20c	30c	20c
South Standard	....	....	....	....	....	....	15c	....
Star	40c	....	40c	....	35c	30c	35c	25c
St. Louis	....	....	....	....	....	....	....	....
Syndicate	6¼	6	6	5	5⅞	3.90	3.10	2.90
Tioga Con	3½	3½	3.40	2.70	3	2⅞	2½	2
Tiptop	1.40	1.30	1.65	1.35	1.95	1½	1.60	1½
Trojan	15c	....	15c	10c	10c	....	10c	....
Union Con	91½	81½	83	62¼	66¼	52½	60	43⅞
Utah	22	20	20⅞	18⅞	18¼	16	17⅞	14⅞
Vermont Con	....	....	....	....	....	....	....	....
Ward	2½	2⅞	2.40	2.10	2.10	1¼	1.90	1.35
Wells-Fargo	10c	....	10c	5c	10c	5c	5c	....
Woodville	35c	....	25c	....	30c	25c	25c	20c
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	17	15⅞	16½	15	16½	14¾	15⅞	13

Sales at S. F. Stock Exchange.

Friday A. M., Nov. 21.
70 Alpha ... 11¾@12
30 Alta ... 4.55
305 Andes ... 1.05@1.10
200 Benton ... 3.10
315 Bullion ... 5½
60 Belcher ... 3.20
190 Best & Belcher ... 18¼@18
75 California ... 5@4.90
70 Con Virginia ... 5¼
50 Confidence ... 10½@10¼
1215 Con Imperial ... 80c
125 Crown Point ... 3@3.05
330 Chollar ... 7¼@7½
610 C Dorado ... 2@2.10
140 Challenge ... 2.60@2½
175 Caledonia ... 1.45@1½
90 Exchequer ... 4.10@4.20
400 Flowery ... 40@35c
195 Gould & Curry ... 9⅞@9⅝
830 Golden Gate ... 2.40@2.30
190 Hale & Nor ... 13½@13⅞
70 Julia ... 2.35
180 Justice ... 2¼
225 Keystone ... 3½
10 Kentuck ... 3½
250 Kossuth ... 20@15c
100 Leviathan ... 40c
1430 Lady Wash ... 90@85c
220 Lady Bryan ... 35@40c
200 Mt View ... 5@4⅞
425 Mexican ... 28½@28
3250 Mackey ... 15c
100 North Con Vir ... 10
1080 New York ... 20c
220 N Bonanza ... 1.10@1
220 Ophir ... 29½@29
90 Overman ... 8½@8
50 Occidental ... 1
550 Phil Sheridan ... 25c
210 Potosi ... 4.70@4⅞
900 Savage ... 11¼@11
5 Seg Belcher ... 15
1010 Sierra Nevada ... 45@43
510 Silver Hill ... 1.40@1½
420 Scorpion ... 3.80@3⅞
100 Solid Silver ... 30c
950 Trojan ... 10c
1100 Union Con ... 59@57½
205 Utah ... 15½@15⅞
100 Wells Fargo ... 5c
570 Ward ... 1.90
300 Woodville ... 25c
310 Yellow Jacket ... 15½@15

AFTERNOON SESSION.
280 Argenta ... 90c
50 Albion ... 15c
100 Aurora T ... 15c
2100 Adenda ... 1.05
1400 Atlas ... 35@40c
720 Belmont ... 1
615 Belle Isle ... 3.30@3¼
315 Bechtel ... 1⅞@1.60
35 Bulwer ... 10¼
50 Black Hawk ... 50c
200 Booker ... 85@80c
300 Boston ... 1½@1.65
35 C Pacific ... 6⅞@6¼
300 Champion ... 30c
250 Caledonia (B H) ... 3½@3¼
1000 Day ... 1.15@1.20
300 Dudley ... 75@70c
80 Eureka Con ... 17¼@17⅝
300 Endowment ... 80@75c
110 Grand Prize ... 1.95
2935 Gila ... 40@35c
50 Goodshaw ... 35c
750 Hillside ... 1.40@1.30
460 Independence ... 80@75c
90 Jupiter ... 1¼
235 Leopard ... 25c
260 Manhattan ... 2½
100 Metallic ... 95c
350 Mt Diablo ... 12
500 McClinton ... 50c
650 May Belle ... 25c
240 Mono ... 5½
10 Mammoth ... 6½
350 Martin White ... 1¼
350 Navajo ... 50c
50 Northern Belle ... 6⅞
475 N Belle Is ... 35@40c
150 N Noonday ... 3½
50 Noonday ... 4.65
600 Oriental ... 15c
50 Oro ... 20c
125 Paradise ... 90c@1
100 Queen Bee ... 40c
100 Ray'd & Ely ... 1
200 Real del Monte ... 4½@4
200 Star ... 35c
660 Syndicate ... 3@3.05
20 Summit ... 1.20
75 S Standard ... 15c
400 S Bodie ... 20c
590 S Bulwer ... 55@60c
1000 Santa Mina ... 90@95c
810 Tioga Con ... 2¼@2.10
200 Tiptop ... 1½
30 University ... 15c
675 Wales ... 3

Saturday A. M., Nov. 22.
330 Alpha ... 11¾@11
180 Alta ... 4¾@4.30
140 Andes ... 1.05
255 Argenta ... 95@80c
1395 Addenda ... 1@1.05
2000 Atlantic ... 15c
105 Best & Belcher ... 18⅞@18½
180 Belcher ... 3.20@3.15
210 Bullion ... 5⅞@5½
50 Benton ... 3.05
90 Belmont ... 1
275 Bulwer ... 10
1150 Belle Isle ... 3@2⅞
20 Boston ... 1.65
50 Booker ... 85c
540 Bechtel ... 1.60@1.65
355 Bodie ... 12@11½
350 Belvidere ... 50c
100 Champion ... 30c
610 Chollar ... 7⅞
700 Con Virginia ... 5¼
195 California ... 4.95@4.90
130 Crown Point ... 3@3.05
800 Con Imperial ... 80@75c
65 Challenge ... 2½
130 Caledonia ... 1¼@1.40
210 C Pacific ... 6¼@6
20 Dudley ... 60c
650 Day ... 1.15@1.20
100 D Standard ... 30c
225 Exchequer ... 4.15@4.30
110 Eureka Cou ... 17⅝
200 Endowment ... 75c
100 Flowery ... 35c
220 Could & Curry ... 9⅝
1085 Gila ... 35@30c
150 Coodshaw ... 30c
60 Grand Prize ... 1.90
90 H & Norcross ... 13¾@14
1900 Hillside ... 1.05@1.20
120 Justice ... 2.40@2½
205 Jupiter ... 1¼@1.10
180 Julia ... 2¼
60 Kentuck ... 3½
80 Lady Wash ... 85c
100 Lady Bryan ... 35@40c
200 Leeds ... 40c
280 M White ... 1.20
770 Mackey ... 15c
350 Mount View ... 4@3.60
1035 Mexican ... 28½@29
625 Metallic ... 95c
125 Mt Diablo ... 12
200 McClinton ... 45c
320 May Belle ... 25c
110 Mono ... 5
10 Mammoth ... 6½
5 Navajo ... 35c
500 New York ... 50c
150 Northern Belle ... 6½
700 N Belle Is ... 35c
505 N Bonanza ... 1
200 N Noonday ... 3½
150 Noonday ... 4½@4.40
320 Ophir ... 30@29½
10 Overman ... 8¼
100 Oriental ... 10c
540 Paradise ... 95c@1.05
150 Raymond & Ely ... 1.05
105 Sierra Nevada ... 45
10 Seg Belcher ... 15
385 Silver Hill ... 1.40@1½
210 Scorpion ... 3.70@3.85
585 Savage ... 11@11⅞
670 Syndicate ... 3@2.90
50 S Bodie ... 20c
600 S Bulwer ... 50c
300 Tiptop ... 1½
200 Tioga ... 2
135 Utah ... 17⅞@17½
635 Union Con ... 60@58½
280 Ward ... 1.85@1.90
1000 Wells-Fargo ... 5c
50 Woodville ... 20c
170 Wales ... 3¼
200 W Pacific ... 25c
220 Yellow Jacket ... 15@15⅞

Monday A. M., Nov. 24.
150 Alta ... 4
20 Andes ... 1.05
1000 Atlantic ... 15c
10 Alpha ... 10
325 Belcher ... 3
560 Benton ... 2⅞@2.65
695 Bullion ... 5¼@5
405 Best & Belcher ... 18@18½
385 Crown Point ... 2.65@2.55
195 Confidence ... 10@10¼
300 C Dorado ... 1.90@2
325 Caledonia ... 1.40@1.30
180 Challenge ... 2½
1895 Chollar ... 7⅞@8
165 California ... 4.85@4.90
290 Con Virginia ... 5½
110 Exchequer ... 4@4.10
50 Flowery ... 35@40c
400 Fairfax ... 80c
320 Could & Curry ... 9@8⅞
850 Colden Gate ... 2.35@2.40
845 Hale & Nor ... 14@13⅞
110 Justice ... 2.40@2⅜
250 Julia ... 2.20
170 Kentuck ... 3⅞
2100 Kossuth ... 15c
50 Leviathan ... 30c
200 Lady Bryan ... 35c
260 Mt View ... 3½@3.40
305 Mexican ... 26@26¼
990 Mackey ... 15c
650 New York ... 50@45c
1270 N Bonanza ... 80c@1
750 North Carson ... 10c
135 Ophir ... 28½
305 Overman ... 8
745 Potosi ... 4.90@4⅞
100 Phil Sheridan ... 20c
770 Savage ... 10½@10
450 Silver Hill ... 1.35@1.40
470 Scorpion ... 3.40@3.30
595 Sierra Nevada ... 43@43½
5 Seg Belcher ... 15
500 Trojan ... 10c
220 Union Con ... 56
120 Utah ... 17½@17¼
950 Wells-Fargo ... 5c
200 Woodville ... 25c
1090 Ward ... 1.80@1.85

AFTERNOON SESSION.
50 Argenta ... 95c
1745 Adenda ... 1.05
100 Belmont ... 1
500 Belle Isle ... 2.60@2½
490 Bodie ... 12½@12⅞
310 Bechtel ... 1.60
340 Belvidere ... 50c
200 Black Hawk ... 50c
200 Booker ... 80@75c
280 Boston ... 1.65@1½
100 Caledonia (B H) ... 3½
250 Champion ... 30c
60 C Pacific ... 5⅞@6
50 Dudley ... 70c
200 D Standard ... 30c
1005 Day ... 1.10@1.20
235 Eureka Con ... 17
200 Grand Prize ... 1.80
200 Goodshaw ... 25@30c
1530 Gila ... 40@35c
100 Hussey ... 20c
880 Hillside ... 1½@1
65 Jupiter ... 1½@1
325 Leeds ... 45@50c
450 Mono ... 5
50 May Belle ... 25c
40 M White ... 1¼@1.20
140 Mammoth ... 6½
105 McClinton ... 50c
150 Mt Diablo ... 11⅞
105 Manhattan ... 2.40
95 Northern Belle ... 6⅞@6½
550 Navajo ... 45c
700 N Belle Is ... 35c
90 Noonday ... 4¼
100 N Noonday ... 3@3¼
100 Queen Bee ... 35c
100 Real del Monte ... 4⅞
475 Raymond & E ... 1.05@1
1450 S Bodie ... 20@25c
765 S Bulwer ... 50@55c
70 Summit ... 1.10@1.20
625 Syndicate ... 3.10@3
100 Star ... 35c
750 Santa Mina ... 1@1.05
175 Tioga Con ... 2.20
605 Tiptop ... 1.55@1.60
380 Wales ... 3¼

Tuesday A. M., Nov. 25.
380 Alta ... 3¾@3.60
420 Alpha ... 10@10¼
1000 Atlantic ... 15c
835 Andes ... 1.05@1.10
180 Belcher ... 2⅞
260 Benton ... 2⅞@2.70
185 Best & Belcher ... 17⅞@17
690 Bullion ... 5@5½
720 Con Imperial ... 70@75c
35 Confidence ... 9¼
250 Crown Point ... 2.65@2½
165 Con Virginia ... 5⅜@5
1600 Chollar ... 7½@7¼
450 California ... 4.80@4.95
100 Challenge ... 2¼
95 Caledonia ... 1.30@1¼
200 Con Dorado ... 1.80
100 Dardanelles ... 75c
325 Exchequer ... 4@3⅞
350 Flowery ... 35@30c
700 Golden Gate ... 2.35
215 Gould & Curry ... 8@8¼
1085 H & Norcross ... 14¼@13⅞
150 Justice ... 2
140 Julia ... 2@1.90
200 Kossuth ... 15c
100 Leviathan ... 25c
150 Lady Wash ... 70c
315 L Bryan ... 35c
700 Mackey ... 15@10c
635 Mt View ... 3.10@2½
1515 Mexican ... 24½@23½
500 N Bonanza ... 75c
455 New York ... 40@45c
100 Occidental ... 1
1085 Ophir ... 27@26¼
130 Overman ... 7@7⅛
670 Potosi ... 4⅞@4.65
10 Seg Belcher ... 12
700 Savage ... 10@9⅞
1315 Sierra Nevada ... 39@37½
875 Silver Hill ... 1.35@1.40
870 Scorpion ... 3@2½
120 Utah ... 15¼
955 Union Con ... 48@46½
100 Woodville ... 20c
1950 Wells-Fargo ... 5c
2330 Ward ... 1½
910 Yellow Jacket ... 14½@14⅞

AFTERNOON SESSION.
1300 Argenta ... 90c
1350 Albion ... 20@15c
1775 Addenda ... 85c@1
100 Belmont ... 90c
590 Belle Isle ... 2.05@2
1050 Bechtel ... 1.55@1½
545 Bodie ... 10½@10¼
50 Bulwer ... 9⅞
200 Belvidere ... 50c
250 Black Hawk ... 50c
50 Booker ... 75c
360 Boston ... 1½
600 Champion ... 25@30c
25 C Pacific ... 6
1250 Day ... 1.10
195 Eureka Con ... 16¼@16½
700 Endowment ... 60c
80 Grand Prize ... 1⅞
1750 Gila ... 40c
400 Goodshaw ... 25c
100 Giant & O A ... 5½
150 Hillside ... 80c
225 Jupiter ... 1¼@1½
50 K K Con ... 4
200 Leopard ... 20c
300 Leeds ... 40c
500 Metallic ... 65@70c
100 Manhattan ... 2.10
225 McClinton ... 50@40c
125 Mt Diablo ... 10⅞
200 Martin White ... 1.10
850 Mono ... 4½@4
250 Mammoth ... 6½@6
400 Navajo ... 40c
320 Northern Belle ... 6½
700 N Belle Is ... 35c
375 Noonday ... 4@4¼
180 N Noonday ... 3
50 Oriental ... 5c
250 Oro ... 20c
565 Paradise ... 1@1.10
550 Queen Beo ... 30c
140 Raymond & Ely ... 1.10
200 Real del Monte ... 4¼@4
200 Summit ... 90c
195 Syndicate ... 3.10@3
1480 S Bulwer ... 40@50c
1200 S Bodie ... 30@25c
200 Star ... 25c
410 Tioga ... 2¼
150 Tiptop ... 1.60
300 University ... 10c
350 Wales ... 3¼
200 W Pacific ... 50c

SALES OF LAST WEEK AND THIS COMPARED

Thursd'y A.M., Nov. 20.
240 Alpha ... 12¾@12½
125 Alta ... 4.70@4.65
420 Andes ... 1.15@1.10
120 B & Belcher ... 19⅞@20
615 Belcher ... 3.15@3.20
190 Bullion ... 6½@6
190 Benton ... 3.40
120 California ... 5¼
35 Con Virginia ... 5¼@5⅜
240 Chollar ... 7½@7⅝
350 Con Imperial ... 80@85c
175 Confidence ... 11@10⅞
710 Caledonia ... 1.70@1½
280 Challenge ... 2.60@2⅞
625 C Dorado ... 2@2.15
355 Exchequer ... 4½@4½
615 Flowery ... 40@45c
285 Gould & Curry ... 10½@10⅞
280 Golden Cate ... 2.40
440 Hale & Nor ... 15⅞@15⅝
110 Justice ... 2.40@2½
350 Julia ... 2.60@2.65
150 Keystone ... 3.60
50 Leviathan ... 40c
500 Lady Bryan ... 35c
1450 Lady Wash ... 95@90c
565 Mexican ... 31@31½
1500 Mackey ... 15c
200 Mt View ... 5@5⅞
1100 New York ... 20@25c
420 N Bonanza ... 1.15@1.10
375 Ophir ... 30½@31½
45 Overman ... 8½@8¼
100 Phil Sherldan ... 30c
515 Savage ... 13½@13¼
550 Sierra Nevada ... 50@48½
100 Silver Hill ... 1½@1.40
10 Seg Belcher ... 15
900 Scorpion ... 4@3.90
250 Trojan ... 10c
190 Utah ... 17¾@17½
645 Union ... 65@66½
800 Wells-Fargo ... 5c
360 Ward ... 2
50 Woodvillo ... 30c
260 Yellow Jacket ... 15½@16

AFTERNOON SESSION.
210 Argenta ... 95@90c
615 Addenda ... 75@80c
1200 Atlas ... 30c
200 Boston ... 1.70@1.65
100 Black Hawk ... 50c
200 Booker ... 90@80c
175 Belvidere ... 60c
425 Bodie ... 12@12½
395 Bechtel ... 1⅞@1.80
700 Belmont ... 1@1.05
210 Belle Isle ... 3.60@3⅞
200 Champion ... 30c
25 C Pacific ... 6⅞
100 Defiance ... 40c
200 D Standard ... 30c
300 Dudley ... 75c
730 Day ... 1.20
600 Endowment ... 75c
20 Eureka Con ... 18
50 Goodshaw ... 35c
300 Grand Prize ... 2@1.90
1950 Hillside ... 1.60@1½
350 Independence ... 80c
160 Jupiter ... 1½
340 Mammoth ... 6½
170 Mt Diablo ... 12
330 Mono ... 5⅞@5⅝
200 Martin White ... 1¼@1.20
600 McClinton ... 70@65c
1170 Metallic ... 1@85c
175 Northern Belle ... 6⅞@5⅞
800 N Belle Is ... 35@40c
330 Noonday ... 4⅞@4½
100 N Noonday ... 3½
50 Navajo ... 50c
100 Orient ... 20c
1000 Oriental ... 15@20c
100 Paradise ... 95c
100 Queen Bee ... 40c
300 Real del Monte ... 5
500 Richer ... 20c
80 Raymond & Ely ... 1
400 Rustler ... 10c
1570 S Bulwer ... 65@60c
150 Star ... 35c
800 Sta Mina ... 85c
50 Silver King ... 5½
195 Summit ... 1½
220 Syndicate ... 3½
125 Tioga Con ... 2¼
830 Tiptop ... 1½
400 University ... 10c
820 Wales ... 3¼

W'ed'sday A.M., Nov. 26.
80 Alpha ... 9¼@9½
410 Alta ... 3½@3.60
930 Andes ... 1
550 Atlantic ... 15c
220 Best & Belcher ... 16½@16¼
580 Belcher ... 2.90@2.85
500 Bullion ... 5@4⅞
485 Benton ... 2.60@2.65
450 California ... 4.80@4.65
410 Con Virginia ... 5@5⅛
1180 Con Imperial ... 70@65c
100 Crown Point ... 2.60@2.56
1025 Chollar ... 7@7¼
55 Confidence ... 9@9¼
175 Challenge ... 2.20@2¼
280 Caledonia ... 1¼
1250 Con Dorado ... 2@1.90
150 Dardenelles ... 70c
225 Exchequer ... 3.90@3.95
365 Flowery ... 25c
290 Gould & Curry ... 8@8½
1540 Colden Cate ... 2.30@2
375 Hale & Nor ... 13¼@13
270 Justice ... 2
400 Julia ... 1.90@1.80
10 Kentuck ... 3½
100 Kossuth ... 15c
250 Lady Bryan ... 35c
320 Lady Wash ... 80@75c
645 Mexican ... 23⅞@24
50 Morning Star ... 5
120 Mackey ... 16c
510 Mt View ... 2.30@2½
570 N Bonanza ... 70@75c
50 North Con Vir ... 10¼
510 New York ... 40c
90 Ophir ... 26
100 Overman ... 7@6⅞
120 Occidental ... 1¼
290 Potosi ... 4.40@4¼
100 Phil Sheridan ... 20c
515 Savage ... 9⅞@9⅞
720 Sierra Nevada ... 39@38
10 Seg Belcher ... 14
250 Silver Hill ... 1½
580 Scorpion ... 2.90@2.95
1000 S Utah ... 10c
70 S Potosi ... 10c
500 Trojan ... 10c
95 Utah ... 14⅞@15
440 Union Con ... 43⅞@45½
280 Ward ... 1½@1.35
200 Woodville ... 20c
500 Wells-Fargo ... 5c
215 Yellow Jacket ... 13⅞@13

AFTERNOON SESSION.
800 Addenda ... 85@70c
900 Albion ... 20c
275 Argenta ... 95@90c
1300 Altas ... 30c
200 Belmont ... 85c
510 Bodie ... 10¾@10
350 Belle Isle ... 2½@2.55
100 Bulwer ... 9⅞
260 Bechtel ... 1½@1.55
445 Booker ... 75@80c
50 Champion ... 25c
50 C Pacific ... 6
1300 Day ... 1@1.05
700 Endowment ... 70c
560 Grand Prize ... 1⅞
140 Gila ... 40c
200 Goodshaw ... 15c
1250 Hillside ... 1@1.10
25 Independence ... 85c
270 Jupiter ... 1½@1.40
100 K K Con ... 4
200 Leeds ... 45c
100 Manhattan ... 2.10
470 Martin White ... 1
175 Metallic ... 75@80c
90 Mammoth ... 6
325 Mono ... 4.60@4½
125 McClinton ... 40c
150 Mt Diablo ... 10
1490 N Belle Is ... 35c
130 Noonday ... 4¼
130 Northern Belle ... 6⅞@6½
210 Navajo ... 40c
300 Paradise ... 1.20
1000 Queen Bee ... 35c
100 Raymond & E ... 1
450 Star ... 25c
1460 S Bulwer ... 50@40c
270 Syndicate ... 3
750 South Bodie ... 30@35c
340 Summit ... 90@80c
600 Santa Mina ... 1.15
250 Tiptop ... 1.65
260 Tioga Con ... 2¼@2.35
100 University ... 10c
90 Wales ... 3¼
200 W Pacific ... 40c

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Aurora Tunnel & M Co	California	4	10	Nov 13	Dec 15	Jan 3	C V Hubbard	203 Bush st
Argonaut M & M Co	California	2	10	Oct 7	Nov 15	Dec 8	J L Fields	240 Montgomery st
Caledonia S M Co	Nevada	29	50	Nov 10	Dec 16	Jan 6	R Wegener	414 California st
Champion M Co	California	4	20	Oct 15	Nov 20	Dec 9	Jno Crockett	203 Bush st
Defiance G M Co	California	4	30	Nov 12	Dec 17	Jan 6	W H Lent	309 Montgomery st
Dudley M Co	California	6	25	Nov 19	Dec 20	Jan 16	E C Maston	309 Montgomery st
Flowery M Co	Nevada	3	25	Nov 14	Dec 19	Jan 7	W W Stetson	309 Montgomery st
Cen'l Thomas M & M Co	Nevada	5	25	Nov 3	Dec 8	Dec 29	Wm Willis	309 Montgomery st
Grand Prize M Co	Nevada	3	75	Nov 25	Dec30	Jan 20	E M Hall	327 Pine st
Hillside M & M Co	Nevada	1	50	Nov 21	Dec 24	Jan 13	F Frankenthal	330 Pine st
Independence M Co	Nevada	4	25	Nov 15	Dec 18	Jan 8	E M Hall	327 Pine st
Indian Queen M & M Co	Nevada	2	10	Nov 6	Dec 20	Jan 10	A K Durbrow	309 Montgomery st
Julia Con M Co	Nevada	10	1 00	Nov 19	Dec 24	Jan 16	H A Charles	419 California st
Jupiter M Co	California	6	35	Nov 12	Dec 15	Jan 8	E C Masten	309 Montgomery st
K K Con M Co	Nevada	9	2 00	Oct 3	Nov 5	Dec 3	B B Minor	309 Montgomery st
McCrackin Con M Co	Arizona	4	25	Nov 17	Dec 24	Jan 20	A Wenzelburger	216 Sansome st
Mexican G & S M Co	Nevada	9	2 00	Nov 7	Dec 11	Dec 31	C L McCoy	203 Bush st
Murchie G & S M Co	California	2	25	Oct 9	Nov 8	Dec 8	S D Rogers	328 Montgomery st
New York M Co	Nevada	20	30	Oct 22	Nov 24	Dec 16	D L Thomas	203 Bush st
North Bonanza M Co	Nevada	4	25	Nov 21	Dec 26	Jan 15	W W Stetson	309 Montgomery st
Northern Belle Isle M Co	Nevada	1	10	Nov 8	Dec 11	Dec 31	E M Hall	327 Pine st
Occidental Con G M Co	California	3	10	Nov 10	Dec 20	Jan 10	W T Smith	402 Montgomery st
Oriental Con G & S M Co	California	5	25	Nov 8	Dec 10	Dec 27	H C Hinman	411 California st
Potosi M Co	Nevada	2	50	Nov 4	Dec 9	Dec 30	W E Dean	203 Bush st
Rough & Ready Con G M Co	California	1	05	Oct 15	Nov 19	Dec 9	W H Lent	309 Montgomery st
Seg Belcher M Co	Nevada	16	3 00	Oct 31	Dec 5	Dec 26	Geo D Edwards	414 California st
Sierra Nevada S M Co	Nevada	60	2 00	Oct 31	Dec 4	Dec 24	W W Stetson	309 Montgomery st
Silver Hill M Co	Nevada	8	50	Oct 16	Nov 19	Dec 11	W E Dean	203 Bush st
Solid Silver G & S M Co	Nevada	2	25	Oct 6	Nov 10	Dec 8	J J Applegate	320 Sansome st
Utah S M Co	Nevada	27	2 00	Oct 22	Nov 25	Dec 13	G C Pratt	309 Montgomery st
Wells Fargo M Co	Nevada	13	10	Nov 17	Dec 22	Jan 9	D L Thomas	203 Bush st
Yellow Jacket S M Co	Nevada	24	1 00	Oct 13	Nov 18	Dec 18	Mercer Otey	Gold Hill, Nevada

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Hydraulic Grav M Co	California	1	20	Oct 2	Nov 10	Dec 13	James Ireland	216 Sansome st
Butte Hydraulic M Co	California	—	10 00	Oct 31	Dec 2	Dec 22	L L Dennery	220 Sansome st
Cataract & Wide West H M Co	Cal	—	25	Nov 15	Dec 22	Jan 12	Wm B Lake	26½ Kearny st
Chollar M Co	Nevada	—	50	Nov 4	Dec 9	Dec 29	W E Deau	203 Bush st
Diana G & S M Co	Nevada	4	10	Sept 24	Nov 17	Dec 15	J T McCeoghan	318 Pine st
Florida Hill M Co	Idaho	1	10	Oct 31	Dec 5	Dec 30	R Wegener	414 California st
Mayflower G M Co	California	6	10	Oct 9	Nov 12	Dec 9	J Morizio	328 Montgomery st
McClinton M Co	California	4	25	Oct 10	Nov 14	Dec 4	W H Lent	309 Moutgomery st
Meadow Valley M Co	Nevada	15	25	Sept 12	Nov 12	Dec 8	T W Colburn	414 California st
Monte Cristo Con M Co	California	1	10	Oct 3	Nov 17	Dec 15	Butler Burris	309 Montgomery st
Morgan M Co	California	5	30	Nov 13	Dec 23	Jan 15	J J Raphael	533 Kearny st
Northern Light G & S M Co	Cal	6	10	Nov 5	Dec 8	Dec 26	F S Monroe	310 Pine st
Numa M Co	Nevada	2	02	Oct 23	Dec 22	Jan 12	D Wilder	328 Montgomery st
Quinn M Co	California	—	25	Nov 15	Dec 19	Jan 7	T J Blakeney	Palace Hotel
San Xavier M & S Co	Arizona	1	25	Oct 14	Dec 1	Dec 22	F A McCee	32 Merchants' Ex
South Bulwer G M Co	California	5	25	Oct 27	Nov 29	Dec 20	W Stuart	320 Sansome st
Summit G M Co	California	4	30	Nov 17	Dec 22	Jan 12	W H Lent	309 Montgomery st
Telfair M Co	Arizona	1	02	Nov 12	Dec 20	Jan 15	J Peutecost	702 Market st
Wide Awake P & M Co	Arizona	8	03	Oct 11	Nov 11	Dec 11	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Amazon Con M Co	Nevada	John Crockett	203 Bush st	Annual	Nov 25
Butte Creek Hydraulic M Co	California	R L Taylor	310 Pine st	Stockholders	Dec 1
Godfrey Grav M Co	California	J M Buffington	309 California st	Annual	Dec 1
Mexican G & S M Co	California	C L McCoy	203 Bush st	Annual	Dec 2
Mexican M & R E Co	——	C A Morse	217 Sansome st	Annual	Dec 1
Potter M Co	——	C W Crano	10 Leidesdorff st	Annual	Dec 1
Starr King S M Co	Arizona	H P Bush	27 Merchants' Ex	Annual	Dec 5
Swamp Angel G M Co	California	C W Badger	315 California st	Annual	Dec 4

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Belle Isle M Co	Nevada	R H Brown	S F Stock Ex	75	Nov 5
Bodie Con M Co	California	W H Lent	Nevada Block	50	Dec 1
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	2 00	Oct 20
Pioneer M Co	California	J W Pew	310 Pine st	08	Oct 6
Standard Con M Co	California	Wm Willis	309 Montgomery st	50	Oct 13

Pacific Board—Latest Sales.

Tuesday A. M., Nov. 25.
140 Best & Belcher ... 17⅞@17½
180 Bullion ... 5¼@5
100 Belcher ... 2.70@2.65
30 Benton ... 2.65@2⅞
300 Con Imperial ... 75c
100 Chollar ... 8
120 Con Virginia ... 5
110 Crown Point ... 2½@2.55
140 Colorado ... 3½@3⅞
25 Exchequer ... 3.80
1000 Globe ... 25@30c
110 Gould & Curry ... 8½@8½
340 Hale & Nor ... 16½@13⅞
30 Justice ... 2.15
50 L Bryan ... 35c
170 Mexican ... 25½@24
150 Ophir ... 26¼@26⅞
150 Potosi ... 4.65@4.60
240 Savage ... 10@9¼
70 S Nevada ... 40½@37½
70 Scorpion ... 2⅞
200 Silver Hill ... 1.30@1¼
160 Union ... 51@46
10 Yellow Jacket ... 14½

AFTERNOON SESSION.
70 Alta ... 3.30@3½

350 Atlas ... 37½@40c
20 Alpha ... 10
200 Addenda ... 95c
155 Belcher ... 2.70@2.65
20 Bullion ... 5½
70 Best & Belcher ... 17
5 Benton ... 2½
50 Chollar ... 7⅞
50 Con Virginia ... 5
220 Con Imperial ... 70@75c
200 Endowment ... 75c
70 Gould & Curry ... 8@7⅞
80 Hale & Nor ... 13¼@13⅞
100 Julla ... 1⅞
70 Justice ... 2@2.05
60 Mexican ... 24
50 N Bonanza ... 75c
30 Ophir ... 26@26½
20 Overman ... 7⅞
100 Queen Bee ... 35c
70 Silver Hill ... 1.30
100 Savage ... 9@9⅞
130 Sierra Nevada ... 37½@40½
100 S Bodie ... 30c
20 Utah ... 15⅞
70 Yellow Jacket ... 14@14½

California Board—Latest Sales.

Tuesday A. M., Nov. 25.
50 Alpha ... 10½@10¼
40 Alta ... 4
130 Andes ... 1.05
750 Atlas ... 37@40c
200 Ætna ... 3c
20 Belcher ... 2⅞
30 Best & Belcher ... 17⅞@17¼
20 Bullion ... 5½
40 Con Virginia ... 5@5⅛
270 Con Imperial ... 75c
50 Crown Point ... 2.60@2.55
40 Chollar ... 8
120 Challenge ... 2.35
170 Caledonia ... 1.40
110 Exchequer ... 4.20@4½
70 Gould & Curry ... 9
40 Hale & Nor ... 14⅞
125 Justice ... 2.40
30 Mexican ... 25¼
150 N Carson ... 4c
300 N Sierra Nevada ... 8@8c
20 Ophir ... 27½
25 Potosi ... 4.85
30 Savage ... 10⅛
25 Sierra Nevada ... 40½
170 S Bodie ... 20@25c
30 Union ... 51
30 Yellow Jackot ... 14⅞

AFTERNOON SESSION.
150 Alta ... 3½
216 Andes ... 1.05
700 Atlas ... 25@40c
75 Belcher ... 3.10
40 Bullion ... 5
20 Best & Belcher ... 16⅞
1100 Black Hawk ... 35@30c
45 Crown Point ... 2.60
150 Con Imperial ... 70c
80 Chollar ... 7
30 Challenge ... 2
20 Exchequer ... 4
100 Enterprise ... 1½
55 Gould & Curry ... 7½@7⅞
50 Hale & Nor ... 13@12⅞
40 Justice ... 2
20 Mexican ... 23
140 New York ... 40c
40 Savage ... 9@9⅛
20 Sierra Nevada ... 37
40 Scorpion ... 2¼
175 S Bodie ... 32½@30c
30 Union Con ... 42@42½
20 Utah ... 15

Mining Share Market.

Considerable heavy transactions have been one of the marked features of the market this week, attended, however, by low prices. Notwithstanding, the market has been practically dull, although the indications on Wednesday showed a growing demand for outside stocks. Comstock securities have improved, and prices are generally stronger. It is claimed that the Chicago and New York Mining Boards are attracting the choice stocks of the Pacific coast, and that this is the reason why our market exhibits such monotonous features. It is probable that certain stocks will go East, compelled by force of circumstances rendering it impossible or difficult for them to get a foothold here. A few "booms" in that direction will change the joy of the Eastern speculator to sorrow, and cause him to repress his feelings of joy at causes which compel the departure of such stocks from this coast.

There is no fear of good investments leaving San Francisco. The culls alone will be left over which other Stock Boards may wrangle to

their hearts' content. Business which we care to keep cannot be very well worked out. It is, nevertheless, true that the management of a number of California and Nevada mines are going to New York, and it is likewise true that the control of some of our California mines lies in England. But this does not mean very much, we have had the mining fever here often enough, and we certainly do not object to let it go elsewhere.

Ice Making by the Pictet System in Sacramento.

In our issue of May 25th, 1878, we published an illustrated description of the Pictet system of manufacturing artificial ice, or, as it is styled, the "Pictet anhydrous sulphurous oxide process." It is an item of local interest that this process has been put in practical operation on this coast in the ice manufactory of J. L. & D. H. Coles, at Sacramento. These gentlemen secured the right of the Pictet system for Idaho, Oregon, California, Arizona, Nevada and Utah, and to show the value of the system which they desire to introduce to the people of this coast, they erected the works at Sacramento, so that all could judge its merits by its actual accomplishment. They leased a suitable building on K street, and to secure pure and clear water they sunk an artesian well, with copious results. The Pictet apparatus imported from New York is now in successful operation, and, according to reports in the local papers, the public interest in the process is testified by the great numbers of visitors from all parts of the coast, who have heard of the Pictet process and desire to see it at its work. The Sacramento *Bee* gives the following description of the establishment:

The visitor who anticipates seeing a net-work of intricate machinery when he enters the ice manufactory will be disappointed, as its simplicity cannot be excelled. On entering the premises, nothing to attract the attention especially is seen except a covered tank, raised about two feet from the floor, and in the rear of this is a steam engine and boiler-room. In this tank are 12 apartments, separated by partitions which are open at alternate ends. It is filled with brine, 40% strong. Into this brine are lowered 240 oblong cans—which are made slightly flaring in order to admit of the ice being easily drawn therefrom—each of which is three feet long, one foot wide, and six inches in depth, and holds about 80 pounds. By means of an ordinary pump the brine is caused to circulate around these cans, and is made intensely cold by coming in contact with the tanks, which contain the anhydrous sulphurous oxide. This oxide absorbs the latent heat from the brine by its expansion, and then throws it off by being compressed through a condenser and becoming a liquid. This oxide may be worked over from year to year without losing its strength or changing its chemical condition, is perfectly harmless, non-corrosive, and has been pronounced by leading Boards of Underwriters throughout the world an excellent fire extinguisher. The brine is kept constantly at a temperature of 16° to 20° Fahrenheit.

The necessary power is supplied by an ordinary steam engine of ten-horse power, which runs a simple double valve pump which compresses the oxide from a gas to a liquid, by the aid of a stream of condensing water which passes through the tubes of a common condenser.

The boiler is known as the Pond patent, has a hydraulic test of 200 pounds to the square inch and is supplied with perpendicular tubes, hanging into the fire box and connecting at the top with a steam drum.

The ice making machine is what is known as the "Pictet Artificial Ice Machine," and was built by the celebrated New York firm of C. H. De La Mata & Co., a guarantee that it is perfect in every detail. Its capacity is ten tons of ice in every 24 hours, and the excellence of its working is attested in the clear, solid cakes of ice turned out by the process.

Coles Brothers have arranged ice store-rooms with a capacity of nearly 500 tons. They propose soon to begin the delivery of ice throughout the city of Sacramento, and as the claim of the Pictet system is in exceeding cheapness of production they will aim to bring ice within the reach of thousands of consumers who are unable to buy it at present rates. Other points soon to be realized are the erection of a skating rink in San Francisco, the water to be frozen by the Pictet process. As the system has also been already adopted to cooling the air in breweries, cold store-rooms, etc., Messrs. Coles propose to give it a local application to the cooling of deep mines, and it is expected that experiments in this direction will be made at an early day.

DR. COLLYER, the chemist of the Agricultural Department, says Illinois can supply the United States with sugar by raising sorghum, the secret of the crystallization of that plant lying simply in the time to gather the crop.

SPOTTED TAIL'S new mansion, at Rosebud Agency, has been completed, and old "Spot" gave a party a few evenings ago, in honor of the event. Twenty fat dogs were devoured.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

BUTTE BASIN MINE.—*Dispatch*, Nov. 22: The company running the Butte Basin gravel mine are about to be overcome by the immense flow of water into the shaft. Last Saturday night they struck a stream of water so much beyond the capacity of the steam pump in use that the mine was almost filled by the rapid inflow. The company, probably by this time, have another steam pump in operation.

MONTEREHARA.—The miners are now down about 50 ft on the last sinking, making the total depth of the shaft now about 400 ft. The east level is in about 170 ft where the ledge is about three ft wide. The mill is running steadily, and a large amount of good rock is being crushed.

PLYMOUTH ITEMS.—*Ledger*, Nov. 22: At the Empire, or Phœnix, last week the rope at the north shaft broke, when the bucket was about half way up. The bucket fell to the bottom and was knocked all out of shape by the fall. The rope is made of wire, and has been introduced but a little over a month, and in that short time it has broken three times. The mine is being well supplied with timbers, a large quantity being now on hand. Firewood is also coming down the ditch freely. The flume is piled up on both sides with wood, and there is enough in sight to keep the work running till the middle of next summer. The mill is running to its full capacity by water, the late rains having raised the water in the river. Some work has been done by Hayward lately on the Nevada mine. A fine ledge was struck in sinking which prospected well.

CALAVERAS.

ITEMS.—Calaveras *Chronicle*, Nov. 22: Work is progressing swimmingly at the Boston mine, in Buckeye gulch. The tunnel is now in a distance of 63 ft, showing up the ledge very favorably. Specimens of the ore can be seen at Wise's store. Wesson & Co., proprietors of the Cemetery quartz mine, are pushing ahead vigorously. They have a tunnel 100 ft long, run on the ledge the entire distance. The vein averages about three ft in width, the ore visibly carrying free gold.

DURYEA HYDRAULIC.—This gravel is running up to its fullest capacity, 400 inches of water being used against a bank 30 ft in hight, a 10-inch grade and having no rocks of consequence to contend with, permits everything to be carried through the flume without interruption—but two men are required to do the labor.

ROCKY DIAMOND.—Good pay is now being taken out through 700 ft of a tunnel. A 5-stamp battery is constantly employed.

SAFE DEPOSIT.—There are 28 men at work. Excavation for a mill site is going on. A tunnel has been run 376 ft, encountering good pay.

THE CHAMPION.—The work of straightening the shaft in the Champion mine at West Point, is about completed. A new shaft had to be sunk about 100 ft in straightening and repairing the old one, the object being to give it the same inclination from top to bottom. The new hoisting works, which stand at the mouth of the new shaft, are nearly finished.

MARIPOSA.

FERGUSON.—Private Letter: The Ferguson mill, of 10-stamps, has cleaned up from 100 tons of ore, 144 ounces of bullion, worth $2,275, the product of 11½ days milling. This gives $22.75 per ton from the vein which is two ft wide. There is every appearance of this very satisfactory average being continued for some time to come.

THE POOL MINE.—*Gazette:* This mine, located near Hornitos, is about to open out, with a Kendall battery of two rotating stamps, which are said to equal 10 stamps of the ordinary structure. By running a crosscut Mr. Pool has recently struck the true fissure vein of an excellent quality of ore, which had previously been lost.

MONO.

STANDARD.—Bodie *News:* Late reports state that the north drift, 385 level, is now in 478 ft; progress during the week, 14 ft. The ledge is about five ft wide, and looks well. In the north stopes the ledge is from 18 to 20 ft wide of good milling ore. The south drift from the main east crosscut has been advanced since last report 14 ft, and is now in 159 ft. The ledge is four ft wide, of good ore. The south drift from the east crosscut, 300 level incline, has been run since last report 10 ft; total length, 48 ft. The ledge is about three ft wide of rich ore. The south drift, 550 level, has been extended during the past week 22 ft; and is now in 317 ft. The ledge is four ft wide of good ore. The upraise on 300 level, south of incline, is now up 20 ft; progress for the week, 15 ft. The ledge is five ft wide of good ore. The stopes throughout the mine are looking well, and yielding the usual amount of good ore. In the West Standard stopes, 450 level, the ledge is seven ft wide of rich ore. In the stopes, north drift, 550 level, the ledge is from 8 to 10 ft wide of good ore, and in the Golden stopes the ledge is three ft wide of good milling ore.

SUMMIT.—Since last report the incline has been sunk 23 ft, and is now down 142 ft below the 300 level. The ledge in the bottom is about three ft wide. The west crosscut from the south drift, 300 level, has been run during the past week nine ft. Total length, 90 ft. The ground continues hard.

THE ADDENDA STRIKE.—The ledge upon which the Addenda is now sinking a winze from the 460 level gives promise of being the richest ore body ever struck in Bodie district. The winze, down nine feet, shows the ledge to increase in width as depth is gained, the ore continuing of the same high grade as that found in the crosscut. Where the pitch of the ledge, the new shaft will cut the vein at 350 ft, and continuing to increase in size, will be fully 25 ft in width when struck in the new shaft. So far as opened, and taking the character of the ore, assaying from $200 to $1,200—80% silver and 20% gold—of precisely the same appearance as the Con. Virginia rich chloride, certainly give strong grounds for believing that a regular bonanza will be uncovered in the Addenda.

NOONDAY CON.—Bodie *News*, Nov. 23: The south drift on the 200 level of North noonday is in ore 175 ft; vein looking well. The east crosscut, 312 level, is in 206 feet; the last few ft have cut two small stringers of quartz that give good assays. Vein No. 2 south, same level, drift in 135 feet. At this point the vein is in a broken formation, apparently caused by small cross-veins. North on same level and vein, drift in 110 ft; ledge about four ft wide of good milling ore. Vein No. 1, drift south, same level, in 188 ft; strong four-ft vein, carrying high grade ore.

QUEEN BEE.—Work on the shaft during the week has made excellent progress, having reached the 400 level and cut out the station for that level yesterday. Drifting for the ledge will be commenced soon. This drift will strike the ledge found on the 250 level in about 40 ft. It will be remembered that the ore body on the 250 level was good milling ore, running from $40 to $250 per ton, with a 16-ft ledge. The formation of the ground, in every particular, has the same character as the Comstock, carrying the heavy blue clay gouge forming the east and hanging wall. The quartz is bright and solid, assaying about equal parts of gold and silver.

BLACKHAWK.—Progress during the week, 15 ft; total depth, 479 ft. During the week passed through a seam of quartz about four inches wide, assays from which average about $20 in gold. Drifting east and west at bottom of winze, which is 150 ft below the 320 level. In the drift crossed a seam of quartz about 20 inches wide, averaging about the same as the other veins encountered.

CRŒSUS.—Shaft now down 100 ft; progress made during the week, 28 ft. Engaged drifting on the vein, which runs east and west, ranging from one to two ft of vein formation, assays from which run from $2 to $50 per ton.

RED CLOUD.—Shaft down 400 ft. The water has been drained 75 ft in the shaft within the past month. Are now drifting south on the 250 level; drift in 380 ft; ledge is five ft wide of fine milling ore. The upraise on the ledge from this level, 180 ft from the shaft, is up 63 ft; ledge looking well.

BODIE TUNNEL.—Made a progress of 20 feet during the week past, making a total distance of 1,338 ft. At 1,325 ft a vein carrying six inches of good milling quartz was struck, which bears every indication of widening as work is done on it. Air continues good, and the face is in good working ground.

COX, PACIFIC.—Bodie *Chronicle*, Nov. 22: The north drift on 400 level is now in 29 ft from the station. The appearance of the vein matter is rapidly changing. An additional streak of quartz has made its appearance in the west wall. It is one foot thick, of a bluish white quartz, very soft, and of a fair milling grade. The whole face of drift is now in vein matter, with no east wall. The south drift, 400 level, was started this week, and is now in about five ft, the whole face of drift being in vein, and carrying some milling ore. The shaft is now 41 ft below the station, and the vein now being drifted on in the 400 level is making its appearance at the bottom of the shaft. Its westerly dip will soon bring the whole vein into the shaft. An assay taken from this point gave: Gold, $75.33; silver, $3.14. The explorations on the 400 level have proved the Pacific No. 3 vein to be large and of uniform size, carrying considerable milling ore, and promising to be the most profitable one of the four veins passing through the company's claims.

ITEM.—*News*, Nov. 20: John Williams called at our sanctum yesterday with a small sack of rich ore. Several pieces fairly sparkled with gold, running apparently in seams through the rock, while others showed threads of silver woven in fantastic shapes wherever broken. It came from Prospect Hill, about 35 miles south of Bodie.

NEVADA.

ROUND MOUNTAIN MINE.—Nevada City *Transcript:* The Round Mountain drift mine, near this city, continues to look well. The channel is from 60 to 70 ft wide, from four to six ft deep, and the gravel is uniformly rich to an unusual extent. The claim was worked as early as 1854, by some parties who ran a tunnel and breasted out about 100 ft of the gravel, after which they abandoned it, leaving 100 ft in the breasts, for something else that promised to be still better. The present owners, who have eight men employed, have struck the old workings and are now running in towards the hill to get around them. In a few days more everything will be ready to commence breasting for this winter's washing, and with plenty of water, as there is every prospect of being soon, some big clean-ups will be made.

THE MERRIMAC.—The Merrimac comprises 160 acres lying just east of the Round Mountain. It is a prospective enterprise of recent birth, but bids fair to become one of the leading drift mines among the several that are looming up within a rifle shot of Nevada City. It is in the hands of some of the best miners in the county, and they are confident regarding the brightness of its prospects. From the bottom of an 80-ft shaft a drift is being run towards the hill, and has now a length of over 200 ft. For nearly all that distance, gravel somewhat similar to that of Round Mountain is found, but as might be expected, it contains no gold to speak of. The tunnel runs along the bedrock, and the indications are that the breast of it is now on the rim of the pay channel, and will, within a short distance, make an important and satisfactory strike.

ROCKY BAR.—Grass Valley *Union:* Since the connection of the drain drift from the Rocky Bar to the New York Hill mine, important changes are being made at the former mine. An 11-inch pipe has been laid down through which all the water is carried off from the bottom of the Rocky Bar through to Wolf creek. All the machinery from the upper shaft of the Rocky Bar is being removed to the Chavanne shaft, through which in future all the rock will be raised. In addition, the company is preparing to erect a 10-stamp battery near the Chavanne shaft, and when complete they will crush their own quartz. The perfect drainage of the mine having now been secured a considerable saving of expense is obtained by doing away with the hoisting works of the upper shaft, and disposing with all pumping except such as will be necessary for boilers and batteries.

DEADWOOD MINE.—*Transcript*, Nov. 22: About 30 men are now regularly employed at this mine. The incline is down nearly 500 ft, and a new level will soon be opened up. Seven tons per day is being taken from the 320 level. The company will to-day commence crushing on a 150-ton lot of their rock that promises to yield very well.

TRUE BLUE.—*Herald*, Nov. 20: This mine is located on the south fork of Deer creek, about 15 miles northeast of this city, and is owned by Messrs R. E. Robinson, D. Wellington, C. E. Beedle and J. W. Stephens. These parties have been prospecting during the past five or six months by running tunnels and sinking shafts to find what is supposed to be the Red Dog and Chalk Bluff lead, which is thought to extend through to where they are prospecting. The company have been taking out gravel for some time, but yesterday a much richer portion of the channel was reached, and the indications are very favorable for the development of a rich mine.

SPENCEVILLE COPPER MINING.—Grass Valley *Union:* The product of pure cement copper, of the San Francisco mine, at Spenceville, in this county, has now reached 40 tons per month, being an increase of about 10 tons per month over that of last spring. The product will be still further increased when the ore piles now burning have been sufficiently roasted. The different heaps now burning contain 12,000 tons of ore, which are covered by 1,500 ft of sheds. The mine itself has only been worked to a depth of 100 ft, where the ore body is found over 130 ft in width, and cannot be exhausted in years. The shaft has been sunk to a depth of 150 ft, where the evidence is that the vein is equally as strong, but there is no necessity of working it until the 100 level shows signs of exhaustion.

PLACER.

DUTCH FLAT.—*Forum:* Mr. Andrew Larson showed us a few days ago a most encouraging "prospect" in the shape of three gold nuggets taken from his mine near Alta. The specimens were picked from the gravel taken from the tunnel now being run through the claim. From these rich specimens Mr. L. is satisfied that he is very near, if not on the lead of a very rich gold deposit, and we are disposed to think he is about right. The length of the tunnel at present is 915 ft, the gold shown us was taken out near the further end of the tunnel.

A NEW MINE.—An exchange says: A. D. Ballard has just brought in, from the eastern part of Placer county, some very pretty-looking gold quartz from a claim he has there. It lies on the South Fork of the North Fork of the American river, and has a paying ledge three ft wide. Where exposed it gives assays of from $20 to $90, but shows indications of better things ahead. A company in Virginia is interested in this claim, and probably in the spring it will be opened and worked. Wood and water there are plenty, and the claim has been secured.

DRIFT MINES.—*Herald*, Nov. 22: We learn that Breece and Wheeler, at Bath, propose to forego washing this winter and continue drifting. Some time ago they ran a tunnel in through the rim to the channel, with the view of drifting during the dry summer months, when there would be no water for hydraulicing. They found the gravel in the channel so much richer than they anticipated that they have concluded to continue drifting, especially as the work done by this process does not impair the value of their mine for hydraulicing purposes. The gold in the channel is very solid and coarse, and the ground pays thus far about $12 to the carload on an average. One man will get out about two carloads a day, and from this the paying qualities of the mine can be judged. The channel seems to be running back into the ridge, and is undoubtedly many miles in extent. Its width has not yet been ascertained. The breast being carried forward is 60 ft wide, but it does not touch the rim on either side.

SIERRA.

STRUCK PAY.—Downieville *Messenger:* The Extension of 1,001 mining company, above Sierra City, has struck pay in their claim. The point at which pay was found is about 100 rods from the 1,001 corner line. The claim is owned by men employed at the Buttes mine.

BIG STRIKE.—*Exchange:* We were informed during the week that a quartz ledge in Sierra county, about four miles from Pete Yore's residence, has been developed of immense richness. The greatest excitement prevails. The quartz is of a bluish color, and contains not only gold, but silver in great abundance. From information furnished us, should the lead hold out, the mine will not only astonish its lucky owners, but the county and State.

BALD MOUNTAIN.—*Messenger*, Nov. 22: The Bald Mountain extension tunnel, which is now in a little over 1,300 ft, struck a gravel channel a few days since. The ground consists of washed quartz boulders and pipe-clay where struck. Just precisely what the character is cannot yet be told with certainty, as it has not been prospected to any extent.

ORIENT.—The Orient placer mine, situated in the Negro Tent mining district, Sierra county, owned by Powell, Dehnake and others, of North San Juan, includes about 424 acres of ground. A tunnel has been run into the mine about 550 ft, and good paying gravel has been struck, but it was found the tunnel is not low enough. For the purpose of determining at what depth a new tunnel shall be run, the owners intend to commence sinking a shaft on the claim to the bedrock, if possible, which will decide the paying quality of the mine.

TULARE.

MCGINNIS MINE.—Visalia *Delta*, Nov. 21: The shaft in the McGinnis mine is down about 50 ft, and there is now a vein of ore from four to five ft wide in sight. Late assays made at Virginia City, Nevada, went $344 to the ton; $12 gold and $332 silver. A large body of ore has been discovered within a few days 200 or 300 ft west of the ledge on which the shaft is sunk.

EMPIRE MILL.—The Empire mill will be ready to run week after next. The battery is completed, boilers set, and engine in place. The hands are now working on the retort room. At the mine, the force has been doubled, and we are told that next week there will be enough ore ready to keep the mill two months. They are now down 65 ft in the shaft, and in rich ore.

TUOLUMNE.

OLSEN STRIKE.—*Independent*, Nov. 22: The recent rich strike on Widow Olsen's ranch, promises to be an important event in that section. It is some four miles from La Grange, on the Tuolumne, and about 20 miles south of Sonora. The vein is 12 ft wide, red-burned quartz, almost of a porphyry nature, and unlike any other vein ever found in this State. The main find has been sold by the prospectors, and bonded to capitalists by Mrs. Olsen for some $20,000. Croppings and locations have been made miles apart from the first discovery, on Dennis Phalen's property. Capitalists are interested, workmen are on the ground, houses are being erected, and soon a small town will blossom from the plain.

NEVADA.

WASHOE DISTRICT.

UNION CON.—Gold Hill *News*, Nov. 24: The ore and waste chutes at the 2400 station are completed, and those on the 2300 level are being put in.

CON. VIRGINIA.—The south drift on the 2150 level is passing through a favorable-looking vein formation showing low-grade ore.

OPHIR.—West crosscut on 2400 level is passing through vein matter carrying some quartz. North drift on Hardy vein, on 2400 level, is in ore giving low assays.

MEXICAN.—Main north drift on 2300 level is passing through bird's-eye porphyry having an easterly dip and carrying streaks of quartz. Joint Ophir west crosscut is in promising vein matter carrying low-grade ore.

CALIFORNIA.—Bottom of winze, on 1750 level, is in good milling ore.

SIERRA NEVADA.—The Superintendent says: During the past week work has been resumed in the northwest drift on the 2100 level for the purpose of proving the extent of the ore body in that direction. This drift is now in 27 ft from the station. We have not yet reached the ore body, but expect to in a few days. Face of north drift, on 2300 level, is in fine-looking quartz giving fair assays.

HALE & NORCROSS.—Occasional spots of ore are shown in crosscut No. 1 on 2200 level.

DUN GLEN DISTRICT.

ROYAL EAGLE.—*Silver State:* McK. Ross, one of the discoverers of the Royal Eagle mine, at Dun Glen, was in town yesterday. He says the new mine is looking splendidly as far as prospected. There is an immense quantity of gold-bearing ore in sight, sufficient to run a 10-stamp mill for two or three years. The ledge dips into the hill at an angle of about 30 degrees, but as yet it is only prospected to a depth of 20 ft.

ESMERALDA DISTRICT.

COPPER MINE.—*Herald*, Nov. 22. John Ludwig, who is the owner of the copper mine in Smith valley, about 10 miles northeast from Walker river, will shortly erect works on his mine for the reduction of the ores. All the copper ore which has been heretofore taken from this mine has been forwarded to Dayton, in Lyon county, and used in the manufacture of bluestone.

MOUNT ROSE DISTRICT.

BIG PRIZE.—*Silver State*, Nov. 18: Rich ore has been struck in the Big Prize mine. The extent of the ore body is not yet known, but it is said to be sufficient to place the Big Prize in the front rank of Paradise mines. The Big Prize was the first ledge discovered in Mount Rose district. Some rich ore was found on the surface. This created an excitement which resulted in the discovery of other ledges. The ore from the croppings of the Big Prize produced some $30,000; but the ledge pinched, and the owners, who were not practical miners, became discouraged and disposed of the mine to San Francisco men, who have had a few men at work prospecting it for two months past. The discovery of the ledge below the pinch or break indicates that it is a permanent vein, and is highly encouraging to other prospectors in the vicinity, as it proves that a break is not always the bottom of a vein.

PARADISE DISTRICT.

BULLION AND MARY WILDER.—*Silver State*, Nov. 18: S. B. Palmer, generally known as "Brick," brought some specimens of ores from the Bullion and Mary Wilder mines, in Paradise, to this office yesterday. That from the Bullion consists of native silver, ruby silver and quartz, and was taken out of the mine at the bottom of the shaft, 125 ft from the surface. He says there is over six ft of ore in the ledge at that depth, some of which assays over $12,000 in silver and gold to the ton. That from the Mary Wilder was taken out near the surface, and it assays over $6,000 to the ton.

PIOCHE DISTRICT.

DAY MINE.—*Record*, Nov. 16: The last report of the Superintendent says: The late series of storms seriously obstructed our transportation of ore to the furnace at Bristol, but now, notwithstanding the very bad condition of the roads, our single teams are managing to get through. I am in hope of doubling up again, as usual, in a few days. We have a very good body of ore in upraise made from the northwest side of the main tunnel, near where we first struck ore. To my mind, it proves that we have the contiguity of the original ore discoveries made when the mine was called the Jackrabbit. Of course I do not pretend to say that we have such rich ore as found in the pockets above, but our ore bodies are very large, and the average is very encouraging. We have started a winze to reach our rich ore (as yet untouched) at the bottom of the cave, below the breast of the incline. This will be dead work for perhaps 10 days; it is, however, necessary to facilitate the extraction of ore. Our assays this morning from north drift and other sections are as follows: Stope, $131.93; raise, $81.68. Special assays run into the thousands, but they are not criterions whereby to judge the true value of the mine.

RAYMOND & ELY.—The following is the latest report of the Superintendent: On the 1100 level we are taking out plenty of good ore; on this level everything looks well,

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A Strange Arctic Region.

Whether the success of Prof. Nordenskjold in his voyage from ocean to ocean in the Arctic regions will ever be productive of commercial results or not, cannot now be determined. The discoveries made by him will, however, command the attention of scientific men, and perhaps be the means of solving many problems connected with the violent disturbances that have afflicted the globe and changed climates as well as the flora and fauna thereof.

When the ice closed in upon the *Vega*, and left the stout ship enslaved in those northern solitudes, Prof. Nordenskjold wrote a letter to Dr. Oscar Dickson, the main contributor toward the fitting out of the expedition, describing the scenes along the coast. The letter dispatched on the 20th of February, has at last reached its destination, and is now published in the London *Standard*. The letter calls attention, in the first place, to a group of islands which are very remarkable in a scientific point of view. These islands, the new Siberian, open the book of the history of the world at a new place. The ground there is strewn with wonderful fossils. Whole hills are covered with the bones of the mammoth, rhinoceros, horses, uri, bison, oxen, sheep, etc. The sea washes up ivory upon the shores. In this group is possibly to be found the solution of the question of the ancestry of the Indian elephant, and important facts with regard to the vertebrates which existed at the time of man's first appearance on earth. How came horses and sheep in a region now locked in the fetters of an eternal winter, uninhabited by men, not now supporting animal life in any form, and almost impossible of access? Prof. Nordenskjold was unable to solve the question himself, and he suggests that it is of the utmost importance to science to send a light draft steel steamer to those islands for a thorough exploration.

The new tribe of Indians found there, the Tschuktschi, are on the the original highway between the cradle of the human race and the home of the aborigines of the northern part of North America, and it is not thought that the resemblance between them and the Greenlanders is accidental. The arrival of the *Vega* on the Tschuktschi coast was an event like the landing of Columbus in the new world. It was an unprecedented occurrence, and made a sensation throughout the region.

East of the Lena, Prof. Nordenskjold found on shore no scattered blocks of stone such as are distributed over a continent by glaciers and such as are found elsewhere in Siberia. This fact was held to point to the absence of land out to sea north of that coast, and it excites anticipations as to the possible discoveries which are to be made by the *Jeannette*. Not the least of the peculiarities of this strange region is the fact that the coast appears to be rising slowly out of the sea. The inhabitants have to shift their villages at times nearer to the water, which is gradually receding from them.

Shipping Laws of the United States.

Under the head of "The Miserable Shipping Laws of the United States," the New York *Mail* makes additional comments upon an article in the Philadelphia *Record*. It is difficult to conceive of any grave reason why this country should not become the mistress of the seas, at least so far as the carrying trade is concerned. Evidently the only obstacle in the way is our own Government. We cannot say that there is a lack of common sense in not investigating this matter, but we may say that there is a lack of attention to the demands of the country for legal provisions which will advance its welfare. There never was such an opportunity for the United States to arrive at a legitimate superiority in the shipping trade, and if no attention is paid to the matter now, a future generation will point to the "possibilities," the "might have been" of blundering statesmen. We speak of progress, and our progress is more in talk than in action. Many of our laws are wholly inadequate for the development of the country, and yet they remain unchanged to the detriment of our greatest interests.

Speaking of the laws which prevent Americans from becoming ship owners, the Philadelphia *Record* says:

"Thus have we presented the anomalous spectacle of a people languishing in the overproductions of their own industries, unable to build ships, forbidden to buy them, and compelled to await the coming and going of foreign fleets and foreign merchants to develop a foreign trade which, to a large extent, is 'second hand.'"

To fully understand the meaning of the *Record*, we must notice what some of the provisions of the laws governing American ships are: An American can buy a foreign ship, but cannot have it registered in the United States. If an American resides in a foreign country, his ships, though built in the United States, forfeit their registry during their owner's absence, unless he is a consul or is connected with some house composed entirely of Americans. An American cannot sell half his ship to a foreigner without the ship forfeiting its registry. An American cannot have a ship registered when it is built in this country if he has a foreign partner. If a naturalized citizen goes abroad two years, every ship in which he owns the smallest interest forfeits its registry. In the meantime, iron steamships have well-nigh driven wooden ships from the sea. Plenty of first-class iron steamers are for sale in English and Scottish ports which American merchants would like to purchase, but our laws will not permit. It is time all those laws were stricken out, and the same freedom given Americans who may wish to purchase foreign ships that is given those who wish to buy a horse or a suit of clothes abroad. The laws were framed when the United States among powers was one of the weakest; they do not apply any longer. Half the profits to be derived from the food crops of the United States, when sent abroad, goes to the steamship companies which carry the freight to Europe. The *Record* estimates that a ship costing $250,000 will earn, running between the United States and Europe with cargoes one way, $2,224,000 in her natural lifetime of 20 years. This, too, only reckons freight at $6.50 per ton. From these figures it is easy to see that foreign ship owners are making as much from our harvests as the men who till the soil on which the harvests are planted. Then all the foreign commerce of the United States except a trifle is carried in British and German ships. And this is the case, too, when foreign markets are the great need of American manufacturers. Still, those obsolete laws are kept in force though our shipyards are idle and the men who were sailors in the old days of wooden ships are seeking other occupations on shore. If Congress were to try to prevent a State from selling its products, the people would raze the capitol to the ground. Yet they keep in force, year after year, laws which in effect say, "Half the profits of all the products you desire to send abroad must be paid to foreign ship owners." Is it not time that such laws were wiped out?

Mining Decisions.

In a recent number of the Salt Lake *Tribune*, "Pablo," in his regular letter from Washington, refers to the following points decided under the mining laws, in regard to placer claims.

Acting Commissioner Armstrong, of the General Land Office, replies to a letter of inquiry: That since the act of July 9th, 1870, it has been continuously the practice in the Land Department to recognize the right of an applicant for patent for placer land to embrace in his application survey, entry, and patent, two or more original contiguous locations held by him by purchase, although exceeding in the aggregate 160 acres in area; such original location being in conformity with law.

The protest of Geo. W. Hall, *et al.*, Central City, Colorado, against mineral entry No. 1129, has to-day been dismissed and the original entry approved for patent when reached in its regular order.

This protest has attracted considerable attention in mining circles. It was made on the 15th of March last, against allowing the entry of the Hunter lode and mill-site. The entry—lot 826, A and B, was made March 20th, 1879, by the Equator Mining and Smelting Company. The protest, supported by several affidavits, is based substantially upon allegations that the Hunter lode is located on the side of a mountain immediately below certain patented claims which have used the land embraced in the Hunter claims for several years as dumping ground; that the claims are so situated that in the due course of mining it is necessary to throw large quantities of debris upon said ground; that there is no vein or lode, or valuable deposit of minerals at the discovery shaft of the Hunter lode, and that no vein or lode has been discovered within the limits as required by section 2320, U. S. Revised Statutes.

The Equator Company file affidavits alleging the existence of a well-defined crevice of mineral-bearing rocks in said discovery shaft; it is also alleged under oath that on the western portion of said claim large quantities of valuable silver ore have been taken out, the mine at the point being worked at a depth of 360 feet from the surface.

The Hunter claim intersects other valuable claims; the locality is undoubtedly mineral, and no presumption exists that the land is non-mineral.

Mr. Armstrong, the Acting Commissioner, says in view of all these facts: "I regard the proof of discovery of a vein or lode, prior to location, as satisfactory. The fact that the claim has been used as dumping ground, and is convenient for such purposes constitutes no objection whatever to its location and entry. It is conceded to be public land to which no adverse claim has ever attached. It is shown to be mineral land, properly located and it will be patented when reached. No valid objections appear to the mill-sites."

In consequence of a law in Oregon providing that but 300 feet in length can be located on a lode or claim, the General Land Office makes the following statement: Section 2320 of the U. S. R. S. provides that: "A mining claim located after the 10th day of May, 1872, whether located by one or more persons, *may equal*, but shall not exceed 1,500 feet along the vein or lode," and no authority to restrict such length is delegated to any State, Territory or mining district organization. By the same section it is permitted the organization named to fix the width of lode claims with the restriction that no greater width than 300 feet on each side taken nor the width limited less than 25 feet on each side of the middle of the vein.

The Oregon law, therefore, is in conflict with the express authority of the United States Statutes, and has no effect in determining the rights of a locator.

The Boom in the Lumber Interest.

We know of nowhere that a "boom" can be more properly placed than in saw-logs and their resultant products. At all events there is a boom, and during the last week, there has been an advance of about $4 per thousand in "rough redwood," and a corresponding appreciation in finished lumber. This is the direct result of the better feeling which has crept into all our industries and in sympathy with the advance in other building materials. There has been an advance all along the line of builders' supplies, and those who have been intending to build during the cheap times, but have thus far failed to place their contracts, may now add perhaps 20% to former estimates.

It is a peculiar and yet a clearly intelligible disposition of the public, to refrain from using building materials when they are at a very low mark. Such low values are of course incident upon a slack demand, and the slack demand is the product of "dull times." It takes an amount of heroism to build as an investment simply because one can build cheaply, and such heroic action is seldom indulged in. When lack of confidence is general, few are strong enough in hope to stem the tide. Therefore while building material has been at bedrock prices, there has been but little building except such as was done for present use, or immediate sale to users. And now with affairs looking up and a general tone of trust in the community, building will revive and the rise in materials will be counted a small objection when the other attendants of investment are so auspicious. We can but hope, however, that our friends who have been long contemplating improvement in their homes and outbuildings, have already carried out their plans, for there will probably be enough new ventures incident upon the return of prosperity, to sustain the better rewards which seem now to be before our vast lumbering interest.

The rise in lumber prices will be heralded with satisfaction in our forest counties, where for a long time the pall of unprofitable production has rested. The axes will ring and the brisk stroke of the "cross cut" will invade the solitary sighing which the woods have long enjoyed. The desolate mills will again warm their boilers, and a host of idle men will rally again in the fragrance of the sawdust. The thriving coast towns of the north will awake from their lethargy and feel the spirit of advancement which they have been long awaiting for, the wharfs will again be covered with lumber awaiting shipment, and the long chutes will be dangerous for those who lay hold upon the hand ropes. Nor will the interior lumber interests be less stimulated. The general result will be most gratifying to those who hold timbered property, to those who labor in the mills, and to all who furnish supplies to a busy people. The lumber-producing interest of our State and of the coast besides is a grand one, and one which is apt to be overlooked by those whose only hint comes from the carload of boards. The coming of better times to the lumbermen means the extension of comforts to many thousands of our citizens, and therefore should be hailed with general satisfaction.—*Pacific Rural Press.*

Relics of the Mound Builders.

During the grading for the Chicago & Strawn railroad, four miles up the Kankakee river from Wilmington, Illinois, a bank or mound of stiff, clayey sand, about forty feet in diameter and ten feet in hight, was cut into by the graders, and skeletons, pieces of pottery, and copper implements were found. The mound, which is situated near Forked creek, about a mile east of the Kankakee, is very compact, and is known generally as Smith's Indian Mound. The skeletons which have been unearthed are in a poor state of preservation, the largest and hardest bones only being found; and, by comparing their condition with that of bones found in a similar soil and latitude, whose ages have been determined, the only conclusion to be arrived at is, that these are those of the Mound-Builders, and were placed in the ground over 2,000 years ago. On each side of the head of the skeletons, near where the ears were, were found pieces of copper about an inch and a half in thickness, and these, it is supposed, were used as ear-ornaments or ear-rings by the ancient owners of the skulls. They are well-shaped and have a circumference greater than that of the average skull of the present day. By the length of the thighbones it is judged that these aborigines must have been fully six feet in hight, and some of them are probably seven feet. One skull, of twice the size of any of the others found, was sent to a gentleman in Chicago.

By the side of the skeleton (or rather where the skeleton was) belonging to this skull was found a large kettle containing several flint arrow-heads and a copper-blade. The blade is about four inches in length and half an inch in thickness, tapering towards the edge from the center. It is now in the possession of Frank Larned, of Wilmington. As Lake Superior is the nearest point from which copper can be obtained, this metal was probably brought from the Gulf of Mexico. The vases seem to have been made of pounded shells mixed with blue clay. Some of the vases are ornamented by scroll work, nearly the same as the engravings on the outside of water-cases, and others by fancy but regular indentures. Dr. E. R. Willard has in his possession one, about five inches in its greatest diameter, four inches high, and four inches through the top, with places on the sides showing where the handles had been. Most of the skeletons are found at a depth of five or six feet, lying face downward, with the head toward the northwest. Pieces of burnt red clay, varying in shape and size, and placed about eight inches apart, surround the skeletons.

A Practical Calculating Machine.

The arithmometer or calculating machine, of M. Thomas, of Colmar, was invented in 1820. Since then it has undergone many improvements at the hands of the inventor and latterly of his son, M. Thomas de Bojano, so that it is now offered in a form which M. Sebert, in a recent report to the Paris Societe d'Encouragement, pronounces to be thoroughly adapted for practical use. The machine performs all ordinary arithmetical operations, comprising the extraction of roots. Among the more important recent improvements (for details of which we must refer to the *Bulletin* of the society just named), is the counter of the number of turns of the motor handle, and the automatic inscription of successive figures of results, in divisions and extractions of roots, and of multipliers and multiplications, relieving the mind of the operator greatly. An idea of the progress of the machine, may be had from the fact that the product of the number 99,999,999 by itself, is formed by the new machine in 24 seconds; it took nearly a minute in 1851. The new machine can also go beyond the former in giving the product of the number formed of ten nines by itself, which it does in 28 seconds. The product of the number formed of eight nines by the number formed of eight fives is now obtained in 17 seconds, as against about 45 seconds in 1851. Processes of addition alone are not performed much more quickly than by an expert calculator, but mental fatigue is at least saved. The machine is well adapted for complex operations, as in calculations of algebraic formulæ for ordinary calculations relative to constructions, cubages, estimates, etc., for calculation of formulæ into which trigonometrical values enter, and here it allows of dispensing with the use of logarithms, tables of natural trigonometrical lines being used. In construction of tables of multiplication, ready reckoners, etc., the machine gives results that are truly marvelous. The popularization of the machine has been slow, but (with removal of imperfections) has considerably improved, as the following figures show: In the 44 years, from 1821 to 1865, only 500 machines were sold; in the 13 years, from 1865 to 1878, 1,000, viz., 300 in the five years, 1865 to 1870, 400 from 1870 to 1875, and 300 from 1875 to 1878, or 100 a year. Of the latter number about three-tenths are six-figure machine, six-tenths eight-figure, and only one-tenth ten-figure. Of 100 machines sold, 60 go abroad and only 40 remain in France. Among other establishments in France which use the machine may be mentioned the Magasins du Louvre, the Compagnie des Petites Voitures, the offices of the Artillery Service, Assurance and Railway companies, the Observatory, the Ecole Polytechnique, and Creusot. It is estimated that a machine will work daily for ten years before requiring repair; and from the nature of the component parts repair is easy. The price is rather high, 500 fr for a six-figure machine; and M. Sebert is of opinion, considering how largely the manufacture involves the easy repetition of similar pieces, that this might be so organized as to supply the machines at half the present price.—*Iron.*

THE MICROSCOPE IN THE WITNESS BOX.—As the New York *Tribune* says, the scientific aspects of the evidence against the Rev. Mr. Hayden, of Madison, Conn., for the murder of Mary Stannard, are truly remarkable; indeed the microscopic exhibition of arsenic and the comparison of arsenical crystals show that the law has a powerful auxiliary in chemistry. After the arrest of Mr. Hayden, and the disinterment of the remains of the dead girl for examination, it was claimed that all of the arsenic which Hayden had bought was still in a box in the barn. There a box was found containing a full ounce. It was shown that the arsenic found in Mary Stannard's stomach could not have been taken from this box. At this point recourse by the prosecution was had to Prof. Dana, who visited England, studied the manufacture of arsenic, and then, by the use of his microscope on the crystals, demonstrated that the arsenic from the girl's stomach was an entirely different lot from that hidden in the barn, and that it was identical with the arsenic sold by Tyler, at the time when Hayden is known to have bought his ounce. The conclusion sought to be established is that a part of the arsenic bought by Hayden was used to poison the girl, and that the rest was flung away, and that the barn arsenic was bought elsewhere afterward merely as a blind. The crystals of the stomach arsenic are three or four times as large as those of the barn arsenic, but none of them are large enough to be visible without the microscope. Hereafter criminals will do well to recognize in science one of the agents of possible detection.

THERE was an increase in the national bank circulation for October of $3,500,000. The demand is steadily increasing, and the indications are that more will be taken out during the coming month than for any preceding month in several years.

Influence of Planetary Movements,

It has been assumed by certain *soi disant* scientific observers, that terrible troubles are to be brought upon the earth by the planetary movements occurring between 1880 and 1887. The assertions that calamities are to afflict the air, land and water, have been so often repeated, and so much rhetorical flourishing has been indulged in the description of the dreadful evils to come, that many people have ceased to argue the matter, and have settled down into that calm belief which accompanies the apprehension of the inevitable. Prof. R. A. Proctor, however, is not of those who has been frightened at the predicted disasters, and goes into the merits of the thing in the following vigorous style:

"Whether the American 'professor' who announces these coming troubles is in any way related to the New York astrologer who wants money for calculating the planets, I do not know. But certainly they play into each other's hands. To say the truth, as the *Athenæum* recently pointed out, astrology has been looking up of late; a mischievous result of the theories which have been recently propounded respecting the influence of sun-spots on the weather, commerce and other matters—theories notoriously propounded in the first instance in order to obtain money from Government for certain greedy scientists, who were to watch the sun for us, and promised all manner of good things when once the money had been advanced. I do not think the Government is very likely to waste any money over such experiments, and, indeed, the Physical Observatory advocates have latterly been far less noisy than of yore, feeling, perhaps, that they have shown their hand somewhat prematurely. But much mischief of another kind has resulted. Because these persons, and some who innocently enough had joined them, assert that sun-spots affect terrestrial relations in certain definite and ascertainable ways (for which statement there is not a particle of valid proof), and because it is supposed that the planets affect the sun-spots (for which supposition also there is no evidence whatever, but very strong evidence against it), we are to believe that, after all, the old astrologers were right, and the planets influence the fates and futures of men, not directly, but still effectively, though indirectly. Of course even the advocates of sun-spot influence and the believers in planetary power to generate sun-spots would reject this preposterous inference. But it finds acceptance among the ignorant; and those rascals who are always on the watch to find new ways of swindling the public, take advantage of the fact. It ought not to be necessary for me to say a word about the grim tidings announced by the American 'professor,' for they have not a particle of scientific significance. But in so far as such predictions (save the mark!) are based on the idea that the planets influence the sun's photosphere, I may say so much as this, that instead of the giant planets, Jupiter, Saturn, Uranus and Neptune, being the chief solar disturbers, even according to those students of science who maintain this theory, Venus would be and is more powerful than any of those planets, and our earth more powerful than the three outermost of the giant planets. To see this it is only necessary to remember that the tide-raising power of a planet or other orb (that being the nature of the influence assumed according to this theory), does not diminish as the square of the distance increases. Thus, putting Saturn's distance at only 9 instead of 9½ (that of the earth as unity), and the mass of Saturn at 90 times the earth's, Saturn's influence would be to the earth's as 90 to the cube of 9, that is as 90 to 729, or less than one-eighth of the earth's. Jupiter would exceed the earth's (roughly) as 300 exceeds the cube of 5, or as 12 exceeds 5; but would be far less than that of Venus. Then, again, the simple conjunctions and oppositions of the most effective planets would be far more effective than the perihelion passage of all the planets. Since we survive the conjunctions of the earth and Venus, we are not likely to perish even though the giant planets should pass their perihelia at about the same time, which, however, never has happened within historic times, and certainly will not happen for many centuries to come."

A Large Electro-Magnet.—Mr. Charles Reitz, of Indianapolis, Ind., sends us a description of a large electro-magnet made by him for Prof. Zahm, of the University of Notre Dame. The length of the cores is 30 inches, diameter 4 inches. Heads, of rubber, one-half inch thick, 9 inches in diameter. The yoke is 3¾ inches thick, 6½ inches wide, and 18 inches long, with 3-inch slots to admit of moving the cores. The bolts which connect the cores with the yoke are 1¼ inches in diameter. The cores are wound with eight layers of No. 6 cotton-covered copper wire, the wire being wound double, and the alternate layers being provided with terminals, which are connected with a plug switch on the baseboard, so that the electric current may be sent through the coils in various ways. The magnet is provided with two sets of pole extensions for diamagnetic experiments, one set being conical, the other flat. The armature is 15 inches long, 3 inches thick, and 4 inches wide. Different effects may be produced in this magnet by connecting the coils with the battery in different ways. The changes that may be made in this way are almost without number. It is estimated that the magnet, with proper battery power, will lift three tons. The weight of the magnet and its attachments is 800 pounds.

Useful Information.

A New Fluorescent Body.

According to the *Journal of the Chemical Society*, C. O. Harz has discovered a new fluorescent body in *spergulin*. This product occurs in the seed coverings of the caryophyllaceous plants, *Spergula vulgaris* and *S. maxima* (Anglice "Spurrey"). It is produced at the time when the seeds blacken and are nearly ripe. Spergulin is very soluble in absolute and aqueous alcohol. Viewed by transmitted light the solution appears nearly colorless, with a shade of olive-green; by reflected light it exhibits a dark blue fluorescence. It has not yet been obtained in the form of crystals. It is very soluble in methylic alcohol, less so in amylic alcohol, and scarcely soluble in ether or petroleum. Concentrated sulphuric acid dissolves it, forming a dark blue liquid. The fluorescence of an alcoholic solution of spergulin is maintained for more than a year if the liquid be kept in darkness, but is rapidly destroyed by the action of direct sunlight, and more slowly by that of diffused light. Small quantities of caustic alkalies, or alkaline carbonates, added to an alcoholic solution of spergulin, transform it into an emerald green fluorescent body; and basic lead acetate produces a precipitate. The new compound contains 61.85% of carbon, 7.05% of hydrogen, and 31.8% of oxygen. It appears to be related to chlorophyl, and is probably closely allied to phyllocyanin. An alcoholic solution of the product showed strong absorption, almost entirely in the violet; and in this respect differs considerably from chlorophyl, phyllocyanin and phyllo-xanthin. Mr. Harz is disposed to regard spergulin as a feeble acid, the acid salts of which, as well as the acid itself, exhibit blue fluorescence, the neutral salts exhibit green fluorescence, and the basic salts are destitute of fluorescent properties.

How Bog Oak Ornaments are Made.—When taken up, Irish bog oak is perfectly black from the action of the peat or bog water. It is very rarely obtained in a sound state, and in most cases the outer portions of the tree or log are rotten and useless even for fuel. When laid up for use, care must be taken that it is not placed in the open air, lest it may, from the sun's rays, become open and shattered into chips from end to end. To preserve it, it must be put into some cool place, and left to dry gradually, and when properly seasoned it must be cut in lengths of from two to four feet, and these lengths be split again, and the sound parts be removed from the unsound. It takes from four to six years to season some specimens, as, in many instances, the wood is found at a depth of eight and sometimes ten feet under the surface. When properly seasoned any portion requiring to be glued becomes hard as stone, and is firmer and less liable to give way than any portion of the manufactured article. The finish is not quite perfect until the article has been for some time in use, and the longer the finer the article seems to be, no matter whether used as a personal or table ornament. The men employed are all without exception, self-taught; each one makes his own tools and will not take any apprentices; and each person has a peculiar taste for certain kind of ornaments, which he follows, and which he is left to produce the best specimens he can. There are jewelers who mount and embellish the ornaments with gold and silver, and with rare and most brilliant Irish gems, such as the Kerry Irish diamond, the emerald, the garnet, amethyst, beryl, aquamarine and Doncgal pebble. The Celtic ornaments are generally studded with the above native gems. They are beautiful and most artistically executed.

How to Determine the Quality of Silk.—A writer in the Hartford *Courant*, speaking of the various kinds of black silk, gives the following directions for detecting the spurious from the genuine article: "Take ten fibers of the filling in any silk, and if on breaking they show a feathery, dry and lack-luster condition, discoloring the fingers in handling, you may at once be sure of the presence of dye and artificial weighting. Or take a small portion of fibers between the thumb and forefinger and gently roll them over and over and you will readily detect in the one the gum, mineral, soap and other ingredients, and the absence of them in the other. A simple but effective test of purity is to burn a small quantity of the fibers; pure silk will instantly crisp leaving only a pure charcoal; heavily dyed silk will smolder, leaving a yellow, greasy ash. If, on the contrary, you break the ten strands and they are of a natural luster and brilliancy, and fail to discolor the fingers at the point of contact, you may be well assured that you have a pure silk, that is honest in its make, durable in its wear."

To Convert Agates into Onyx.—The agates, ground to their proper shape, are allowed to remain during a period of eight days in a solution of iron in aqua regia. Those portions of the stone which are to be made white are dipped for the same time into a solution of equal parts of potash and caustic potassa in water. The articles are then dried and finally burnt in a stone vessel. This process is carried on at Obarstein, Germany, the center of the agate industry of Europe.

To Prevent Nets from Rotting.—The following treatment is said to preserve nets for a long time in good condition: Soften one pound good glue in cold water, then dissolve it in ten gallons of hot soft water with one-half pound curd soap. Wash the nets in soft water, then boil them in this for two hours, press out excess of the liquid and hang up over night. The second bath consists of alum 2 pounds, water 5 gallons; heat nearly to boiling, and immerse the nets in this for about three hours, then press and transfer to a strong decoction of oak bark or a solution of sumac in warm water (water 5 gallons, sumac 8 pounds) and let them remain immersed in this for 48 hours, or longer if convenient.

Fruitfulness of a Grain of Wheat.—If, says a writer in a German contemporary, we reckon that a single grain of wheat produces 50 grains, and that these 50 will each produce 50 grains more, and so on, we find:

In the second year.....	2,500	grains
" third "	125 000	"
" sixth "	15,625 000,000	"
" twelfth "	244,140,625,000,000	"

The third year's crop would give 300 men one meal, leaving enough bran to feed eight pigs for one day. The produce of this single grain in the twelfth year would suffice to supply all the inhabitants of the earth with food during their lifetime.

Gray Packing for Marine Engines, etc.—Grind together cleaned Java rubber, 5 lbs.; Para rubber, 25 lbs.; oxide of zinc, 10 lbs.; carbonate of magnesia, 6 lbs.; porcelain or Cornwall clay, 3 lbs.; red lead, 2 lbs.; pure sulphur, 30 ozs. It may be proper to state that good purified Java rubber might be substituted by engineers with good effect for Para rubber in the above and some other compositions.

Light Buffer Springs.—Grind together clear Java rubber, 25 lbs.; Para rubber, 5 lbs., common magnesia, 10 lbs.; pure sulphur, 25 ozs. This is brown at first, but in a few days turns gray or white, and just sinks in water. Springs made from this compound, 4½ x 2½ x 1, pressed to half an inch, showed 3½ tons on the dial.

To Prevent Leakages.—Make a composition of four pounds resin, one pint linseed oil and one ounce red lead. Apply it hot with a brush to the place where the L joins the main house, or for a dormer window that leaks, or around chimneys. For making water casks tight, it has always proved effectual.

A cheap filter can be made from a common garden pot. The hole is plugged with a sponge but not too tightly; a layer of powdered charcoal is put in the pot two inches deep, then a layer of the same quantity of clean sand, and upon that a layer three inches deep of clean coarse gravel.

Papier Mache for small work is made by boiling clippings of paper in water, beating them to a paste, adding glue or gum sizing and pressing into oiled molds.

Good Health.

Headache.

A lady asks for a few thoughts on the subject of the headache so common among her sex. Perhaps as common a form of headache is that known as migraine. It is supposed to have its origin in a tendency of certain tissues of the brain near the pons to take on by exciting causes slight inflammation, or severe congestion. These headaches generally come on after various gastric disturbances, the use of strong tea, or alcoholic drinks, overloading the stomach with indigestible food, especially hot biscuits or hot bread, over-fatigue, night work, nervous excitement, worry, etc. These, however, are only the exciting causes, the predisposing causes being the tendency of these tissues to take on a highly congested state, as before stated. If the sufferer will carefully avoid these habits which bring on the disease the attacks will be less frequent and less severe. In very many cases it may be cut short altogether or greatly mitigated in its severity by proper treatment. A hot foot and a leg bath continued for 30 minutes, while the head is manipulated by the hand of an attendant frequently dipped in cold water, will often alleviate or cure an attack. What is known as magnetizing the head will often cure the worst cases and send them to sleep. Both these methods are very simple and effective. Shampooing the head, as is done by a barber, is sometimes effective. To this ladies often object, as they do not like to wet their long hair. An instrument has been invented by which a lady's hair may be thoroughly shampooed without disturbing the clothing, and dried in a few minutes by steam; and if it could come into general use in cities it would be a boon to women.

Persons who are subject to headaches should wear as little hair as they can, and if they would wear it short, and thoroughly wet and rub their heads every day it would be very beneficial. Hot water applied to the back of the head and spine will often stimulate the vaso-motor nerves to contract the vessels of the brain and discharge their contents, thus relieving the congestion. A stream of hot water from a fine spray along the spine will do the same. As a rule, however, the latter means are inaccessible to most persons, and so the former will be more appropriate. It is very desirable to break up the habit so far as possible, so as to make it unnecessary to cure; and this is done by whatever permanently invigorates the system and equalizes the circulation. Bathing and friction to the skin, and a simple, healthful diet are of the first importance. Out-of-door exercise is equally necessary.

Hot and Cold Baths.

The London *Lancet*, in a recent number, points out the difference between the effects of hot and cold baths. The effects of the cold bath, it says, being mainly due to impressions made upon the cutaneous nerves, the modifications of the cold bath largely depend on their power of increasing its stimulating action. The colder the water, the more violent the impression. The frequent change of water, such as is found in the sea or in running streams, increases the stimulating effect. Great force of impact, as when water falls from a hight or comes forcibly through a hose upon the body; the division of the stream, as is seen in shower baths and needle baths, and the addition of acids or salt to the water, all act, it would seem, by increasing the stimulating power which the water exerts upon the cutaneous nerves. Warm baths produce an effect upon the skin directly contrary to that brought about by cold water. The cutaneous vessels dilate immediately under the influence of heat, and although this dilation is followed by a contraction of the vessels, this contraction is seldom excessive; and the ultimate result of a warm bath is to increase the cutaneous circulation. The pulse and respiration are both quickened as in the cold bath. The warm bath increases the temperature of the body, and, by lessening the necessity for the internal production of heat, increases the call made upon certain vital processes, and enables life to be maintained with a less expenditure of force. While a cold bath causes a certain stiffness of the muscles, if continued for too long a time, a warm bath relieves stiffness and fatigue. The ultimate results of hot and cold baths, if their temperature be moderate, are about the same, the difference being, to use the words of Braun, that "cold refreshes by stimulating the functions, heat by physically facilitating them; and in this lies the important practical difference between the cold-water and hot-water systems."

Dandruff Cured.—The belief that dandruff arises from a disease of the skin, although physicians don't seem to agree on this point, and the knowledge that the use of sulphur is frequently attended with very happy results in such diseases, induced me to try it in my own case. A preparation of one ounce flowers of sulphur and one quart of water was made. The clear liquid was poured off, after the mixture had been repeatedly agitated during the intervals of a few hours, and the head saturated with this every morning. In a few weeks every trace of dandruff had disappeared, the hair became soft and glossy, and now, after a discontinuance of the treatment for eighteen months, there is no indication of a return of the disease. I do not pretend to explain the *modus operandi* of the treatment, for it is well known that sublimed sulphur is almost or wholly insoluble, and the liquid used was destitute of taste, color or smell. The effects speak for itself. Other persons to whom it has been recommended have had the same results, and I communicate the result of my experiments in the belief that it may be valuable and acceptable to many who have suffered in the same manner as myself.—*American Journal of Pharmacy.*

The Way to Health.—The only true way to health is that which common sense dictates to men. Live within the bounds of reason. Eat moderately, drink temperately, sleep regularly, avoid excess in anything, and preserve a conscience "void of offense." Some men eat themselves to death, some drink themselves to death, some wear out their lives by indolence, and some by over-exertion, others are killed by doctors, while not a few sink into the grave under the effects of vicious and heastly practices. All the medicines in creation are not worth a farthing to a man who is constantly and habitually violating the laws of his own nature. All the medical science in the world cannot save him from a premature grave. With a suicidal course of conduct, he is planting the seeds of decay in his own constitution, and accelerating the destruction of his own life.

Cooling the Head.—Bay rum has a great reputation for this, and no doubt deserves it; but we believe that cold water is as good a remedy for the head as any, whether in the form of a shower bath or applied by a towel. In some forms of disease, so strong a cooling remedy as ice is beneficial; but this should never be applied except under the direction of a physician who watches the patient, because if applied when not needed, or if applied too long, it may act very injuriously.

A new mode of treating cancerous growths, tumors, etc., is to subject them to a stream of hot, dry air. This is proposed and has been successfully applied by Dr. G. A. Keyworth, of England.

MINING AND SCIENTIFIC PRESS.

W. B. EWER.....SENIOR EDITOR.

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The Week.

One of the events of the week is the occurrence of Thanksgiving day, the observance of which is specified in the President's and reiterated in the Governor's proclamation, a day of general rejoicing to all except to the unfortunate turkeys, which are compelled to participate in the observance of the day. On this coast we do not feel the dread blasts of winter, nor witness the snowy-covered fields, which form a marked contrast with the appearance of the day in the Eastern States.

Severe weather has in some places delayed mining operations, but very little damage has been done. General preparations are going on for renewed activity in mining, in spite of the setback of a few stormy days.

The rains give promise of a good water supply, and there is no occasion for fears of the future in that respect. Most of our exchanges concur in saying that there is more activity in mines just now than at any time within the previous ten years. Many new discoveries are reported from the old mountain mining counties, and the general outlook is good. There seems to be some apprehension on the part of the farming community that the miners, having gained the day in the Supreme Court, will now proceed to ruin the agricultural element; but we are assured by our mining exchanges that nothing but justice will be exacted, and the golden rule carried out. The wholesale attempt to crush mining enterprise at one sweep must cause some hard feelings, yet we are sure the farmers will understand the miners better, whether that knowledge is gained through sad experience or otherwise. Every indication points to the propriety of good feeling and a general renewal of prosperity, instead of the damaging and fatal personal warfare that may be kept up whenever the courts are invoked to settle questions, which brotherly love and true business instincts are abundantly competent to arrange amicably.

A Reward to Inventors.

At a recent meeting at Chicago of the American Humane Association, a prize of $5,000 was offered for an improved stock car capable of carrying live animals long distances without needless suffering.

We certainly think that the inventor who will contrive a cattle car free from objectionable features, will reap a reward compared with which the offer of $5,000 would be a small sum. There is undoubtedly room for invention in this business, and the demand for an alleviation of the sufferings of cattle during transportation is becoming greater, as the carrying of stock on railroads increases in magnitude. It has been estimated that the saving in shrinkage in cattle between Kansas City and New York or Philadelphia, by proper appliances for food and water while *en route*, would nearly pay the cost of transportation, hence the opportunity to inventors to reap an immense reward.

There are numerous patents upon cattle cars, and many efforts have been made to introduce them, but the general similarity of design occasioned suits for infringement, which virtually destroyed their humane utility.

The old National Cattle Car Co., of Chicago, with Zadoc Street and his son John W. Street, procured the manufacture of about thirty cattle cars, by the McNairy & Claflin Manufacturing Co., of Cleveland, Ohio. The cars contained all of the appliances peculiar to cattle cars, viz.: feed boxes and water troughs, by which the animals could be cared for from the outside of the car, and flexible slatbars, forming the stalls. Some of them were even padded. Several carloads of cattle were transported successfully in them from St. Louis to Philadelphia. But, unfortunately, it was claimed that the company were infringing upon patents owned by Amos Bank, of Salem, Ohio, and John W. Gill, of Columbus, Ohio, which gentlemen had made preparations, with a capital of $100,000, to build these same, or substantially the same kind of cars. The matter got into the courts and terminated the usefulness of the inventions, because railroad companies preferred a clear title to the patented contrivances used upon their lines, and hence would have none of them. We give this slight sketch because Mr. Zadoc Street seems to be an active member of the American Humane Association. He owns a number of patents and would undoubtedly be glad to have them put into use upon the railroads. The matter is one which would bring enormous advantages to an inventor, and we urge upon all those interested to strain a point and examine the question, although the matter of the reward of $5,000 is a very small inducement, as the properly constructed cattle car would have the transportation of the millions of live stock annually carried from the plains of the West to the Atlantic seaboard.

The main points to be observed in a cattle car are to provide moveable stalls for each animal, allowing them freedom of action in standing or lying, and to prevent them from interfering with each other. The slats or bars composing the stalls frequently gall or skin the animals, which strike against them when the train stops or moves ahead, and this must be provided against. Means of feeding and watering from the outside must be provided, and above all, provision should be made to counteract the jarring motion of the car, which seems to have a bad effect upon the animals. This latter point has never been touched in former patents, and was suggested as a proper subject of inquiry by a high judicial officer some years ago. In the case of hogs and sheep, small pens should be provided so that danger from smothering will be avoided. The great object of the inventor in this line must be to provide a means of transporting cattle so as to reduce their shrinkage to a minimum.

SIERRA MOJADA MINES.—Two miners of San Antonio, Texas, returned home after two months prospecting in these mines, and report plenty of rich ores, but nothing fabulous. They say that the ore will assay from $90 to $180 per ton. Over one hundred mines have been located. Another prospector writes to a Tucson paper and discounts largely the reported fabulous richness of the new discovery. The writer speaks disparagingly of the new district. On the other hand, Prof. Schuchart, engineer appointed by the State of Coahuila, a man of great experience, freely gives his opinion as to the paying quality of the Sierra Mojada mines: he finds lumps of silver lying around loose. Capital, science and labor are necessary; 1,200 are now at the mines, 70 of whom are Americans. Plenty of drinking water, wood and provisions are abundant at moderate prices, good grazing, machinery greatly wanted. Ore is found on the surface assays of which will pay a handsome profit to a stamp mill. The location of these mines, so far as our information goes, is as follows: 450 miles south of El Paso, 250 miles northeast of Mazatlan, 400 miles due west from Corpus Christi and 350 miles southwest of the present terminus of a railroad in southwestern Texas which connects directly with Galveston, New Orleans, Shreveport and St. Louis.

BY the burning of the British steamer *Bremer Castle*, at Singapore, the New York underwriters will lose from half to three-quarters of a million of dollars.

Mining Law Suggestions.

In his testimony before the Land Commission, ex-Senator Sargent furnishes some very interesting information upon the workings of our present mining laws. Mr. Sargent considers the laws relating to placer claims excellent. In regard to the title, particularly to ancient claims, the statute dispenses with proof of original location and the chain of title reaching beyond the period of the statute of limitations, makes it possible to acquire the right to these claims with certainty. Some rule might be prescribed which would govern original locations to be hereafter made, but it would be difficult to prescribe one that would operate equally in reference to development and working. So much depends in placer mining upon water, and the seasons are so uncertain and water is so frequently scarce, that, unlike the case of quartz mining, regular or profitable work, work in good faith, and not mere form or show of work, is often impossible for considerable periods of time. A claim may depend wholly on the rains for water, and get none during a dry season. If the law should require so much work on a mine every year during that dry year it could not be obeyed, at least, in good faith.

There seems to be no objection to the consolidation of two or more claims in the hands of one person or company by purchase. Indeed, this is often necessary for purposes of development. An individual or company may be willing to undertake the construction of a bed-rock tunnel or long water ditch for the mineral presumably in two or three claims, but not for that in one. The law should not binder such enterprises.

While the laws relating to placer claims, would need but slight changes, the laws for the location and purchase of lode claims are in a much more unsatisfactory condition.

Where the "croppings" of a ledge are not visible through the whole length of a claim, the miner may expend thousands, perhaps a hundred thousand dollars, in determining the course of the vein, only to find that his location embraces but a small part of it, and some one who has not spent a dollar may get the lode by an adjoining location.

Under the recent ruling of the Supreme Court of the United States, when a ledge goes out of the surface lines of a claimant he has no right to follow it. This is, perhaps, a fair interpretation of the quartz laws, but it suggests the need of amendment to avoid a great hardship and injustice to discoverers. The old miners' law treated the subject better, and gave a locator so many feet from his starting point in any direction "following the ledge, with all its spurs, dips, angles and variations." This is common sense, and it secured to the discoverer or developer of a ledge the full extent of his claim, no matter in what direction it ran under ground. It is often impossible to determine where the "apex" of a vein is, or its course, or the angle or direction of the dip, by the early workings, and, therefore, the intended rights of a discoverer are poorly defined and protected in locating a claim under existing laws. The impossibility of determining these things without extensive development, which must follow and not precede location, has led to much litigation and injustice.

Another feature of mining locations that leads to litigation, is where the discoverers of veins, or their assigns, are compelled to defend their rights from subsequent locators in their immediate neighborhood when the legal attack is directed to the portion of the dip of the lode which has passed beyond the exterior lines of the surface tract. But a quartz mine would be of no value, in most cases, where the locator had not the legal right to follow his ledge down at any angle it might take, and to any distance. Only claims of extraordinary richness could be worked where the possessors were confined within perpendicular side lines.

It is essential to retain in the United States mineral laws a provision by which locators can follow the dip of their claims outside their side lines, even if litigation does sometimes ensue. Such litigation is caused by questions as to identity of ledges and not from abstruseness of principle. The Government, in dealing with these matters, must get nearer to, rather than farther from, the old mining laws, which gave the locator his ledge wherever it dipped or however it crooked. It was still a question of identity, often contested, but the laws did as much as possible towards assuring a workable claim to the discoverer and his associates.

The only safe rule is to let the miner follow his ledge wherever it goes in direction or dip, without regard to surface ground. If that right is restricted, mining is rendered hazardous and uncertain to the extent it is restricted.

THE Nicaraguan Minister says he will meet Grant in Philadelphia early in December. Ammen has assurances that if $20,000,000 of stock can be sold in the United States, the balance of the $100,000,000 can be obtained in France without going to England for the money. French capitalists desire the control to be kept in that nation.

M. PALEN, of San Bernardino, is mining for coal in the mountains some ten miles from that place. We saw favorable looking croppings from the ledge exhibited at Starke's hotel.

Trade-Mark Law Unconstitutional.

The Supreme Court of the United States on the 17th of November inst. adjudged the act of July 8th, 1870, regulating the registration of trade-marks to be unconstitutional. It appears that under this law about 8,000 trade-marks have been registered, and about 200 applications for registry are now pending. Prior to the passage of this above act, there was a general desire to devise some means of providing for the recording of brands, or trade-marks, used by business men to identify their goods. The common law gave them the right to proceed in damages against any person who should counterfeit the same, and this right was not intended to be taken away by the act of Congress. The difficulty in the way of successfully prosecuting a suit for damages lay mainly in the proof of novelty of design. This was accomplished by showing priority as to time, which could not always be done by reason of exact dates, not having been entered of record. Hence, many persons presented their trade-marks for record to the clerks of the United States District Courts under the copyright laws, which afforded no protection; indeed it was declared by the courts that trade-marks could not be the subject of copyright. And orders were issued the clerks of the United States District to refuse certificates of copyright to all persons applying for the same upon trade-marks, the distinction being that the copyright laws were intended to apply, among other things, to such objects as could be denominated works of arts, possessing an intrinsic value and intended for sale as such. The trade-mark possessed none of these requirements, being only a badge, or label, intended to be attached or affixed to some other object of value. Besides trade-marks were amply protected by common law, and not a few lower courts had decided that where a party availed himself of the benefits of an act of Congress he had at least constructively abandoned his common law rights, and hence could not recover damages in the State courts, but must proceed in the United States courts under the act. Now when proceedings were commenced in the United States courts for damages for the infringement of a registered trade-mark, it was urged upon these courts that there was no remedy because the common law afforded ample protection, and the act of Congress had no *raison d'etre*. This reasoning, however, in either case could only be applied to those who had taken advantage of the act of Congress and registered their marks. Where parties relied upon their common law rights, the objections could not prevail. Now it appears that the act itself has been declared unconstitutional.

It was urged upon the Supreme Court, in defence of the legislation relating to trade-marks, that Congress has power to pass laws "to promote the progress of science and the useful arts by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries." The court decided that a trade-mark has no necessary connection with inventions or discoveries. It was also argued that the Constitution provides that Congress shall have power "to regulate commerce with foreign nations and among the several States and with the Indian tribes." The court declared that the legislation in question does not limit the use of trade-marks to inter-State or international commerce, as it should do if based upon the constitutional provision cited; nor does that clause of the Constitution bring within the control of Congress every species of property used in commerce.

While denying the constitutionality of legislation by Congress for the regulation of trade-marks, the court desired to leave untouched the question of the right of Congress to regulate the use of trade-marks by treaties with other nations. The United States have such treaties with several nations, and others may be made from time to time. No opinion as to the right of the Government to enter into such treaties has yet been given. It is simply affirmed that Congress has no power to pass laws for the protection of the rights of persons to the use of any particular trade-mark. The decision is important, and therefore it should be thoroughly understood.

The Secretary of the Interior, in consequence of pending applications, has issued instructions suspending action on pending applications until the desire of the applicants to proceed has been manifested; and further that "trade-marks will hereafter be registered on pending or future applications only in favor of those persons who, with full knowledge of the decision of the Supreme Court, shall request such registration. The fees heretofore paid in trade-mark cases cannot be refunded without further legislation by Congress."

THE agricultural lands of the Northern Pacific railroad west of the Missouri river, to Puget sound, are to be offered for sale to actual settlers at the Government prices, $2.50 cash per acre, with an addition thereto of 10 cents per acre to be paid to the company to reimburse it for the cost of selecting, surveying and conveying such land.

RICHARD K. EVANS, ESQ., was married to Miss Fannie Virginia Brown, in Washington City, Nov. 20th.

New Mexican Copper Mines.

Considerable apprehension is manifested by those interested in copper mining, that the development of the rich copper mines of New Mexico will practically exclude the other mines in the United States, if not most of those in the world.

One of the richest deposits is at Clifton, 93 miles almost due west from Silver City, and between 60 and 75 miles from Ralston, now possibly better known as Coronada. The ore seems almost unlimited in quantity—in fact there is a solid mountain of copper. To prove this, the first development was by tunnel at the base, and from which drifts were carried in all directions, shafts in the meantime being sunk from above the ores from the top showing fully as rich as those at the bottom.

The smelting works and attendance building are in a canyon on the Fresco river, near where it empties into the Gila. Fuel has to be brought 35 miles and costs $40 a ton, 1½ tons being required to smelt a ton of copper. Cartage to the nearest railway station at Otero costs $70 a ton, yet business is carried on at a large profit.

At Santa Rita, near Silver City, are extensive copper deposits, which have been worked for over 100 years. While yet Mexican territory these mines were worked mainly by convict labor, and at times by hired natives. The deposits are of various kinds of copper ore and native copper in the seams of the rocks. It was for the latter that mining was carried on in former years. There is an abundance of rich ors over a large district, but at present the mines are in the hands of speculators and not being worked. The extreme difficulty of getting transportation for the metal to the end of the railroad has also, no doubt, had an important bearing upon the cessation of labor upon the mines. The ores of the Santa Rita and Hanover districts adjoining are in the form of immense deposits, and, while rich, are unlimited in quantity. Further west the Burro mountains contain large deposits of copper, and still further, at Coronada, are several mines of great magnitude, of low grade ores, which cannot be worked at present for want of fuel and water. Up the valley of the Rio Grande and 18 miles east of Bernalillo, which is hardly more than 250 miles from the Colorado boundary, is the great copper district of the Puerto Westward, and beyond the territorial line into Arizona are copper deposits of much magnitude.

Melting Copper Ore in the Mine.

C. M. Tessie du Motay, the noted Parisian chemist, who has paid considerable attention to metallurgical processes, and E. Stern, of New York, have devised a somewhat curious process and apparatus for melting ores in their natural situation. Their proposition is a startling one, which practical miners will hardly believe practicable. It consists in directing against ores in their natural situation in the mine, an intensely hot flame, preferably that produced by what is known as the compound blow-pipe. The apparatus consists in the arrangement of blow-pipes for carrying out the process, namely, a series or crown of blow-pipes surrounding a central pipe, all of said pipes being arranged upon a carriage so as to be readily brought into contact with the ores in their natural situation.

This process is supposed to be particularly useful in the rendering of those masses of native copper which are too tough to be cut up by knives or blasted with powder with any economy. It is claimed by the inventors, however, to be used on other similar ores, thus avoiding the necessity of cutting or breaking them up. In this class they include native copper, sulphurets of iron and copper, higher sulphurets of iron, copper and lead, antimonial ores, etc.

The blow-pipe is composed of several crowns or series of piping supplied with a mixture of gas and air blown in the direction of the center of fusion. It is traversed by one or more air, gas and coal-dust pipes, thus concentrating the whole of the caloric power of the fire upon the zone to be melted and preventing the caloric from being dispersed, owing to its being stored in the rock to be melted.

In consequence of the injection of coal-dust in the direction of the center of fusion, no oxidation can take place, either of the metals or of the sulphureted compounds to be extracted by fire. The coal-dust may be substituted by tar, petroleum or other hydrocarbons.

A New Harness Snap.

The cut shown herewith represents the Covert harness snap, made by the Covert Manufacturing Co., of Troy, New York. It is intended as a snap for use on any part of harness where necessary. The hook is opened by drawing back the button, and on releasing it, the spring pushes the slide back up into the end of the hook so as to close it.

DISTURBANCES occurred among the students of the St. Petersburg University, resulting in several arrests and in the closing of the library by order of the Governor-General. Statements in regard to the origin of disturbances are conflicting.

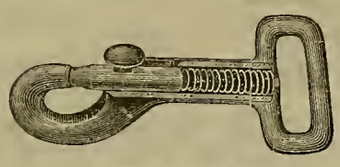
Special Mining News.

The *Herald*, published at Bonanza City, Idaho, proposes to publish a special mining edition. The editor says: "We have visited personally and made notes thereon, and the new districts that we have been unable to visit have been noted carefully by prospectors and miners acquainted with the discoveries and developments. The necessary material is now in hand, with the exception of Bay Horse, Poverty Flat, Kinnickinick and Ramshorn mines, at the southeast end of the belt, and a report from these is being made up by Judge Onderdonk and Maurice McGrath (Winnemuck) and will reach us by Monday's mail.

"The edition will be soon published, and will include the prominent mines in the Wood River, Salmon River, Yankee Fork and other mineral regions. The object of this special edition is the dissemination of knowledge regarding the mineral resources of central Idaho. The *Herald*, in common with many others, receives numerous letters from parties at a distance seeking information about our mines. To answer all these inquiries is next to impossible. Hence we have adopted this plan and will print a large extra edition of the *Herald* to send abroad. It will make a showing equal to, if not excelling, that of any other new mineral field on the continent."

With reference to this subject, we notice that a few of our exchanges are beginning to publish a complete monthly mining summary. If all papers published in our mining counties were to devote space to a complete resume of the mining interests of their respective counties, say once a month or once every two weeks, this together with daily items, would constitute a fund of information which would soon place our mining business before the world on a certain and substantial basis.

We make this suggestion to all of our exchanges, with no other object in view than to concentrate the record of our mining progress in an orderly manner. Let every miner have a hearing, every prospector a notice of his doings. To bring about a brisk revival of mining operations we must make our mines known, and specify where they may be found. Tremendous inducements in the shape of information and in regard to mineral resources are being held out to the world by adjoining States and Territories, and unless California wakes up to the fact that money exists in enormous quantities in the East and in Europe, awaiting investment in mines, other regions will secure it, or else, by their exaggerated accounts, cause capital to be diverted into other and less solid investments. It is gold that the world wants, and there never will be a glut. We have enough gold in this State to satisfy the market as much as it ever can be, but the idea of where and how it is to be worked out of our soil is so indefinite, comparatively, that nothing but full and accurate information can bring about the working of our deposits on a grand scale. It is the desire to procure this information that has prompted us to make these remarks.



The Covert Harness Snap.

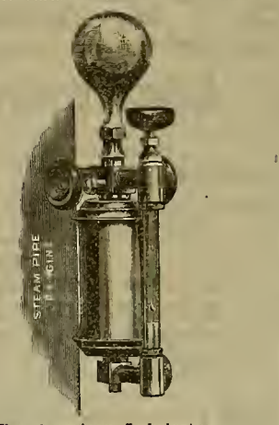
A NEW PROPELLER.—A new form of propeller recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency, by John B. Ward of this city, was tried last week on Lake Chabot, back of San Leandro. The little boat on which it was tried was built here, but the engines, boilers, etc., are of Eastern make, having been purchased at the Centennial exhibition, and presented to Mr. Chabot. The boat runs well with her present propeller, but a decided improvement in speed was made by that of Mr. Ward's invention. Over a measured distance, with 105 pounds of steam, with her own propeller, and in the morning with no wind, she made the distance in six and a half minutes. She was then hauled out and a propeller of the same diameter substituted for her own. With the new propeller she made the distance in five and a half minutes, with 70 pounds of steam and a head wind. Again the propeller was changed, this time another of the improved form, same diameter, but removable blades slightly thicker. The same distance was made in five minutes with eighty-five pounds of steam; throttle half open and forward door open. The last trial showed that a greater speed was attained with a very much lessened consumption of steam. The new propeller does not differ materially from that commonly in use, but it is constructed upon peculiar mathematical principles, so as to give the best effect. The edge resistance is much lessened, and it makes no bubbles or foam, cutting the water cleanly, and utilizing its whole power in propelling the boat ahead. Further experiments are to be tried on a larger scale, but those referred to proved the efficiency of the device to those who were present at the trial.

HORSE THIEVES are infesting Ventura county.

Columbia School of Mines.

This college established in New York City, and growing in importance as a national institution, has just issued the first number of volume one of a quarterly entitled "The School of Mines Quarterly." It is published under the auspices of the Chemical and Engineering Societies of the School of Mines, and is issued in November, January, March and May, Forty-ninth street (cor. 4th avenue), New York City, N. Y. The subscription price per year, including postage is one dollar, which price places it within the means of a numerous clientage. If the editorial staff and the contents of the first number are any criterion, there need not be any fear as to the success of the publication. We are glad to place such serials upon our exchange list, since they form a medium of communication between our growing institutions and the world at large. In times not very recent the proceedings of our societies and educational establishments were confined to the few, but the fact that nearly all are availing themselves of the printing press for the universal dissemination of knowledge, indicates a desire on the part of the public to acquire information and a consequent revival of intellectual development, as well as a disposition on the part of our colleges and scientific societies to foster that desire.

The table of contents, showing excellent original matter, is as follows: The Pedometer as a Surveying Instrument, by Prof. H. S. Munroe; Coffee and its Adulterations, by F. Weichmann; Fire Brick and Terra Cotta, by A. McL. Parker; Chloral, by A. P. Hallock; Building Stones, I, by J. L. Greenleaf; Editorial; Notes on Mineralogy and Physics, by C. A. Colton, E. M., and M. C. Ihlsing, Ph. D. We have no criticism to make for the reason that no foundation for criticism occurs to us. The sensation of "newness" and the fear of adverse criticism will always, in our judgment, have a tendency to increase the merits of this new and welcome quarterly, by inducing constant care and variety in the interesting and instructive matter to which its pages are intended to be devoted.



The American Lubricator.

WATER-RIGHT DECISION.—The Supreme Court of the United States has affirmed the judgment of the Supreme Court of California in the case of Oswald Broder vs. The Natoma Water and Mining Company. The most important question presented by the case is, whether a person who has constructed a canal or ditch for the purposes of mining or irrigation, upon the public lands of the United States, can be forced to abandon the same by another person claiming title to the lands under a subsequent Government grant made to one of the Pacific railroads. In 1866 Congress passed an act for the protection of the owners of ditches and canals constructed on the lands of the United States, and for the establishment of their rights as against subsequent grantees of the Government; but the complainant in the present case acquired title before that law was enacted, and maintains that the law should not be made retroactive in order to defeat his claims. The Court holds that the rights of owners of ditches and canals, in such cases, are rights which the Government, by its conduct, had recognized and encouraged, and was bound to protect, even before the passage of the act of 1866; and that that act was rather a voluntary recognition of a pre-existing right, constituting a valid claim to its continued use, than the establishment of a new right. It makes no difference, therefore, whether the complainant acquired title to the land in question through a Government grant to the Central Pacific Railroad Company, before or after the passage of the act of 1866. In either case, he took it subject to the right of way of the owners of the canal, tacitly or formally recognized by the Government, and that right cannot now be disturbed.

IN consequence of recent developments, the directors of one Bremen steamship company have decided to refuse transportation of their vessels to the class of heavy French silks which are so weighty with chemicals and oils as to cause danger of spontaneous combustion.

Cleopatra's Needle.

The recent difficulties concerning the obelisk which the Khedive of Egypt presented to Americans, had its origin in the natural dislike of the Egyptians to the dismantling of their country of works of art. The *Young Egypt*, published at Alexandria, in Arabic and French, expresses its sentiments in the following manner:

"America is making preparations to take away from us the sole obelisk of Cleopatra which we now possess. This news astonishes us, and we cannot believe that it is true. This monument belongs to the country, and no one can dispose of it without the authorization of the nation. If this be allowed, we may find some day that the pyramids are transformed into stone quarries and used for building houses. The time has come when more attention should be given to the preservation of our artistic wealth, and more respect accorded to the vestiges of the past, which once made Egypt glorious."

The New York *Star* some time ago published a long account of the artificial manufacture of this obelisk by an American, who was employed for the purpose by the Khedive, at the time of the donation of a similar one to England. It was alleged that the religious superstitions of the people would not permit the removal of the original, and so it was resolved to hoodwink them into the belief that an imitation obelisk would be palmed off on the English. While to the British the Khedive explained that the original would be sent to England and the imitation kept to satisfy the religious prejudices of the priests. So the American sculptor made an exact counterpart of the original, done in cement after the manner of a Portland cement pavement. Of course there is nothing fabulous in the star story. In any event it will not make much difference to New York whether the obelisk is original or a base imitation, provided it came from Egypt, it will do. We sympathize with the Egyptians in their efforts to stop the removal of their works of art. The removal of a pyramid is well suggested by *Young Egypt*. We bespeak one for the Pacific coast.

The Deepest Mine on the Continent.

On the 23d of November, says the Gold Hill *News*, the incline of the Belcher mine, on the Comstock, reached a perpendicular depth of 3,000 feet, and is 300 feet deeper than any other mine on the lode and the deepest mine on the continent. The incline starts from the 900 level and makes its plunge at such an angle as to require the incline to run about 160 feet to make 100 feet perpendicular depth; and hence stretches away about 3,360 feet. In making this depth of 2,100 feet perpendicularly, the incline carries the workings in the bottom 2,625 feet to the east of the shaft. Any one curious to know where the line of the shaft is, can therefore measure off east of the air shaft 15 feet less than a half mile. It must be somewhere east of a portion of the Twin Peaks mine and, in fact, over the hills and a great way off. They have big reels at the mine which are capable of carrying 7,000 feet of cable, but the rope in use at present is really 80 feet less than a mile long.

The Belcher is now sinking a sump, preparatory to opening the 3000 level and exploring the ore vein at that depth. The mine is in the best of order, and well ventilated, and should ore be found on the 3000 level no delays will be necessary in order to commence stoping it out. In a few days she will have pumps down that depth and in running order. Her engine can run a double column of them to that depth if necessary. It is an upright, compound condenser, with initial cylinder 30x126 inches, and expansion cylinder 62x96 inches—dimensions which are only exceeded at the Forman and the Chollar-Norcross-Savage shaft, and by the new engine being placed at the Union shaft.

The American Lubricator.

This improved lubricator, for which Tatum & Bowen, No. 3 Fremont street, are agents, has only recently been introduced on this coast, although there are upwards of 7,000 in use elsewhere. It feeds the oil into the steam pipe of the engine at a point above the throttle valve, thus infusing the steam with foam of oil, and as the lubricated steam passes through the throttle, governor, steam chest and cylinder it lubricates all those parts. Every drop of oil is visible as it passes into the steam pipe.

The lubricator, working in this way, imparts a regular motion to the engine, because it lubricates the governor valve, and the throttle is easy to turn at any time, it being kept from rusting and cutting. The friction of the valves is relieved, and the packing around the stems is oiled. The American Lubricator is made with special machinery and is interchangeable, so that any part can be duplicated by mail.

The Governor has commissioned Thomas W. Younger as First Lieutenant, and T. W. Stevens as Second Lieutenant, of the City Guard of Sacramento. Also E. E. White, Notary, Tuolumne county; W. H. Grant, Notary, Yolo county, and A. J. Kasten, Notary, Solano county.

Testing and Working Silver Ores.

The above is the title of an illustrated work of 114 pages, for miners and prospectors, by Chas. H. Aaron, which has been issued by Dewey & Co. Mr. Aaron has managed to give many useful hints and suggestions, free from all technicalitics, and in such a style as to be easily comprehended. It is written for the miner, without chemical symbols or metallurgical technicalities to confuse those who are not chemists or metallurgists. The following summary of the contents of the work will give an idea of its scope:

Under the heading of the first chapter, "Testing Ores for Silver," we find paragraphs on ore formation test for silver, with heat and water, acid or blow pipe. In speaking of testing for a process, the extent and richness of ore is considered, smelting ores, selecting and working sample, appliances for testing, roasting, etc. Under the head of "Working Ores" the author describes Aaron's process, has something to say of superheated steam, preparation of dichloride of copper and protochloride of copper, use of copper and iron, quantity of chemicals, carbonate of lime, chloride ores, amalgam, Patchen's process, etc. He also describes the methods of working roasted ores, treatment of base metals, stirring, heat of furnace, want of sulphur, etc. Under the head of "Leaching Processes" are the titles, Smelting, Mexican process, Chilean process, Kroehnke's process, etc. Under "Pulverizing Machines" are described the arastra and its construction and operation, stamp batteries, screens, Crocker's trip-hammer battery, Paul's pulverizing barrel, Kendall's battery, Noice's pulverizer, a cheap rock breaker, etc.

In speaking of amalgamators the author describes a cheap amalgamator, grinding the ore, directions for making a barrel, preventing mechanical wear, use of quicksilver, copper in bars, Freiberg barrel, cheap barrel trough, barrel on rollers, Aaron's amalgamator, separator, etc.

He describes an improvised retort, roasting furnace, furnace tools and furnace building. Among the miscellaneous mention may be found Aaron's leaching apparatus, with two or three different arrangements, a small mill, sampling tailings and settling tanks, dichloride of copper, etc. Mr. Aaron is a practical miner, of long working experience on this coast.

The book is a serviceable one for miners' and prospectors' use. Price, post free, $2.00. Address Dewey & Co., MINING AND SCIENTIFIC PRESS, 202 Sansome Street, San Francisco.

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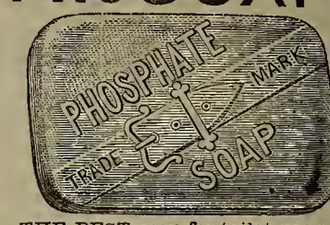

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TESTIMONIALS.

SAN JOSE, September 24, 1879.

To the Standard Soap Co.—Gentlemen:

It affords me pleasure to say to the public that I have used and prescribed your PHOSPHATE SOAP as a remedy in various forms of cutaneous diseases with the happiest results. I am of the opinion that it is the mildest and most perfect detergent that can be used, either for cleansing the skin and leaving it soft and healthy, or for removing the fetor and corroding influences of sores and ulcerations. I should be sorry to be without it in shaving my face or making my toilet, to say nothing of my good opinion of its remedial qualities.

A. J. SPENCER, M. D.

SAN FRANCISCO, Aug. 27, 1879.

Gentlemen:

I received a package of your soap (Phosphate Soap) and it gives me great pleasure to testify as to its superior excellence. As a toilet soap I have never seen anything to surpass it. It also possesses superior remedial qualities. I have used it in two cases of obstinate skin disease, one of intolerable itching, *Pruritus*, the other an *Eczema*. In both great relief was obtained. Its emollient properties are remarkable. Respectfully,

W. A. DOUGLASS, M. D.,
126 O'Farrell St.

To the Standard Soap Company.

SAN FRANCISCO, July 19, 1879.

Standard Soap Co.—Gents:

I have tried your PHOSPHATE SOAP, and have no hesitation in saying that it is the best toilet soap I ever used. My wife has used it and is of the same opinion. I have paid as high as fifty cents per cake for an article in every respect inferior to what you sell for twenty-five cents. HENRY H. LYNCH,
515 Haight street.

The genuine merits of PHOSPHATE SOAP and persistent advertising will force every druggist, groceryman and general dealer to order it by the gross sooner or later. Ask for it in every store. The retail price is 25 cents per cake. We wish to sell it only at wholesale, but in case you cannot find it we will send a nice box of three cakes by mail, postage paid, on receipt of 85 cents in stamps.

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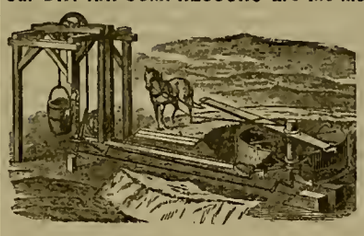

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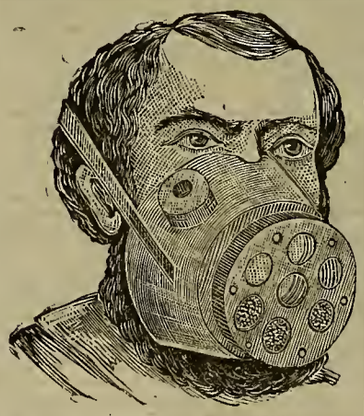

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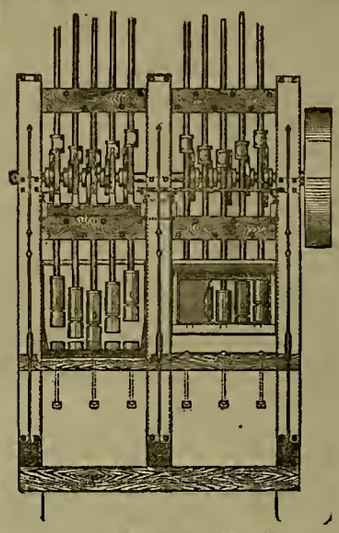

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CONTINUED FROM PAGE 341.

and prospects appear favorable. The winze on the 10th level looks first rate; in the drift we have low-grade ore that will pay well when we get the place opened up in shape. We are making all due preparations to start work on the black ledge, so as to have a good quantity of ore on hand when the furnace starts up. Mr. Kilbourne was in town last night and reports the grading for the furnace finished and is getting ready for the stone work. The mill is running smoothly and everything around the mine likewise.

SANTA FE DISTRICT.

RICH DISCOVERY.—The Esmeralda *Herald* speaks of a very rich discovery about five miles in a northerly direction from the famous Sunrise mine. The ore is a black sulphuret, galena and antimony. The rock was taken from the surface, and several assays were made, ranging from $2,200 to $2,926. The vein is 22 inches wide, and in a limestone formation. It is pronounced by old prospectors to be the greatest discovery ever known. Work will be commenced on it immediately.

ARIZONA.

SILVER PRINCE.—*Arizonan:* Mr. Curtin, who, with Hotaling, is owner in the Prince, informs us that there is now on the dump, at the mine, 100 tons of ore that will mill $100 to the ton throughout, which is a pretty good showing for any mine. But the best is not told. Three men recently took from the mine, in one day, five tons of ore worth $1,000 per ton, and there is four ft of this ore in the ledge now in sight.

COLORADO.

CLEAR CREEK COUNTY.—*Miner:* The Magnet and Sequel mines are associated properties on Saxon mountain, and are under the superintendency of E. Le Neve Foster. They have been leased by Hopkins, Withrow & Co., and are turning out profitable quantities of ore. In the lower drift there are 10 inches of nearly solid ore, in the bottom, and two streaks in the ton, one of six and one of eight inches. The largest streak at this point mills 355 ounces of silver per ton, and the smaller one from 500 to 800 ounces per ton. In addition to this there is a considerable amount of scattered mineral. A level recently commenced below this carries six inches of 350-ounce ore, and at other points in the mine there are from one to three inches of ore. Four men are employed on the property and are doing well.

IDAHO.

ITEMS.—Idaho City *World*, Nov. 18: Charles Smith discovered a mine on a line with the Last Chance, on the Yuba side of Atlanta hill, and about a mile below the summit. It is a promising mine. Two tons of ore from the Queen's river mines, worked in the Buffalo mill recently, yielded $100 per ton. The Yuba tunnel company have tapped the Atlanta mine at a depth of 1,500 ft from the surface. The tunnel is nearly 1,400 ft in length. The ore body tapped promises to be a bonanza of immense proportions. Fifty-dollar ore is now being extracted. The people of Atlanta have been anxiously waiting for the tunnel to tap the ledge, and as it is now proven good at a great depth, intense excitement prevails. It is rumored that the company will erect a mill early next spring. Good ore is being taken out of the Buffalo mine. The mill was shut down a few days ago, but will be started up again soon. The Last Chance is looking splendid and good rock is being taken out of it. Hall & Co. have struck rich ore in the shaft, but it is not yet known whether it belongs to them or the Last Chance company. A good deal of prospecting is being done in the mines around Atlanta.

YANKEE FORK.—A strike of very rich rock was made on the Charles Wain ledge a few days since. Recent developments on the Charles Dickens mine are very flattering. Good ore is found in the lower tunnel, and a very rich strike was made lately in the crosscut at the end of the old tunnel. This leaves many thousand tons of good ore in sight.

NEW MINING DISTRICT.—The *Idaho Statesman*, of Nov. 15th, publishes a letter from Hon. V. S. Anderson, from Rocky Bar, in which it is mentioned that Merrit Kelly arrived here last night. He has discovered a new mining district on Wood river, which contains a large number of ledges, one of which, a galena ledge, he says is 50 ft wide. This is an entirely new discovery, Kelly being the only person who has yet been there. The ore looks well, but no assays have yet been made. The new district is called the Black Barb, from a black-barbed Indian arrow-head which he found, and which led to the discovery. This discovery is situated on the west side of the main Wood river, and on the West Fork of that stream, between Galena City and Mineral Hill. Kelly says he has also discovered a big iron mine and some limestone. He thinks it is an important discovery, and that it will rival the other districts on Wood river. He came in to have his claims recorded, and if the weather permits he intends to return to the new district.

MONTANA.

LEXINGTON.—Butte *Weekly Miner*, Nov. 18: This mine has been pretty thoroughly prospected above the water level. There has been about 800 ft of crosscutting done, which may be called dead work. The shafts and levels have probably more than paid their expenses, being driven mostly in ore. In some of the levels the ore body is very rich, and varies from 4 to 13 ft, some of the assays going from 200 to 1,000 ounces in silver.

GAGNON MINE.—From the west drift, 150 level, they are extracting some magnificent-looking base ore. I know it is easy to grow enthusiastic over good ore, but there is a pile on the dump which shows native silver to an extent which must do the eyes of the owners of the Gagnon good.

BELLE MINE.—A breast of free ore eight ft wide has been struck in the west drift of shaft No. 2; eight tons of free and five tons of base ore per day.

NEW MEXICO.

GRANT COUNTY.—The *New Mexican Herald*, speaking of the minerals of this county, says: J. G. Mahany, who has large experience in mining and with mining men, recently returned from an extended trip through the mining camps of Arizona. With the exception of two deposits in the Tombstone district, our neighboring Territory is in no wise superior to Grant county, either in point of deposit, richness of ore, supply of wood and water or natural advantages for successful mining operations.

NEW DISTRICT.—Shakespeare is the name of a new mining district recently opened in the northwestern portion of New Mexico, close to the line of Arizona. The main ledge of the district crops from 30 to 40 ft above the surface, and can be traced for miles, and the top ores yield from 100 to 200 ounces of silver per ton. The district is coming into notice, and the inevitable newspaper, which always follows upon the heels of the prospector, is to make its appearance shortly. The district will be traversed by the Atchinson & Santa Fe and the Southern Pacific railroads, both of which are in process of rapid construction.

OREGON.

ITEMS.—Jacksonville *Sentinel*, Nov. 19: Piping commenced at the Eckleson & Hamilton mining claim, on Applegate, last Monday, with every prospect of success. Magruder & Hays last week received 600 ft of 11-inch pipe for their mine on Rogue river. The pipe is now being put in position. Sturges & Beckner commenced ground-sluicing at their mines on the 10th inst. Last season they did not get to work till the 1st of March. J. H. Hyzer, Sanford Carter and John Gale discovered a rich gold-bearing quartz ledge in the vicinity of the Squaw Lake mines last week, which prospects well. The Grave Creek ditch and mining company have their ditch about completed and will be ready for work in a short time. The late rains have furnished water enough to start some of the mines in this section providing our miners had been prepared for it. It was not expected so soon, however, and did no good. At the quartz mine in the Willow Springs district, owned by parties living in Portland, silver ore was discovered one day last week, assaying about $6 per ton. A thorough prospect of this ledge is now being made.

COAL BED.—Mr. J. C. Callahan, of Coos Valley, Douglas county, has found a coal bed; the vein six ft in thickness at a depth of 49 ft. The Roseburg *Independent* says that this discovery proves what has frequently been claimed, that under the entire valley of Umpqua there is an inexhaustible coal bed.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

CANS FOR HERMETICALLY SEALED GOODS.—Charles C. Lane, New Westminster, B. C., patented Nov. 11th, 1879, No. 221,468. In the ordinary process of sealing the cans after their contents have been put in, the flange or rim of the cans is crimped against the side of the can, and the can then rolled through the mechanical soldering-bath. This is simply a bath of melted solder, and by passing the can through it, the top or cover, and sides of the can are joined by the solder. Difficulty is, however, experienced in sealing the whole rim, as, while the can is being rolled, air which is displaced or expanded inside, is apt to come through the space around the rim of the cover, thus forming blow-holes, and that place where the air comes through will not be soldered, but will remain open. All cans which have this occur to them, have their contents spoiled, not being hermetically sealed. The object of this invention is to overcome this obstacle to perfect sealing. To do this, a supplemental inner cover is formed which is corrugated or crimped radially and has a depression at its center into which the corrugations or grooves lead. This supplemental inner cover is laid into the can after filling, or, if desired, it may be attached to the outer cover, which has its rim crimped on the can in the usual way and in the center is formed a small hole. This small hole is made immediately over the depression in the supplemental cover, and as the grooves or corrugations all center at this depression, any air which may be in the can during the process of soldering, instead of escaping through the rim, will be directed toward the center and escape through the hole. The rim is accordingly always thoroughly soldered, there being no air to blow through the soft solder. As soon as the can is removed from the bath, a small piece of solder is put over the hole in the cover, and the can is thus hermetically sealed.

PARLOR MANTEL GRATES.—John L. Tussler and William H. Loomis, Alameda, Cal. Patented Nov. 18th, 1879. No. 221,756. It is well known that in grates of ordinary construction it is found impossible to keep the fuel at the farther sides of the grates in a state of combustion, and that the fire is usually brightest and best in the center. It is customary, therefore, to put in fire bricks or loose brick of any kind at the two sides of the grate, so that the fuel will be confined to the center, where it will burn. The flanges formed in this grate do away with the necessity of plating bricks in the grate by confining the fire to the center, keeping out the cold air from the corners and directing the fuel to the center of the fire-place. This invention consists in the use of a peculiarly formed basket having side curved flanges and a peculiarly closed front, whereby the fire is confined to the central portion of the grate and the fuel is directed toward the center. It also consists in the employment of a cooking attachment, secured to the grate and made removable, provided with a hole or plate, by means of which ordinary cooking operations may be performed.

FINGER RINGS.—Charles M. Halsey, 131 Kearny street, San Francisco. Patented Nov. 18th, 1879, No. 221,728. In the construction of this ring an outer perforated ring is provided with a milled edge or flange, and an inner ring having characters upon it and a milled edge or flange, the edge of one of said rings having a tent or lug which fits into a groove in the edge adjacent to the milled flange of the other, for securing them together. Different designs or combinations of letters may be engraved on the inner ring, which will all show through the openings or slots in the outer one, as it is turned one way or another, one design showing at one time and another at another, as the outer ring is turned.

ORE REDUCING AND PULVERIZING APPARATUS. Wm. Bruckner, San Francisco. Patented Nov. 18th, 1879. No. 221,773. This invention relates to that class of ore pulverizers in which the ore is placed in a drum or cylinder and crushed by metal balls passing over it as the drum revolves, and consists, first, in providing a pulverizing barrel with a grate, said grate being connected with a conveyor so arranged along the circumference of the barrel that in every revolution of the latter the ore, after being ground between iron balls, passes through the grate out of the barrel into the conveyor, by means of which it is conducted over a screen, and the coarser ore which will not pass the screen is thence returned into the barrel.

VALVE FOR WATER CLOSETS.—Thomas Hennessy, Oakland, Cal. Patented Nov. 18th, 1879. No. 221,816. This invention relates to certain improvements in valves for water closets, basins and other purposes, and it consists in a novel construction of the valve, whereby it may be made extremely light, so as to act quickly, and at the same time it will resist the blows caused by the force of the water, which otherwise will indent and bruise it so as to render it useless.

Decisions in Patent Cases, Etc.

Schillinger vs. Gunther.

U. S. Circuit Court, Southern District of New York. Decided Aug. 26th, 1879. Blatchford, J.:

1. A disclaimer may embrace subject-matter set up for the first time without right in the reissue patent; and it may apply not only to the invalid claim, but to statements in the body of the specification upon which the invalid claim or part of claim is founded. The reissued specification is to be thereafter read as if the disclaimer were incorporated in it.

2. Where the statements in the specification and claim of the reissue patent which the disclaimer seeks to modify were mistakes in fact, and were founded upon experiments made after the date of the original patent: *Held*, that the disclaimer was lawful both to remedy the misstatements and to save the reissue from impeachment as for a different invention, it appearing that the inventor had acted throughout in good faith.

The defenses set up are overruled as not sustained by evidence, and a decree to that effect will be entered.

Williams vs. The Boston and Albany Railroad Co.

Northern District of New York. Wallace, J.:

1. Although the subordinate combinations will not produce a useful result without the addition of other parts necessary to make the complete article (a locomotive lamp), they are nevertheless sufficient to sustain the patent, because, by their co-operation, they contribute to a new result, and may be used in conjunction with such other parts as are ordinarily employed in locomotive headlights.

2. Alleged anticipations of a patented combination must show not merely the devices or elements themselves, but show them constructed and arranged substantially as in the patent, and having the same mode of operation.

3. Where the defendant employs all the parts in combination covered by the claims of the patent, infringement is not escaped, because others are employed in addition.

4. Mere delay in bringing suit for infringement is not sufficient to establish an abandonment or dedication of the patent. There must be an acquiescence in the appropriation of the right of such character as reasonably to induce the belief that the owner intended to relinquish it to the public use.

Inasmuch as complainant's patent has expired since the bill was filed, the decree will be for an accounting only.

COMMISSIONER'S DECISIONS.

Ex-parte Hogan—Water Closets.

Interlocutory appeal from Primary Examiner.

Decided Aug. 26th, 1879.

Distinct independent inventions cannot be joined, but distinct dependent inventions may, under certain circumstances, be joined in the same application.

The decision of the Primary Examiner is affirmed.

Rogers vs. Bear—Telegraphy.

Motion to re-open the interference.

Decided August 26th, 1879.

A motion for a rehearing will not be granted on the ground of newly-discovered evidence, unless due diligence shall have been shown in procuring the testimony. The motion is denied, without prejudice.

Thomas vs. Gutman.

Decided Aug. 26th, 1879. Interlocutory appeal. Corsets:

An issue declared in the following words, "A corset having the abdominal portion provided with incased transverse bones extending from the busks to longitudinally arranged incased bones," is ambiguous, because it is equally applicable whether there are several longitudinal bones or only one on each half of the article.

Kenerson vs. Brown and Brown.

Decided Aug. 26th, 1879. Interlocutory appeal from the Examiner of Interferences. Manufacture of wire:

Where a party to an interference, having failed to examine a witness produced by himself, whose name was not included in the list of witnesses furnished to the opposite party, because the opposite party left the place of examination, moved for an extension of time for taking testimony, in order to take the testimony of such witness, and on an appeal from a decision of the Examiner of Interferences granting the motion, the other party denied the materiality of the proposed testimony, it is ordered that additional time should not be granted, unless the opposite party should, in rebuttal, attempt to controvert the same testimony previously given by other witnesses; but that in such case a reasonable time should be assigned for supporting such testimony by additional proof.

The order of the Examiner of Interferences is modified accordingly.

Ex-parte Wiard et al.

Decided Aug. 26th, 1879. Appeal from Examiners-in-Chief. Plows:

1. The difference between an open web of diagonal bars in a plow-beam, and web of diagonal bars connected by thin plates, is not patentable.

2. A claim for a plow-beam with an open web of diagonal bars of malleable iron is anticipated by a prior patent for a plow-beam with a web of diagonal bars connected by thin plates, the patentee having designated steel, cast iron and malleable iron in his original specification, and steel alone in his amended specification, as the material of the manufacture.

The decision of the Examiners-in-Chief is affirmed.

ACTING COMMISSIONER'S DECISIONS.

Richmond vs. Hibbard—Feather Dusters.

Motion to re-open Interference.

Decided September 4th, 1879.

1. Order to show cause why an interference should not be redeclared after final judgment rendered, and patent issued, granted on *ex-parte* motion of the defeated applicant, sustained by affidavits of witnesses setting forth newly discovered and material testimony opposed to previous findings in this case.

2. On final hearing of said order, at which all parties in interest were present, the allegations of the affiants in behalf of the moving party not being disproved or weakened by the counter-affidavits submitted, the motion was sustained, and a new interference between said application and the patent directed to be declared.

To that end a declaration of a new interference between the said application of Gilbert M. Richmond and said patent of Susan M. Hibbard is ordered.

Ex-parte Pace, Talbot & Co.—Trade-mark.

Appeal from Examiner.

Decided September 17th, 1879.

1. The name "Bayard," a portrait of a United States Senator by that name, held to be proper matter for a trade mark in chewing tobacco.

2. Any proper word or phrase, whether the name of a person, firm, or corporation, or a geographical term, may be registered as a trade-mark, unless the same is descriptive of the quality of the goods, or is the name of the applicant or manufacturer, or place of manufacture, or is deceptive.

3. The name of the applicant or firm manufacturing the goods cannot be registered as an essential part of the mark.

In conclusion, it is held that the name sought to be registered by applicants is an entirely fanciful and arbitrary designation, and a proper subject of a trade-mark, but the name of the firm must not be represented as constituting an essential part thereof.

Long vs. Welsh—Trade-mark.

Appeal from the Examiner.

Decided September 19th, 1879.

1. A concession of priority of adoption, use, and right of a trademark amounts to an acknowledgment of ownership by the one giving it in the one to whom it is given.

2. When one who has obtained the registration of a trademark for an entire class of merchandise is found to be the proprietor of the mark for part only of the class, it would seem that his registration was void, in view of the doctrine of *Smith* vs. *Reynolds*.

3. Different persons may apply for the same mark to different kinds of goods in the same class, provided their nature and resemblance are not so nearly the same as that the identity of the trade-mark would deceive the public as to origin or ownership.

4. Where the registered trade-mark covered the class of manufactured tobacco broadly, and the latter applicant confined his application to plug tobacco, the declaration, as to other interference cases, should have been confined to the issue made by the later applicant.

5. If there is not sufficient distinction between fine-cut chewing tobacco and plug tobacco to justify registration of the same mark for both kinds by different parties, then a concession of adoption for plug tobacco would be an acknowledgment of ownership of the mark on chewing tobacco.

Examiner's decision reversed.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Hillside, Nov. 22d, $3,000; Northern Belle, Nov. 19th, $5,843.14; Christy, Nov. 24th, $6,201; Hillside, Nov. 25th, $3,500; Northern Belle, Nov. 22d, $8,811.73.

CHINESE MINERS.—The *Silver State*, published at Winnemucca, Nevada, contained, a few days ago, an item with reference to the number of Chinamen engaged at placer mining in the northern part of Humboldt county. It says: At Willow Creek there are some 25 of them at work, and there are 47 at Flat Creek. Occasionally they send 10 or 12 ounces of gold dust here by white men, but it is thought that what they send by the whites is only a small portion of what they take out. They think that if the whites knew that they were making big wages, there would be a rush to the mines, and the whites would locate what they believed to be the best part of the diggings; consequently they do not tell how much gold they get out or how rich the mines are.

A PATENT was issued November 24th for El Rincon Rancho, comprising 4,431 acres in San Bernardino county, Bernardo Yerba confirmee.

QUITE a heavy snowstorm prevailed at Augusta, Ga., on the 19th.

News in Brief.

THE Czar of Russia is in Berlin.

THE Sheffield iron trade continues to improve.

GENERAL GRANT has arrived home in Galena.

CALIFORNIA wheat in Liverpool 10s. 7d.@11s. 5d.

THE Irish agitation is assuming a serious aspect.

WALKING match iago bas reached Portland, Oregon.

THE disorders in Cabul are attributed to Russian intrigue.

THE Ute Commission is regarded as a failure by military men.

THE question of reforms in Cuba is causing trouble in Spain.

THE revolutionists are besieging the capital of San Domingo.

THE Countess De Montiga, mother of ex-Empress Eugenie, is dead.

The town of Farmington, Minnesota, has been nearly obliterated by fire.

THE Indians have disappoared from the vicinity of the White River Agency.

GLADSTONE has received a tremendous reception from the Liberals at Edinburgh.

CHOLERA in Japan is virtually at an end. It has proved to be an awful visitation.

FRESH troubles are reported as occurring on the El Sobranto ranch, in Ticis valley.

THE insurgents in the province of Santa Clara, Cuba, have been defeated by the Spaniards.

IN London, United States bonds are selling as follows: 5's, 105½; 4's, 106⅝; 4½'s, 108⅝. Consols, 98⅛.

SPECIAL dispatches from Cape Town report that the attitude of the Boers is very threatening.

THE ship *Columbus*, 1,853 tons, has been chartered to load at New York for San Francisco in Simonson & Howes' line, to follow the *Glory of the Seas*.

THE complaint of the Government, re-echoed by the Japanese press, is that imports exceed exports so largely that foreign trade is really injurious to the country.

THE official copy of the constitution of the State of Kentucky has been lost or mislaid, and important decisions have been rendered by a court constituted under a bogus one.

A WASHINGTON special revives the rumor that Ramsey, of Minnesota, will be appointed Secretary of War, and states that McCrary will be appointed to the bench, at his own request.

AT the opening of the London wool sales the attendance was large and the bidding very spirited. The sales show an advance of 10% on Merinos, and 17% on cross-bred wools.

REED & SONS, of Chicago, representatives of several Eastern music houses, are reported as having failed. Their liabilities are said to be $134,000, and assets $167,000, chiefly in real estate.

GENERAL GRANT has written to Admiral Ammen that he will meet parties interested in an inter-oceanic canal December 17th, in Philadelphia, and decide the question of the acceptance of the Presidency.

THE police of Copenhagen have arrested a student upon a charge of writing to the Queen of Sweden, demanding 2,000 crowns, and threatening in case of refusal to assassinate the Crown Prince of Sweden.

THE rumors of an impending outbreak between China and Japan continue. Both countries are well prepared for war. They only want a master mind fit to organize plans and take supreme command. It is openly said that China and Russia, have made a compact with each other in special view of war at an early date.

PUT YOUR trade-marks over your goods, you who have them; and you who have them not design and procure one as soon as possible. A good trade-mark, once recognized and well known, is a fortune in itself. People get accustomed to buying goods of that special brand, and will take no other. Display your trade-marks with your wares. It is like meeting a friend to see a familiar trade-mark. Dewey & Co.'s SCIENTIFIC PRESS Agency, San Francisco, is the place to apply for United States patent trade-marks and other patents, caveats, etc.

FRESH attractions are constantly added to **Woodward's Gardens**, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

INVENTORS, and others interested, will receive DEWEY & Co.'s MINING AND SCIENTIFIC PRESS PATENT AGENCY Circular free on application at this office. It contains 42 pages of hints and information about Patents, Patent Laws, Patent Office Regulations, and how to obtain valid patents.

HOW TO STOP THIS PAPER.—It is not a hereulean task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

EXTRA COPIES can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

Chew JACKSON'S BEST Sweet Navy Tobacco

A Library for Inventors.

We have at our patent offices, No. 202 Sansome street corner Pine, a complete set of Patent Office reports, containing engravings and claims of EVERY PATENT ever issued in the United States.

We have also a complete set of the MONTHLY VOLUMES issued by the Department, with full detailed description and large drawings of all the patents issued since the time when these volumes were first published.

A set of all the LAW BOOKS ON PATENTS is also on our shelves ready for reference. We have also the British Commissioners reports, Canadian Patent Office reports for all British North America, full files of MINING AND SCIENTIFIC PRESS, PACIFIC RURAL PRESS, *Scientific American*, *Scientific American* supplement, *American Artisan* and other American and foreign scientific and mechanical journals, as well as mechanical dictionaries, chemistries, encyclopedias, and other works of reference.

Inventors and patentees are WELCOME TO EXAMINE at their leisure any of the books in the above sets, and we shall be glad to give them any assistance in hunting up what they want.

Our library is the most complete of its kind on the Pacific Coast in every respect, and we are continually adding to it as occasion demands.

DEWEY & CO.,
Patent Agents and Publishers,
No. 202 Sansome street, corner Pine, San Francisco

Back Numbers Wanted.

The following volumes and single copies of the MINING AND SCIENTIFIC PRESS are wanted at this office, for which a reasonable price is offered:

Year.	Volume.	
1870	20	2 Complete volumes, 1st half (of year).
1870	20	2 Copies of No. 2, Jan. 1st.
1870	20	1 Copy each of No. 1, Jan 1st, 3 of Jan. 14th, 7 Feb. 11th, 6 Feb. 4th.
1870	21	1 Copy of No. 7, August 13th.
1871	22	6 Copies of No. 1, Jan. 7th.
1871	22	3 Copies of No. 5, Feb. 4th.
1871	22	1 Copy of No. 3, Jan. 21st, 0 of Feb. 2d, and 1 of May 1st.
1871	23	1 Copy of No. 2, July 15th, and 0 Sept. 2d.
1872	24	2 Copies of No. 4, Jan. 27th.
1872	24	3 Copies of No. 7, Feb. 17th.
1872	24	2 Copies of No. 17, April 27th.
1872	25	1 Copy of No. 10.
1872	25	1 Complete volume, last half (of year).
1873	26	3 Copies of No. 8, Feb. 22d.
1873	26	3 Copies of No. 0, March 1st.
1873	26	2 Copies of No. 10, March 8th.
1873	26	1 Copy of No. 7, Feb. 15th.
1873	27	3 Copies of No. 20, Nov. 15th.
1873	27	4 Copies of No. 21, Nov. 22d.
1873	27	3 Copies of No. 24, Dec. 13th.
1875	30	1 Copy of No. 4, Jan. 23rd.
1875	30	1 Copy of No. 6, Jan. 30th.
1875	30	1 Copy of No. 8, Feb. 20th.

OUR AGENTS.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. L. THARP—San Francisco.
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H. E. HALLETT—Los Angeles County.
T. H. ORGAN—Alameda county.

METALS.

[WHOLESALE.
TUESDAY M., November 25, 1879.

IRON.—	
American Pig, soft, ton	28 00 @35 00
Scotch Pig, ton	26 00 @30 00
American White Pig, ton	25 00 @— —
Oregon Pig, ton	28 00 @35 00
Refined Bar	4 @ 8
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 8
Norway, according to thickness	7 @ 8
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @ —
TIN PLATES.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb, less than cask	9½@— 10
NAILS.—	
Assorted sizes	3 50@4 50

LUMBER.

TUESDAY M., November 25, 1870.

CARGO PRICES OF REDWOOD.		REDWOOD. RETAIL PRICE.	
Rough, M	12 00	Rough, M	15 00
Rustic	18 00	Pickets, Rough	15 00
do, No. 2	14 00	Pointed	16 00
Flooring	20 00	Fancy	22 50
do, No. 2	13 00	Siding	20 50
Beaded Flooring	23 00	Surfaced & Long Beaded	30 00
Refuse	13 00	Flooring	25 00
Half-inch Siding	16 00	do, No. 2	17 00
Refuse	14 00	Rustic, No. 1	25 00
Half-inch Surfaced	20 00	do, No. 2	18 00
Refuse	14 00	Battens, lineal ft	
Half-inch Battens	16 00	Shingles M	2 00
Pickets, Rough	11 00	**PUGET SOUND PINE** RETAIL PRICE.	
Rough, Pointed	12 50	Rough, M	18 00
Fancy, Pointed	18 00	Fencing	18 00
Shingles	1 75	Laths	3 50

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & CO.]

SAN FRANCISCO, November 25, 3 P. M.

SILVER, ½ par.
GOLD BARS, 890@910. SILVER BARS, 10@18 ⅌ cent. discount.
EXCHANGE on New York, 20, on London bankers, 49½@49¾. Commercial, 50; Paris, five francs ⅌ dollar; Mexican dollars, 93@95.
LONDON Consols, 98 1-16; Bonds (4%), 106⅝
QUICKSILVER in S. F., by the flask, ⅌ lb, 37@38c.

GENERAL MERCHANDISE.

[WHOLESALE.]
TUESDAY M., November 25, 1879.

CANDLES.	
Crystal Wax	17 @17½
Eagle	12 @—
Patent Sperm	30@—
CANNED GOODS.	
Assorted Pie Fruits, 2½ lb cans	2 25 @ —
Table do	3 50 @ —
Jams and Jellies	3 75 @ —
Pickles, ½ gal	3 25 @ —
Sardines, qr box	1 67½@1 90
Hf Boxes	2 50 @2 75
Merry, Paull & Co.'s.	
Preserved Beef, 2 lb. doz	3 75 @4 00
do Beef, 4 lb. doz	6 50 @ —
Preserved Mutton, 2 lb. doz	3 75 @ —
Beef Tongue	6 50 @ —
Preserved Ham, 2 lb. doz	6 50 @ —
Deviled Ham, 1 lb. doz	5 50 @ —
do Ham, ½ lb. doz	3 00 @ —
Boneless Pigs Feet, 3 lbs	4 50 @ —
2 lbs	3 75 @ —
Spiced Fillets, 2 lbs	4 25 @ —
Head Cheese, 3 lbs	4 25 @ —
COAL—Jobbing.	
Australian, ton	6 50 @ 7 50
Coos Bay	— @ 5 50
Bellingham Bay	— @— —
Seattle	5 50 @ 6 00
Cumberland	13 00 @15 00
Mt Diablo	4 75 @ 5 75
Lehigh	11 50 @12 00
Liverpool	6 00 @ 6 50
West Hartley	— @ 8 00
Scotch	— @ 8 00
Scranton	— @— —
Vancouver Id	7 50 @— —
Wellington	— @ 7 00
Charcoal, sack	75 @— —
Coke, bush	60 @— —
COFFEE.	
Sandwich Id, lb	— @— —
Costa Rica	16 @ 16½
Guatemala	16 @ 16½
Java	25 @— 28
Manila	17 @— —
Ground, in cs	25 @— —
FISH.	
Sac'to Dry Cod	2¾@ —
do in cases	3¼@ —
Eastern Cod	— @— —
Salmon, bbls	7 00 @ 7 50
Hf bbls	3 50 @ 4 00
1 lb cans	1 40 @ 1 50
Pkld Cod, bbls	— @— —
Hf bbls	— @— —
Mackerel, No. 1, Hf Bbls	9 50 @10 00
In Kits	3 00 @ 3 25
Ex Mess	3 50 @ 3 75
Pkld Herring, bx	3 00 @ 3 50
Boston Smkd H'g	50 @— —
LIME, Etc.	
Plaster, Golden Gate Mills	3 00 @ 3 25
Land Plaster, ton	10 00 @12 50
Lime, Sta Cruz, bbl	1 26 @ 1 50
Cement, Rosendale	2 00 @ 2 25
Portland	4 00 @ 4 50
NAILS.	
Assted sizes, keg	4 25 @ 4 75

Pacific Glue Co's Neatsfoot, No 1	1 00 @ 90
Castor, No 1	1 30 @ —
do, No. 2	1 20 @ —
Baker's A A	— @1 30
Olive, Plagulot	5 25 @5 75
Possel	4 75 @5 25
Palm, lb	9 @ —
Linseed, Raw, bbl	85 @ —
Boiled	90 @ —
Cocoanut	60 @ —
China nut, cs	7½ @ 7½
Sperm	1 40 @ —
Coast Whales	35 @ 45
Polar	— @ 45
Lard	80 @ 90
Oleophine	— @ —
Devoe's Brll't	16 @ 17½
Photolite	— @ —
Nonpariel	— @ —
Eureka	19 @ 20
Barrel kerosene	20 @ —
Downer Ker	30 @ —
Elaine	34½@ —
PAINTS.	
Pure White Lead	8 @ 8½
Whiting	1½@ —
Putty	4 @ 5
Chalk	1½@ —
Paris White	2½@ —
Ochre	3½@ —
Venetian Red	3½@ —
Averill Mixed Paint, gal. White & tints	2 00 @2 40
Green, Blue & Ch Yellow	3 00 @3 50
Light Red	3 00 @3 50
Metallic Roof	1 30 @1 60
RICE.	
China, Mixed, lb	4½@ —
Hawaiian	6½@ —
SALT.	
Cal. Bay, ton	17 00 @24 00
Common	10 00 @12 00
Carmen Id	12 00 @25 00
Liverpool fine	18 00 @— —
SOAP.	
Castile, lb	8 @ 15
Common brands	4½@ 6
Fancy brands	7 @ 8
SPICES.	
Cloves, lb	47½@ 50
Cassia	19 @ —
Nutmegs	97½@1 10
Pepper Grain	14 @ 15
Pimento	19 @ 20
Mustard, Cal., ½ lb glass	— @1 25
SUGAR, ETC.	
Cal. Cube, lb	— @ 14
Powdered	— @ 14½
Fine crushed	— @ 14
Granulated	— @ 13½
Golden C	— @ 12½
Cal. Syrup, kgs	70 @ —
Hawaiian Molasses	18 @ 25
TEA.	
Young Hyson, Moyune, etc	40 @ 65
Country pckd Gunpowder & Imperial	35 @ 75
Hyson	30 @ 35
Fooo-Chow O	27½@ 32½
Japan, 1st quality	40 @ 60
2d quality	25 @ 40

LEATHER.

[WHOLESALE.]
TUESDAY, M., November 25, 1879.

Sole Leather, heavy, lb	22 @ 29
Light	20 @ 24
Jodot, 8 Kil, doz	48 00 @56 34
11 to 13 Kil	46 00 @57 00
14 to 19 Kil	61 00 @73 00
Second Choice, 11 to 16 Kil	55 00 @70 00
Cornellian, 12 to 16 Kil	57 00 @67 00
Females, 12 to 13 Kil	63 00 @67 00
14 to 16 Kil	71 00 @76 00
Simon Ullmo, Females, 12 to 13 Kil	58 00 @62 50
14 to 15 Kil	66 00 @70 00
16 to 17 Kil	72 00 @74 00
Simon, 18 Kil	61 00 @63 00
20 Kil	65 00 @67 00
24 Kil	72 00 @74 00
Robert Calf, 7 and 9 Kil	35 00 @40 00
Kips, French, lb	1 00 @ 1 35
Cal. doz	40 00 @60 00
French Sheep, all colors	8 00 @15 00
Eastern Calf for Backs, lb	1 00 @ 1 25
Sheep Roans for Topping, all colors, doz	9 00 @13 00
For Linings	5 50 @10 50
al. Russet Sheep Linings	1 75 @ 4 50
oot Logs, French Calf, pair	4 00 @— —
RGood French Calf	4 00 @ 4 75
Best Jodot Calf	5 00 @ 5 25
Leather, Harness, lb	35 @ 37½
Fair Bridle, doz	48 10 @72 00
Skirting, lb	33 @ 37
Welt, doz	30 00 @50 00
Buff, lb	15 @ 17
Wax Side	15 @ 17

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending November 25, 1879.

HIGHEST AND LOWEST BAROMETER.						
Nov. 19	Nov. 20	Nov. 21	Nov 22	Nov. 23	Nov. 24	Nov. 25
30.351	30.286	30.194	30.135	30.128	30.165	30.057
30.275	30.185	30.099	30.060	30.085	30.102	29.000
MAXIMUM AND MINIMUM THERMOMETER.						
62	63	63	63	01	60	54
49	60	49	49	47	47	48
MEAN DAILY HUMIDITY.						
62	56.7	61.7	60	67.3	71.7	79.3
PREVAILING WIND.						
N	N	N	N	N	N	NE
WIND—MILES TRAVELED.						
60	156	130	84	136	93	158
STATE OF WEATHER.						
Clear.	Clear.	Clear.	Clear.	Clear.	Clear.	Fair.
RAINFALL IN TWENTY-FOUR HOURS.						

Total rain during the season, from July 1, 1879. 2.60 in.

POSTPONEMENT.

Diana Mining Company.

The day of delinquency of the above assessment is postponed to November 17th, 1870, and the day of sale to Friday, the Fifth day of December, 1879. By order of the Board of Trustees.

J. T. MCGEOGHEHAN, Secretary.
Office, 318 Pine St., rooms 13 and 14, San Francisco.

Mining and Other Companies.

Persone interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Alpha Hydraulic Gravel Mining Company.

Location of principal place of business, San Francisco, California. Location of works, Washington Township, Nevada County, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the Second day of October, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
Alexander Girvin	8	1000	890 00
Mrs. Catharine Girvin	9	1000	200 00
Thomas Redmayne, Trustee	3	500	100 00

And in accordance with law and an order of the Board of Directors, made on the second day of October, 1879, so many shares of each parcel of said stock as may be necessary will be sold at public auction at the office of the company, 216 Sansome street, San Francisco, Cal., on the Thirteenth day of December, 1879, at the hour of one o'clock P. M of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

JAMES IRELAND, Secretary.
Office, No. 216 Sansome street, San Francisco, Cal.

Butte Hydraulic Mining Company.—Principal

place of business, San Francisco, California. Location of works, Butte county, California

Notice is hereby given, that at a meeting of the Board of Directors, held on the 31st day of October, 1879, an assessment of Ten Dollars per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary, at room 3, No. 220 Sansome street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 2nd day of December, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the Twenty-second day of December, 1879, to pay the delinquent assessment, together with the cost of advertising and expenses of sale.

L. L. DENNERY, Secretary.
Office, Room 3, No. 220 Sansome st., S. F., Cal.

Cataract and Wide West Hydraulic Gravel

Mining Company. Principal place of business, San Francisco, California. Location of works, Eho Mining District, Calaveras County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 15th day of November, 1879, an assessment of Twenty five cents (25 cts.) per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary at 26½ Kearny street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on Monday, the 22d day of December, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 12th day of January, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

WM. B. LAKE, Secretary.
Office, 26½ Kearny Street, San Francisco, Cal.

Land Purchasers' Association.—Location

of principal place of business, San Francisco, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 5th day of November, 1879, an assessment of six dollars ($6) per share (being the balance of the 43d installment on the subscription to the stock), was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at No. 641 Sacramento street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 4th day of December, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Saturday, the Third (3d) day of January, 1880, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors. C. S. WRIGHT, Secretary.
No. 641 Sacramento street, San Francisco, Cal.

Numa Mining Company.—Principal Place

of business, San Francisco, California. Location of works, Humboldt County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 23rd day of October, 1879, an assessment (No. 2) of Two Cents (2) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 328 Montgomery St., room 21, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 24th day of November, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 15th day of December, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

DAVID WILDER, Secretary.
Office, 328 Montgomery St., Room 21, San Francisco, Cal.

POSTPONEMENT.—The day of delinquency of the above assessment is postponed to December 22nd, 1879, and the day of sale to January 12th, 1880. By order of the Board of Trustees. DAVID WILDER, Secretary.
Room 21, 328 Montgomery street, San Francisco.

Annual Meeting.—Office of the Godfrey

Gravel Mining Company.

NOTICE.—The annual meeting of the above named company will be held at the office of the company, 309 California street, rooms 3 and 4, second floor, on Monday, the 1st day of December, 1879, at 2 o'clock P. M. of said day, for the election of a Board of Directors, and such other business as may come before said meeting. Transfer books will be closed on Saturday, 22d day of November, 1870, at 12 o'clock M.

J. M. BUFFINGTON, Secretary.
D. H. TWING, President.

Copp's Hand-Book of Mining Laws.

Henry N. Copp's hand-book of mining laws, just issued, contains the United States mining laws and instructions thereunder, a digest of decisions, forms, list of mining patents issued, etc. The digest of decisions alone is a very valuable thing, giving, as it does, in brief form, all the decisions of the Secretary of the Interior and Commissioner of the General Land Office in relation to mining matters. These are all under proper headings for easy reference. Forms are given for notice of location, proof of labor, notice of forfeiture, miners' lien, application for survey, patent, etc., affidavit of improvements, etc. There is also a list of patents issued for mining claims from July 26th, 1866, to August 1st, 1877. The book is of pocket size and very convenient for all who are interested in mines. It will be sent post-paid for $1, on application to Dewey & Co., 202 Sansome street, San Francisco

RED CROSS OIL!

The Safest and Most Reliable Illuminating Oil. Water White and High Test. Brilliant, Pure and Economical.

C. T. RAYNOLDS & CO., Sole Agents, No 9 Front Street, San Francisco.

Iron and Machine Works.

THOS. PENDERGAST. HENRY S. SMITH.

ÆTNA IRON WORKS,

MANUFACTURERS OF

IRON CASTINGS and MACHINERY

OF ALL KINDS.

Fremont Street, Bet. Howard and Folsom,

SAN FRANCISCO.

UNION IRON WORKS,

SACRAMENTO, CAL.

ROOT, NEILSON & CO.,

MANUFACTURERS OF

STEAM ENGINES, BOILERS AND ALL

Kinds of Machinery for Mining Purposes.

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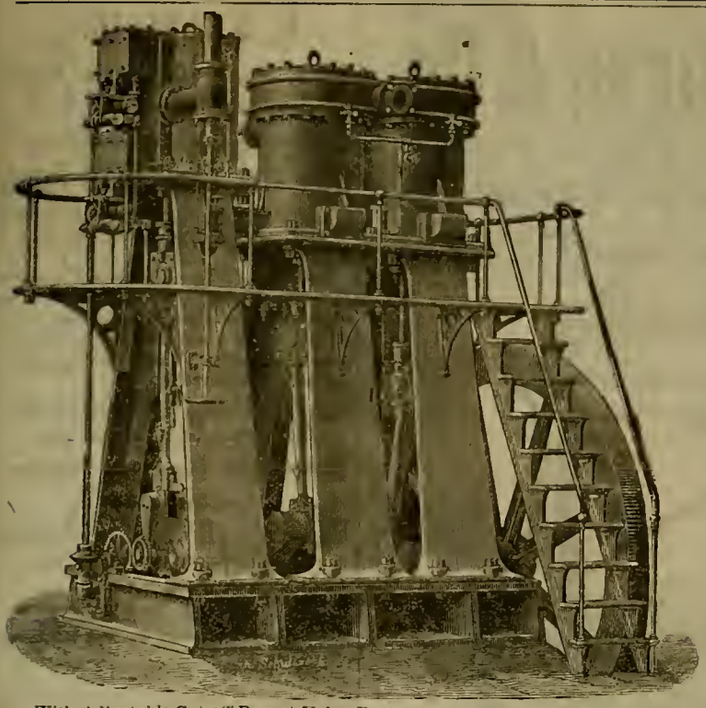

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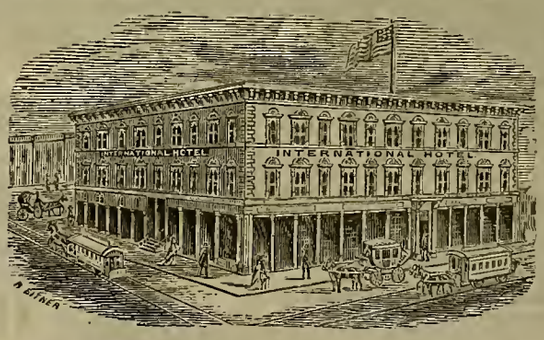

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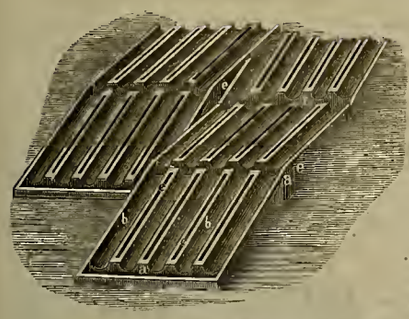

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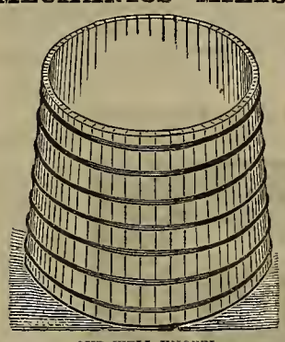

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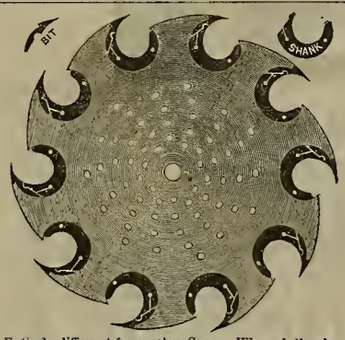

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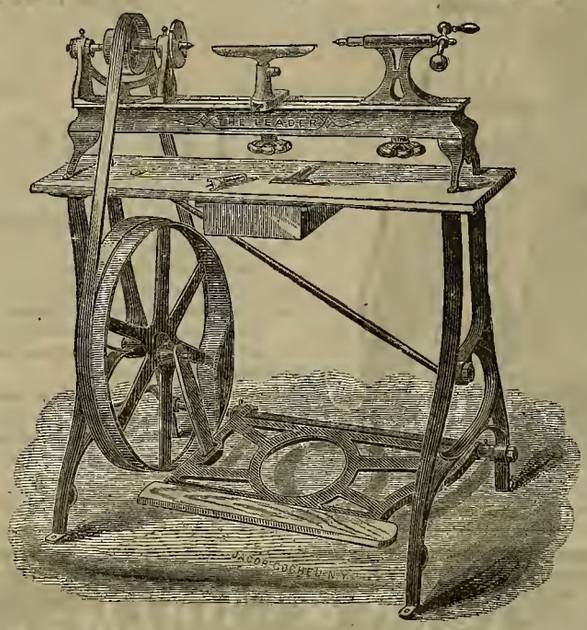

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BY DEWEY & CO., Publishers. | SAN FRANCISCO, SATURDAY, DECEMBER 6, 1879. | VOLUME XXXIX Number 23.

The Nicaragua Canal.

The following resolution in regard to the above project, was introduced in the United States Senate by Senator Gordon on December 2d, viz.:

WHEREAS, The project of the construction of an Inter-Oceanic canal in Nicaragua is recognized as a necessity for the prosperity of the commerce of the world and the development of the maritime and commercial interests of the United States; and

WHEREAS, Such enterprise must of necessity be considered of International utility under the protection of the United States; therefore be it

Resolved, That the Government of the United States pledges to accord full and entire protection to the company which shall be granted a concession by the Government of Nicaragua for the construction of said Inter-Oceanic canal, and will secure to said company the peaceful enjoyment of the rights conceded by such concession

The resolution was referred to the Committee on Commerce. Senator Burnside took advantage of the above, to call up his resolution of last session, reaffirming the Monroe doctrine in connection with the proposed Darien canal, and made a speech thereon.

A short time ago De Franco and Commodore Ammen had a long interview concerning this canal. They estimate the probable revenue for the first year at $10,000,000. Toll would be fixed at $2 per ton. The stock of the Suez canal, though only paying 3%, is in demand on account of the permanency of the investment. The cost of the Suez canal was nearly $100,000,000—the same amount that it is calculated the Nicaragua canal will cost, though the general estimates do not put it above $85,000,000. With all the inconveniences of locks, 100 vessels could easily be passed through every day, but the estimates show that if only one vessel passed through the canal every hour, or if vessels of ordinary tonnage only passed through at the rate of eight per day, the financial success of the canal would be far greater than that of the Suez route, and European capitalists would be glad to invest in it.

It is claimed that there will not be any difficulty in passing this resolution, which is considered the first step in the right direction, and will probably be followed by an authoritative announcement from a leading house in Europe, of its willingness to assume the subscriptions necessary for the construction of the canal. The route to be followed by this canal has been described in the report of the Commission appointed by the President in 1872, and summed up by Gen. Humphreys as follows:

Beginning on the Atlantic side at or near Greytown, running by canal to the San Juan river, thence following its left bank to the mouth of the San Carlos river, at which point navigation of the San Juan river begins, and by the aid of three short canals of an aggregate length of 3.5 miles, reaches Lake Nicaragua; thence across the lake and through the valleys of the Rio del Medio and the Rio Grande, to what is known as the port of Brito, on the Pacific coast. The length of the canal will be 180 miles, with 17 locks, requiring four and one-half days for passage.

De Lesseps, however, seems determined to carry out the programme of the Universal Inter-Oceanic Canal Company, and cut the canal at Panama, which is a level-water and deep-cut canal 45 miles long and requiring two days for passage. The cost of the two routes would be very nearly equal.

De Lesseps, in advocating the Panama route, delivered an address on the 27th of October, at the Hall on the Boulevard des Capucines, Paris, in which he declared that the climate of Panama was one of the most wholesome; that there was no fever there, and that earthquakes were unknown, which latter, operated by five volcanoes on the Nicaragua route, would interfere with the safety of vessels; and called upon the world to witness the fact that he was going to take his wife and three children with him to Panama—a positive proof that Panama was a healthy locality. But M. De Lesseps is a Frenchman, having the interests of France very much at heart. It is extremely probable that if an international canal is cut at all, it will be controlled by Americans.

Leadville Land Case.

An important case, involving in its results the title to all the land upon which Leadville stands, was lately decided by Judge Hallet, United States District Judge. The title to the land upon which the town stands and the suburbs has been derived through patents from the United States Government for placer mining grounds. The case was the St. Louis Smelting and Refining Co. vs. Thomas Kemp *et al.*, and was brought by the company to recover leases which were purchased from the patentee, Thomas Stow, by the company, and which were taken possession of by the defendants. The court decided the patent void, on the ground that it appeared from the evidence that the patentee's tract of placer mining ground was composed of several different placer claims which he had purchased; and it did not appear in the proceedings that he had made as many different applications, had as many runnings made by the Surveyor-General, posted as many different notices, or done $500 worth of work in all the different claims which had been conveyed to him, constituting the tract included in the patent. The case goes to the United States Supreme Court.

There is an old law maxim, frequently forgotten, which reads, "He who sticks to the letter sticks to the bark," from which the meaning is drawn that the spirit of law is of more moment than the mere wording or technicalities. It is upon these technicalities that claim is made to whole cities and towns, not always in the hope of succeeding, but often in the hope that property owners will pay a certain amount to get rid of a law suit. We do not know whether this Leadville case is of a similar nature, but the fact is patent that when a growing city like Leadville is sought to be swallowed up by any individual or corporation, after vested rights have accrued, there is something else besides mere justice sought.

THE STOCKTON INDEPENDENT.—We note with interest the purchase of the Stockton *Independent* by Messrs. Worley and Milne, formerly of the San Francisco *Bulletin*, the former as an editorial writer, the latter as foreman of the printing department. Mr. Worley is a journalist of excellent repute, well informed concerning the industrial interests of the State, a writer of marked ability, and a man of zeal and action. The *Independent* is one of our best interior papers, and occupies an important field. Under the new proprietorship it will be fitted to go farther forward, impelled by a fresh infusion of newspaper ability, nerve and industry. A good newspaper is a great advantage to any community, and this fact will doubtless be shown in the future of the Stockton *Independent*. Its work will be of much importance at this time in the development of the great San Joaquin valley, and the people of that part of the State can hardly give too strong a support to the paper under its new management, because we believe their work will fully justify our expectations of it.

Assaying Cement Copper for Gold and Silver.

We are informed by C. H. Aaron, that the cement copper obtained as a by-product in the treatment of concentrated sulphurets by chlorination, contains more or less gold and silver. It also contains basic salts of iron and copper, which, if salt has been used in the roasting, are in part, at least, chlorides. The assay of this stuff in the wet way, for the gold and silver, is tedious and unsatisfactory. He has therefore adopted the following method:

A weighed quantity of the dried cement is intimately mixed with sufficient litharge to produce a lead button of suitable size, and flowers of sulphur enough to convert all the copper, iron and lithage into sulphides. The mixture, with or without the addition of carbonate of soda and borax, is put into a clay or sand crucible together with several large nails, or the nails may be added after fusion, which is perhaps better. When well fused, with a gentle heat, the heat is raised to bright red or yellow, and continued till the nails, on being seized with the tongs and washed in the slag, or rather matte, are found to be free from adhering lead. The assay is then poured in the usual manner, and the lead button cupelled. The results are very good, especially for gold. This method is suitable for other alloys of gold and silver, if the base metal is such as to be reduced with difficulty or not at all from the sulphide by iron.

Arsenic and antimony, though reducible, will be again taken up by the iron. Zinc is not easily reduced, and is volatile. Tin would probably prove troublesome.

The method also answers with copper ores containing gold or silver, and is convenient where the ore is of such a character that a good deal of copper comes down with the lead in an oxidized assay.

Massive metal should be reduced to powder by filing or otherwise.

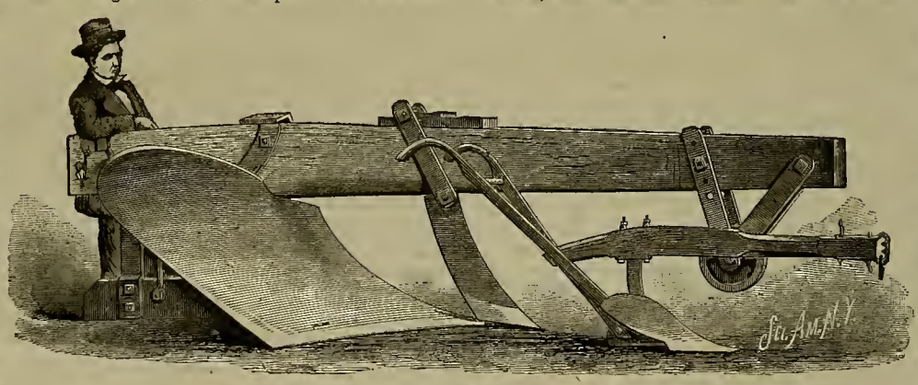
A NEW RAILROAD SIGNAL.—On Wednesday last the Southern Pacific Railroad Company placed in position, at the intersection of the railroad and Valencia street in this city, a pneumatic bell or annunciator for the signaling of approaching trains. The invention, patented by the Pneumatic Manufacturing Company, is for the signaling of trains at any distance from 500 to 1,500 feet, and every car wheel passing over a lever affixed to the rail rings a bell in the station house. The fall of the lever compresses the air in a cylinder to which it is attached, and the compressed air escapes through a tube in communication with the bell at the depot. The invention will undoubtedly prove of the utmost value.

ANOTHER attempt has been made to assassinate the Czar of Russia while on his way from Berlin to Moscow.

A MINOR state of siege still exists in Berlin.

Large Plows.

As an illustration of the immense in land-worrying machinery, we give on this page an engraving of a mammoth plow recently built by the well-known plow makers, Deere & Co., Moline, Ill., for a Missouri railway company. It is calculated to cut a ditch 30 inches wide and 2 feet deep, and is attached to a platform car of a construction train by means of timbers framed and extending out, so that the plow cuts its ditch a sufficient distance from the track. It requires the full power of the locomotive to draw it through the soil, which is a black muck surface and hard clay subsoil. Three furrows, of 8 inches in depth, are required to complete the ditch. One mile of ditch, 2 feet deep and 3 feet wide, is made every four hours. The plow weighs 1,700 pounds, and thus does the work of 1,000 men. The beam is made of swamp oak, the toughest kind of timber, and is 14 by 8 inches in its dimensions, and of proportionate length. No handles are used, the plow being regulated in the manner already named. The landside is a piece of bar iron 8 inches wide and 1½ inches thick. It is larger than merchant iron is made, and was especially forged for this job. The share is of the best cast steel, ½ inch thick by 9 inches in width. This is also of extra large size, and was rolled to order in Pittsburg. The top of the mold board stands 36 inches from the ground, or the base of the plow. It is made of the best cast steel, with iron lining securely bolted to the back. The plow is rigged out with an immense gauge wheel and standing cutter. It is said that its performance is entirely satisfactory to the railroad company.



PLOW FOR RAILROAD DITCHING MADE BY DEERE & CO., ILLINOIS.

The relative size of this plow can be judged by the common sized one, which stands near it in the engraving, and by the hight of the stocky individual who seems to be in doubt whether the beam is quite true.

The facts about this great prairie plow are of course interesting, but we are sorry to see it claimed that this railroad plow is the "largest plow ever built." Nearly two years ago there was another large railroad plow constructed and it too was claimed to be the largest ever built, etc. The fact is that both these giants are less in size than a California plow, which we have described before, but which we allude to again in this connection. A few years ago a plow was built on the Livermore ranch in Kern county, according to the design and under the supervision of Mr. W. H. Souther, which, if it should meet this Iowa plow, it would serve it as a locomotive might a hand-car. It is called the "Great Western," and these are its weights and measurements: Beam, 18 feet long, 18 inches deep and 10 inches thick; landslide, 17 feet long, 5 inches wide and 1½ inches thick; standard, 3 feet high; mold board, 12 feet long and 3 feet high. This plow weighs one ton and is swung by a heavily ironed wooden arch, between two wheels eight feet in diameter and with tires six inches wide. The attaching of the body of the plow to this arched axle of the wheels is accomplished by running two heavy fenders back from the arch, and fastening them to the back ends of the beam and mold board. A 14-foot lever runs from the mold board across the back end of the beam, and on this a man stands to adjust the plow as to depth of cut, etc. The "Great Western" cuts a furrow four feet wide and three feet deep, and is drawn by 80 oxen, yoked to a wire cable one inch thick. This cable weighs 1,140 pounds.

There follows the plow an A shaped scraper, drawn by a chain from its apex by 80 mules. It is 12 feet wide and 3 feet high at the open end. The sides are heavy iron. This, following the plow, shoves the furrow out 10 feet from the place it is left by the plow.

AN effort is making to create a great exporting and importing point for the South and West at Port Royal, S. C.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

The Divining Rod.

EDITORS PRESS:—Your article in the PRESS of the 17th inst. reminds me that I once investigated this subject to some extent. I think you handle the matter much too tenderly. It is my opinion that it is not at all a delusion on the part of the operators, but simply a fraud.

Hearing of Mr. Peck from an acquaintance who believes in the miraculous rod, I called on the gentleman, who was obliging enough to show me the instrument and to give me an exhibition of its use (?). As, however, Mr. Peck said that it would only work in his own or his brother's hands (why so?), it was useless for me to experiment with it myself. The discussion of the subject, however, soon elicited the information that there was another gentleman with another divining rod, which, being less fastidious than that of Mr. Peck, would work in the hands of even so unworthy a person as myself.

Accepting an invitation to join a party of four or five, I went to see this gentleman, whose name, under the circumstances, it might be uncourteous to reveal, wherefore I will simply designate him as Mr. H. On reaching the residence of Mr. H., we were ushered into a small but well-furnished sitting-room, in one corner of which was a piece of furniture with several lumps of silver ore upon and under it. After some conversation, the rod was produced. It was similar to that described by you, which, as already stated, I had also seen. The bulb, however, differed slightly in its construction, and we were informed by Mr. H. that it was the subject of a patent (!). A $20 roll of silver coin being laid on the floor, Mr. H. proceeded to walk over it, holding the rod in his hands, with the bulb directed toward the ceiling. As soon as Mr. H. stood directly over the coin the rod turned in his hands, pointing downwards, Mr. H. *apparently* resisting the movement with all his strength. I then made the experiment myself, but without any result, the same thing happening to some others, while with one or two it was successful. I then requested Mr. H. to repeat the operation, which he did, while I watched him narrowly. Again taking the rod in my hands, I walked over the roll, and lo! the rod turned downward in spite of my *manifest* effort to retain it in its original position.

This was so far satisfactory to all, myself included, but it was thought advisable to test the wonderful properties of the magic wand by making it the means of discovering treasure which was not exposed to the view of the operator. Accordingly, Mr. H. retired from the room, crossing a passage to another room, and the company proceeded to consign purses, watches, and other valuables, to the recesses of a felt hat, which was then concealed, after which Mr. H. was recalled and requested to "locate" the treasure. After going several times around the room, Mr. H. announced that the valuables were in a place where they were not, but he attributed his failure to the fact that a safe containing money was located in a room below, and exactly under the place which he had indicated, so that after all it was not exactly a failure, inasmuch as he had really found a treasure, though not the one of which he was in search.

Of course a "new deal" was accorded in simple justice. On the second return of Mr. H. from temporary banishment, he again made the round of the room several times, during which the rod pointed strongly in various places, until at last, after the manner of the German philosopher who discovered "pantogen," to wit, "by a series of successive approximations," Mr. H. was able to indicate the precise spot where the treasure was concealed. This being unanimously voted a success, we carried the investigation further. A gentleman held the rod a few inches above a large and rich piece of ore, and assured us that he could distinctly feel an attraction. My nerves were perhaps less sensitive, I could feel nothing, and on the former gentleman repeating the experiment with the additional circumstances of my holding a hat before his eyes, while another held the piece of ore sometimes above, below, or on either side of the bulb, the gentleman's guesses as to the position of the ore were invariably and unaccountably erroneous. Other trials gave similar results.

I will not attempt to explain the success of Mr. H. in finding the hidden treasure in his second trial, but will simply mention some little circumstances which I observed, and leave each to form his own conclusions.

Shortly after our arrival, before the performance began, a couple of gentleman dropped in "quite promiscuous." These gentleman were strangers to our party, but were acquainted with Mr. H. They remained in the room while we hid the gold. Being middle-aged gentlemen they had probably forgotten all about the childish game of hide and seek, or "now you burn, and now you freeze."

While Mr. H. was in retirement, no one had the rudeness to offer to stay with him to see whether he remained in the room at the other side of the passage or not.

The manner of holding the rod is peculiar. It is, as you remark, bifurcate, consisting of two slips of whalebone, connected to a sort of bulb or receptacle containing something or nothing, as the case may be. The two handles are not grasped straightforward and honestly as one would take hold of a pair of tongs to lift some light object, but in reverse fashion, with the ends projecting between the thumb and the first finger. Then by turning the hands so that the thumbs are outward, and consequently the finger nails upward, and drawing the hands apart, the slips of whalebone are subjected to considerable flexure, and by a slight movement of the wrists, the bulb is thrown upward.

In this position the ends of the whalebone project slightly from the hands, and spectators are requested to seize one of these ends with the thumb and finger, and try to prevent the downward movement of the rod when pointing to treasure, which it is, however, very difficult to do, because the flexure of the slips in the hands of the operator, give him a great leverage against the thumb and finger of the spectator, who can use no other force than a comparatively feeble torsion of the small projecting end of the slip.

Holding the rod as described, it will be found that a slight movement of the wrists will cause it to turn up or down with considerable force. This movement of the wrists is hardly perceptible, and is effectually disguised by the squirming and straining of the operator in his apparent effort to resist the turning of the rod.

As I have intimated, I found no difficulty in making the rod point up, down or sideways as I wished, though *apparently* of its own accord and even against my efforts.

As a finale, one gentleman was invited to walk across the street with the rod in his hands, and to notice any attraction which he might feel. He felt nothing, but Mr. H. assured us that a vein of copper existed under our feet, and in his hands the rod did not fail to indicate the fact. C. H. A.

Spruce Mountain District, Elko County, Nevada.

EDITORS PRESS:—The question is often asked, particularly by capitalists, where can we go to make a safe and remunerative investment in mining property, to which I will endeavor to answer in such way that it may be of interest and benefit to some of the inquiring minds and readers of your most valuable paper. To all such I would say: First, look for a district where there is no excitement, but where everything is quiet, or, as generally called, *dead*. Next, see if there are any mines in that district sufficiently developed to prove beyond doubt their permanency; also that the quantity and quality of ore is sufficiently good to justify and guarantee a profit in working them. Next, see what the facilities are, such as timber, water, furnace site, etc., for working said mines; also, the distance it is to railroad, which is an important item. Then, if all things are found to be favorable and satisfactory, see if you can buy the property at about one-half less than you would have to pay for it if it was located in a lively camp where everything moves with the tide of excitement. If you can, then in that case I would advise you to do so at once, and then get up a little excitement of your own. That is where the musical part of the programme comes in, and no one can say that it is not honorable or legitimate.

Now then I will say to all capitalists, who wish to invest in good mining property to good advantage, come to Wells, Nevada, and I am confident that you can find mining property that will suit you. I will give you a short description of a group of mines that I visited and examined this fall. They are situated on the eastern slope of the mountain and dip to the east. The chief of this group is called the "Black Forest." It was located in June, 1872, since which time the discoverer (also present owner) has opened and developed it by three tunnels run into the mountain side at different levels, all cutting the ledge and showing large bodies of good ore. The tunnels are connected by inclines run down on the dip of the vein, which gives perfect ventilation through the mine. The inclines also shows large bodies of splendid ore from within 20 feet of the surface to the lower level, which is over 300 feet deep on the dip, the vein dipping at an angle of from 45° to 50° to the east. The hanging wall is white lime and the footwall diorite, under which lies porphyry. The course of the vein is north and south from the lower tunnel. There are two inclines run down on the ledge, making a total depth of about 340 feet. At the bottom of this incline there is to be seen a large body of beautiful gray and yellow carbonate. It was a strike made last spring. The mine is sufficiently developed to show permanency beyond all doubt; and the quantity and quality of ore could not help but please the most fastidious eye. I should judge that there are from 8,000 to 10,000 tons of ore developed and left standing in the mine, and, at least, 600 tons out on the dumps. Judging from some 20 assays shown me, from all the different kinds of ore in the mine, I think it will average from 40% to 45% lead, and from 40 to 50 ounces in silver per ton of ore. The ore is pronounced to be free smelting ore, and if it averages 40% lead, two and a half tons of it will yield a ton of bullion, as there should be no loss in smelting such ore, and at that rate, at the present price of lead, the lead value would more than pay all expenses of mining, hauling, smelting and freighting the bullion to New York market, as the ore can be extracted and placed on the dump at a cost not exceeding $1.50 per ton, and hauled to the furnace for 50 cents per ton, and smelted at a cost not exceeding $7.50 per ton (after furnace and coal kilns are built and ready to run), and the freights on bullion from furnace to New York will cost about $60 per ton. The facilities for working the mines and ore in this camp are all that could be desired—plenty of timber, wood and water. This camp is situated 35 miles south of Wells station, on the Central Pacific railroad. There is a good wagon road from the mines to the railroad. To all who are inexperienced in mining I would say get a practical and reliable expert to come with you to examine the mines in this district for your own satisfaction, and do not depend upon hearsay, as I am aware such is very uncertain; but come and deal direct with the original prospectors, discoverers and present owners of valuable property—by so doing you will find a golden harvest ready to reap.

I will add from good authority that the snow never falls deep enough during the winter to interfere with business. This district and mountain is beautifully located; it being surrounded by fertile valleys and foothills covered with the finest quality of bunch grass, on which thousands of cattle keep fat all winter. The name of this district is "Spruce Mountain," and it is situated in the southeast part of Elko county, Nevada. OLD '49ER.

Wells, November 22d 1879.

"Pliocene Man" in California.

EDITORS PRESS:—I notice in your issue of November 8th an article under the head of "Pliocene Man." Reading said article brings to mind the days of '49. I will copy a portion of the article, beginning near the bottom of the first column, as follows: "The discoveries in California, India and elsewhere seem clearly to indicate that the human race must have existed, over a large portion of the world at least, for an immense period of time, in the primitive condition, that is, at the lowest possible stage of humanity—civilization it cannot be called. So far as California is concerned, the evidence all points in this direction. The implements, tools and works of art obtained are thoroughly in harmony with each other, all being the simplest and least artistic of which it is possible to conceive, whether found in the strata under the basaltic lava, or above, at any point in the detritus, we always recognize the same type."

Here let me give you some evidence which may interest many of your readers. I think it will agree with some of Prof. Whitney's conclusions, and differ from some of those drawn in that part of the article above copied. The proposed evidence is as follows: It was in the month of October, 1850, I, with several others, was mining in California, on the Middle Fork of Feather river, four miles below the mouth of Nelson creek, on what was known as Rich bar, and sometimes called "Volcano" bar. On the top of the mountain about one mile north of said bar was evidently an old extinct crater. We had worked the pay dirt and gravel off of said bar, under which there was a stratum of cement or lava. One day, out of curiosity, four of us sunk a hole about four feet square down through the lava, which was about five feet thick. Under this was a stratum of gravel about one foot thick. This we panned, but could not find any gold. Under the gravel we came upon granite bedrock, and on the granite found an old pick. It was in size and form as near like the picks we were using at that time as it well could be; the eye was the same shape (largest at the outside); it was also worn very blunt. We looked it over and laid it on a pile of rock, one of the boys remarking that we had found old King Solomon's mining camp in the land of Ophir. This evidence shows that California must have been inhabited by civilized man, who had some knowledge of the arts and sciences, previous to the cessation of volcanic activity in the Sierra Nevada, as it was evident that that pick had been used and left there before the lava spread over the surface of the bar and side of the mountain. It is also evident that whoever made and used it had a knowledge of the precious metals, showing conclusively that as far as California is concerned, the conclusions drawn in that part of the article which is copied above are not quite right, as I think Pliocene man is entitled to more credit than that conclusion gives him.

F. F. BEARDSLEY.

THE British Consul at Panama reports that india-rubber has almost ceased to be an article of export from the isthmus, mainly in consequence of the great difficulty and expense of getting at the trees in the remote districts of the interior. Those nearer the coast have been destroyed by the wasteful system pursued by the natives in cutting down the trees to procure the sap.

The Black Hills, Dakota.

An interesting letter from Central City Dakota, was lately published in the Grass Valley *Union*. The letter is from James Gluyas to W. H. Mitchell, of Grass Valley. The writer has been at the Black Hills about two months, and describes that region as the biggest quartz mining country he ever saw. He says:

"The ledges, or what we call the big champion lodes, are running through the hills in every direction and are from 40 to 130 feet from foot to hanging wall, and 10 men can keep a 60-stamp mill running from mouth to month. There are three mines here working with open cuts through the hills, and the Homestake company is running 200 stamps, and putting in 120 more, when they expect to crush 800 tons per 24 hours. The Homestake crushed for the month ending September, 18,000 tons of ore, and cleaned up $75,000. So you see it is not much more than $4 per ton. The Homestake uses a locomotive to run its ore from the open cut to the mill. In our claim we have two lodes; one is 40 feet from wall to wall. In the eastern ledge we are in 125 feet, and no signs of hanging wall yet. We are only running 20 stamps at present, but are putting up a new 60-stamp mill. The machinery is on the ground, and we expect to start up by the 1st of January.

"There are about 1,500 head of stamps running here, within a distance of three miles. The lodes are slate and quartz, and quartz and slate, from wall to wall, and when you look at them as a whole they appear like big cinnabar lodes. The gold is very free in the rock, and nothing is used for saving but copper plates at the batteries—no pans. The ore is very red, and when the men come off shift they look as red as 'rats'—all same old country. We work our mine through two tunnels, and have about 200 feet of backs. Miners' wages, $3.50 per day; carpenters and blacksmiths, $5, and there are hundreds out of work. Flour is $8 and $10 per 100 pounds.

"So much for the mines. The Black Hills are from 500 to 1,000 feet in hight, about 50 miles wide, and 100 miles long. Between the hills are very fine ranches, where they can grow any amount of vegetables. There are three little towns here, Deadwood City, which is three and one-half miles distant from the mine, Central City and Lead City, each about one mile distant. In all they contain about 12,000 inhabitants, chiefly Eastern people.

"There is no gold coin in circulation here, the currency being all greenbacks. The climate is peculiar. There seems to be no summer. The wind blows as it does at Virginia City, but the climate is not as good. Some days we have a burning sun, with a cold and chilling wind, and at the same time freezing. The weather will sometimes change four and five times a day—with rain, snow, freezing, hot and sultry, all in one day. Of course this makes sickness, and every boarding-house contains several sick men.

"Central City is about 1,500 miles northeast of Colfax, and the cost in coming from there, in fare and living, is $130 ($75 from Colfax to Sidney by rail, and $40 from Sidney to Deadwood City by stage, a distance of 300 miles), being six days on the way, three days and two nights of which are in stage."

An Island Belching Hot Water.

A late issue of the London *Telegraph* contains an account from the Lower Danube of the alarming intelligence respecting the strangely abnormal condition of earth's crust in those wild but lovely regions where the rugged Carpathians constitute the Roumano-Hungarian frontier. These mountainous districts were terribly convulsed by the earthquake reported some days ago from Eastern Europe; and the Island of Babagai, which lies in mid-Danube, off Moldova, not far from the Iron Gates, and in close proximity to the tumultuous rapids that agitate the breast of the great river from Orsova to Drenkova, has been the scene of some extraordinary phenomena, which have stricken its inhabitants with panic. During the earthquake a huge gulf was rent in the surface of the island, and promptly emitted an enormous column of scalding water, by which a considerable portion of Babagai was within a few hours inundated. On Sunday, the 18th of October, this destructive geyser ceased to spout as suddenly as it had commenced, but when the vast gap whence it had flowed was dried up it was observed that several ragged-edged craters had formed themselves at the bottom of the drift. These craters have ever since, at brief intervals, vomited hot earth and black sand in large quantities, and apprehensions are entertained that either the island will altogether disappear, or that it will become the site of a permanent volcano. A little further up the river, the picturesque ruins of Goluhacz Castle, an ancient feudal fortalice, built upon the remains of a Roman stronghold, have been completely demolished by the earthquake, which has also filled up the gloomy caves in the rocks beneath Golubacz. These caves were credited, or rather discredited, as the chief breeding places of the malignant mosquitoes that infest the Danube and its banks between Basiasch and Turno-Severin. Their destruction, therefore, is a legitimate source of exultation to the riparian populations. Not so the development of volcanoes and boiling springs in the neighborhood of countless Wallachian and Servian homesteads.

MECHANICAL PROGRESS.

Signaling in Mines.

T. A. Edison and Jesse H. Burnell, a New York electrician, are engaged in working out the problem of signaling between the lower levels of a mine and the engineer on the surface; also, sending signals to the engineer from a cage while ascending a shaft. Mr. Edison is of the opinion that they will be able to do all that is required.

In the meantime I. E. James, Superintendent of the Yellow Jacket, proposes a plan which is very near the mark as regards simplicity and effectiveness. His idea is to run a gas pipe from top to bottom of the shaft, the upper end terminating in a microphone placed alongside of the engineer. On the side of the cage there is to be carried in a suitable scabbard a piece of iron rod of a convenient length to be used in striking upon the gas pipe. Even now, without any microphone or other sounding arrangement, the miners are in the habit of signaling long distances by striking with a hammer upon the iron pipes through which compressed air is conveyed

As regards the sending of electrical signals from cages, or even of talking from them while in motion, we are of the opinion that there are no great difficulties in the way. An iron or steel arm might be extended from the cage to slide up and down the edge of the wire, in the shape of a flat strip of metal, in such a way as to keep those on the cage in constant communication with the engineer and his apparatus above, through an unbroken electrical current.

At all events, whether or not this plan would answer the purpose, we do not doubt that we have on the Comstock mining engineers and machinists who are sufficiently ingenious to satisfactorily work out this signal problem. The ordinary signal rope does very well to a certain depth, but at length a point is reached where the weight of the rope becomes so great that it is hard work for one man to make the signals, and what seems a heavy surge on the rope may, after all, lack force to strike the bell. It is owing to this that the signals sometimes fall short in the number of bells struck.

As the man who pulls a rope in one of our deep mines cannot hear the bell strike, he has no guide in the business of signaling except the amount of force he has used, and it must often be a nice point to decide between what outlay of strength would strike the bell and what would fall short.

Instrument for Measuring the Inclination of Bore Holes.

A useful instrument, says the *Colliery Guardian*, has lately been invented in England, by G. Nolten, of Dortmund, for ascertaining the inclination of bore holes from the perpendicular and for indicating the direction of the inclination. It is well known that bore holes, especially those made with turning tools, are seldom perfectly perpendicular; yet, although it is of the greatest importance to ascertain the amount of this deviation where it is desired to know the exact vertical depth bored, no instrument had been devised for giving such indications until the invention here referred to. In stating the depths of bore holes it is generally assumed that they are perpendicular. In some cases, however, the inclination is sufficient to cause considerable error in calculating the distance of seams from the surface and the thickness and dip of strata.

The action of Mr. Nolten's instrument depends upon the fact that liquids always seek their natural level. The inventor employs a ground, flat-bottomed, colorless glass vessel, the sides of which are exactly at right angles to the bottom. This vessel he half fills with a mixture of one part of hydrofluoric acid to four parts of water. The acid, having the property of etching upon glass, leaves a permanent indication upon the sides of the vessel of the level of the liquid. If the instrument be placed in an inclined position, and if it be kept still for half an hour, the level will be marked in the shape of a ring upon the glass, which is formed in such a manner that exactly at the level of the liquid the inner part of the glass towards the bottom will be etched to the extent of one-tenth of its thickness. Some of the liquid is then taken out, so that its level in a horizontal position will mark itself below the lowest line of the first mark. The glass is then placed upon a perfectly horizontal surface, and being kept in this position for half an hour, the liquid makes another mark. By pouring out the liquid and cleaning the glass, the two marks will be seen clearly, while the glass will remain perfectly transparent. In practice, the glass is placed in a water-tight instrument, having the form of a round-ended cylinder, with a rod passing through the top, by which it is secured to the bore-rods or rope employed for lowering it. With the exception of the gutta-percha flanges, which prevent it from falling heavily when being lowered, this instrument is made entirely of brass, on account of the magnetic needle which is enclosed. The glass vessel containing the etching fluid is closed with a lid and placed in the interior of the cylinder upon a plate which is set exactly at right-angles to the sides of the cylinder. The instrument is then suspended in the bore hole at any depth where an observation is to be taken, and after the manner before described the angle of deviation from perpendicular is arrived at. This result being obtained, there now remains to be found the magnetic bearing of this deviation in a horizontal plane. For this purpose the glass containing the etching fluid is fitted into a ring which is in rigid connection with a compass, and is divided into degrees, etc., similarly to the compass. If this connection, of which the glass with the ring and the compass are parts, is inclined in any direction, whereby the line of inclination is found by means of the liquid in the glass, the direction in a horizontal position of this line is read off by the division on the ring in which the glass is set, at the same time reading the compass, then the difference of these readings will be the magnetic bearing of the line of inclination. In carrying out this method in practice, it is necessary that the reading of the magnetic needle in the bore hole should be the same when the instrument is brought to the surface, so that the bearing may be read. This is accomplished by fastening the needle in the bore hole, allowing it first time to settle by means of a watch forming part of the instrument.

The value of the invention has been proved in practical working in five bore holes at which it has been employed. It has also undergone many experimental trials, with the result of fully confirming the accuracy and reliability of its indications.

MACHINE MINING IN NORTH WALES.—A few days ago a number of gentlemen assembled, upon the invitation of Mr. Edward Williams, J. P. of Wrexham, to visit the immense underground working at the Park Lead mines, and especially the level now being driven with Schram's rock-drills to intersect the lodes. The Schram drills are working very satisfactorily, and the professional gentlemen present, who carefully examined them, pronounced both the machines and the work they were doing as excellent. Both Capt. S. Michell and Mr. Williams displayed the utmost readiness to give information. With one of the 2⅞-in. Schram drills, worked by an 8½-in. compressor, 14-in. stroke, with 30 lbs. of air pressure, the results were—Distance driven, 18 ft., at an average of 3 ft. per day, at a cost of £7 per fm., the miners paying all cost—as dynamite, fuse, candles, etc., and at this price the men put the debris into the tubs and hook on at the bottom of the shaft. By hand labor the driving of the ground would have cost £10 per fathom, and six men would not have driven more than 3 fathoms in a month. It is thus seen that six times the quantity of work is done for 30 % less wages, which is the more satisfactory as the rock is hard and troublesome, and is very fatiguing to work by hand labor. At the conclusion of the inspection an interesting discussion upon mining generally took place, in which Mr. Williams, Captain Ellis and Mr. Reed (Hendre Mines), Mr. Lester (Minera), Captain Michell and others, took part, the general opinion expressed being that both drill and compressor worked admirably. The Schram drill has also been started this week in the Llanrwst district, and it is believed that as soon as the machine becomes better known it will be widely adopted. —*London Mining Journal.*

METAL MOLDING MACHINES.— Within suitable standards Mr. C. H. Taylor, of Leeds, proposes to mount and fix a horizontal plate, and below this in suitable bearings he provides a rammer or plunger of a similar construction to the bottom plunger on a brick machine. A vertical adjustable motion may be imparted to the rammer or plunger by a cam, crank or their equivalents, actuated by some suitable motor. Between the horizontal plate and plunger or rammer he passes a round table, on which are mounted the molding boxes, and within the table is provided a model or pattern to form the desired mold. In the first place the pattern or mold forms the bottom of the box, and in this manner it is passed under a hopper, when simultaneously with the passing under of the box a sliding door is opened at the bottom of the hopper to allow sand to pass therefrom into each molding box, which after being filled is brought between the horizontal plate and the vertical rammer or plunger; when in this position an upward movement is given to the rammer or plunger which lifts the patterns or models up into the sand, at the same time by the assistance of the horizontal plate imparts sufficient pressure to solidify the sand into which the pattern or model is impressed ready to receive the metal. This being done, the box is passed from between the horizontal plate and plunger or rammer, taken off the table and ready for use. Each box in its turn may undergo a similar process as regards the filling and the pressing operations. The table on which the molding boxes are carried may be moved either by the attendant, or from some suitable motive power provided with a stop motion.—*London Mining Journal.*

UTILIZING POWER.—A new invention has been tried with success in London in the utilization of the power generated in stopping street cars for the purpose of re-starting them and thus saving the extra exertion of the horses. The contrivance is a coiled spring, which is wound up by the stopping of the car, and which, when released, acts on the wheels so as to impart motion. It acts, too, as an assistance to horses up a steep grade, the power having been acquired in a preceding down grade and kept stored in the spring until the energy is required.

SCIENTIFIC PROGRESS.

Important Advance in Metallurgy.

In the "World's Work" of the November issue of *Scribner* occurs the following interesting and important item on the recent discoveries made in metallurgy:

"Some recent researches into the behavior of metals under the influence of heat, as in annealing, have led to discoveries that may bring about important changes in the present methods of obtaining commercial shapes of metals, wires, rods, bars, etc. The search for a metal that might be used in electric lamps giving light by incandescence led to experiments on platina wire under repeated heating and cooling by electrical currents. A piece of platina wire was brought to a white heat and kept there for some time, when it was cooled and then examined under a powerful microscope. It may here be observed that this heating was practically annealing, and the result throws a new light upon this old and important process. To the touch the wire was soft and yielding, practically annealed wire. Under the glass the wire was seen to be full of cracks, chiefly of an arborescent form, branched and running into each other in every direction. The heating results in a kind of rupturing or cracking open, and in seeking an explanation of this, it was thought that in bringing the wire suddenly to a white heat, the air held both physically and mechanically in the wire was expanded and exploded, tearing its way out and leaving fissures and cracks all over the surface. These fissures are plainly visible and assume the torn and ragged appearance that might come from such explosions of the contained air. The wire, before stiff, is now soft and yielding, simply because it is cracked and bends readily at every break on its surface. To illustrate this we have only to paint a sheet of paper with a gum like dextrine or even mucilage. When the paper is stiffened draw it over a sharp edge and crack the gum, and the paper will bend freely in every direction. Here the cracks are visible and it is easy to see that they allow the gum to bend. It may, from this, be seen that annealing is a rupturing or cracking of a metal, and that its softness and pliability result from the free play given by the cracks. This discovery at once led to a more important step—the repeated annealing of metals in a high vacuum. A strip of platinum was placed in a small glass tube by melting the glass over the wire at each end of the tube and thus enclosing a portion while the two ends were left exposed. This wire was then connected with a battery, and when a high vacuum had been obtained by means of a Sprengel pump, the wire was brought to a dull heat by means of the battery. It was allowed to remain heated for a few seconds and then cooled. This heating and cooling was repeated many hundred times in the course of ten minutes. Though the process through which the wire passed is not visible, it can be imagined to be somewhat like this: The sudden heating of the air held in the wire caused it to expand and tear its way out, leaving the wire cracked in every direction. The cooling of the metal produced a contraction tending to close up the ruptured fissures, and, as it were, to knead together the particles of the metal. The vacuum assisted the air to escape from the metal by making a difference in the internal and external pressure, and undoubtedly hastened the process. At the end of ten minutes the power of the battery was increased slightly and the heated wire showed a pale red. The alternate heating and cooling at this temperature was kept up for ten minutes and then another advance was made in the temperature. In this way the wire was heated and cooled (practically annealed) for five hours till it was raised to a vivid white heat. As the process went on it was found that the metal passed beyond its melting point and remained intact in temperatures far above those at which in free air it had melted. On the completion of the process the wire was found to be intensely hard and elastic and of a silvery brightness. Under the glass it showed an absolutely unbroken surface, polished like glass and smoother than any wire obtained by the usual processes. It would seem as if this repeated annealing in vacuum had kneaded and compacted the metal, making it more dense than any known metal. It is now as elastic as steel, and, coiled in a spring, retains its elasticity even when at an extreme white heat; furthermore, it can no longer be annealed. The metal appears now to be in a new state of which we had no previous knowledge, and for electric lighting purposes it is practically a new metal with new properties. Experiments with iron and other metals in the same manner produced like results, though of course in a varying degree. All the experiments that have led to these valuable discoveries have been performed upon a limited but practically commercial scale because the pieces of wire treated are only required to be very short. For treating iron rods and bars it is proposed to carry on the annealing in wrought-iron tanks from which the air is exhausted by steam power. For small wires and short rods a current from a Faradic machine (this is the new name proposed for dynamo-electric machines) would be sufficient. For larger masses of metals heating in a furnace would be required, the metal being raised to a temperature a little short of fusion and then allowed to cool in a vacuum. Even one annealing would tend to compact and harden the metal, but repeated heatings would, undoubtedly, give iron new properties, of which we can now have no adequate conception. It may here be observed that annealing in free air tends to soften metals, for the reason that has been given, that is, cracking; whereas this new method of annealing produces in time just the opposite effect. Metals are harder and entirely changed in density and appearance and in their behavior under heat."

HOW RAILROAD TIME IS OBTAINED.—An exchange says: The Pennsylvania railroad and all its divisions and branches are furnished Philadelphia time by Prof. Langley, of the Western Observatory, in Allegheny, Pa. The main clock in Chief Telegraph Operator Suter's office, in the Superintendent's department of the Union depot, is connected with the observatory solar clock by fine electric wire, and every vibration of the pendulum of the solar clock is announced by the tap of a small bell in Mr. Suter's office. The pendulum in the Pennsylvania railroad clock must keep pace with the bell, as in case of failure the pendulum is at once re-adjusted. The solar clock in the observatory is regulated by a sidereal clock, or a clock regulated from fixed stars. The bell is tapped by electricity through a wire connected with a wheel on the second hand of the solar clock, upon which there are 60 cogs, each cog indicating a degree of the sixtieth part of a second. Ten of these cogs are filed out of the wheel, for the purpose of breaking the circuit, and consequently ten taps of the bell are lost every minute. This is done in order to give the operator a start on each minute, and at the end of an hour one minute and ten seconds are not recorded on the bell. At four o'clock each afternoon Operator Suter takes his position at the clock battery and sends the time, as near as science can give it, to Blairsville, Altoona, Columbia, Philadelphia, etc., the Philadelphia and Erie railroad, the Northern Central, and the eastern connections and branches. At five o'clock P. M. the time is given to the different offices by single and double taps of the company's telegraph wires. The same service is given to Columbus, O., and other Western points, and the time is there computed to suit the locality.

EARLY IRON MAKING IN ENGLAND.—In the reign of Edward III, iron was so scarce that the pots, spits and frying-pans of the royal kitchen were classed among the King's jewels. Up to the end of the fifteenth century, English iron was not only dearer, but inferior to that manufactured on the Continent. During the fifteenth century the manufacture of iron began to be extensive in Sussex, where the ore and timber for smelting it abounded, and iron mills soon became numerous in the country. The landed proprietors entered into the business eagerly, and not only were many ancient houses enriched thereby, but several new men acquired wealth and founded families. In the forest of Dean, also, where wood was plentiful, iron was largely smelted. The land, however, soon became denuded of trees in consequence of the exclusive use of charcoal for smelting; people were alarmed, and many edicts were fulminated restricting the manufacture of iron. Eventually the feeling became so strong that from the time of the Restoration the iron manufacture of England rapidly declined. Coal was known, but there was a prejudice against its use on account of its supposed pestilential qualities. Coal, moreover, as then used, injuriously affected the quality of the iron, and it was not till the beginning of the eighteenth century that the first real steps for overcoming the difficulty were taken.

MOLECULAR CONSTITUTION OF LIQUIDS.—R. Pictet has shown that in solid bodies there is a simple relation between their atomic weight, their length of calorific scintillation, and their temperature of fusion. This relation is a consequence of the universality of the laws of attraction, and of the most simple representation of the temperature, regarded as the *amplitude* of the calorific oscillations. On passing from the solid to the liquid state, each solid molecule should contain at least two liquid molecules. Since the molecular cohesion of all bodies is equal at the melting point, on departing from that point the lengths of calorific oscillation should be functions of molecular masses for equivalent aberrations of temperature. If we compare all liquids at their boiling points we should be able to deduce the same numerical formula as for solids. Pictet confirms these views by a comparison of theoretical and observed results in 23 solids and 16 liquids.

TEMPERATURE OF THE SUN.—Newton, Waterston, Ericsson and Senchi have asserted that the sun's temperature cannot be less than from 1,000,000° to 2,000,000° (1,800,000° to 3,600,000° F.); Pouillet, Vioaire, Violle and many others, maintain that the temperature cannot exceed from 1,500° to 2,500° (2,700° to 4,500° F.) F. Rosetti discusses experiments and methods of his own, from which he concludes that the temperature cannot be much less than 10,000° (18,000° F.), or more than 20,000° (36,000° F.)

NUMBER OF OSCILLATIONS IN A MUSICAL NOTE. Pfaundler concluded, from observations with a siren, that two oscillations were sufficient to produce a note. Felix Auerbach, from a combination of physiological, psychological, physical and musical considerations, finds that probably about 20 oscillations are necessary. His views are confirmed by previous observations of Exner, Von Kries and Toepler.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Nov. 13.		Week Ending Nov. 20.		Week Ending Nov. 26.		Week Ending Dec. 4.	
Alpha	14	13	13½	11¾	12	9¾	10	8½
Alta	5¾	5	5	4	4.55	3¼	4	3¼
Andes	1.15	1.10	1.15	1	1.10	1	1	65c
Alps	....	....	....	....	....	....	....	....
Argenta	1	90c	1	90c	95c	80c	95c	85c
Atlantic	....	....	....	....	15c	....	10c	5c
Aurora Tunnel	....	....	....	....	15c	....	....	....
Baltimore Con	....	....	....	....	....	....	....	....
Belcher	4	3.85	3.95	3.05	3.20	2¾	2.95	2
Belmont	1.05	75c	1	90c	1	90c	1	80c
Best & Belcher	21¾	19¾	20	17¾	18¾	16¼	18¼	14
Bullion	6¾	6	6¼	5¼	5¼	4¾	5¼	4.20
Bechtel	1.95	1¼	1.90	1¾	1¾	1¼	1¾	1½
Belle Isle	6	4.10	4.40	3¼	3.30	2	2.65	1.85
Bodie	14¼	11¾	13½	12¼	12¾	10¼	10½	9½
Benton	3.65	3½	3.60	3	3.10	2.60	2.80	2.15
Bulwer	11½	11	11	10½	10¼	9¾	10	9¾
Boyle	....	....	....	....	....	....	....	....
Black Hawk	70c	65c	70c	50c	50c	....	25c	20c
Belvidere	70c	65c	75c	70c	50c	....	60c	45c
Booker	1.30	90c	1.05	95c	85c	75c	85c	75c
Caledonia	2.30	1.60	1.95	1½	1½	1¼	1½	1.05
California	5¾	5¼	5¼	4¾	5	4.65	4¾	3.70
Challenge	2.60	2½	2¾	2¼	2.60	2.20	2.20	1.80
Chollar	8¾	8	7¾	6¾	6	7	8	7
Confidence	11½	10¾	11	9¾	10½	9	9½	7
Con Imperial	1.05	90c	90c	75c	80c	65c	70c	55c
Con Virginia	5¾	5½	5½	5½	6¼	5	5¼	4½
Crown Point	3.90	3½	3.90	3	3.05	2½	2.60	2
Con Washoe	....	....	....	....	....	....	....	....
Champion	20c	15c	40c	15c	30c	25c	30c	25c
Concordia	....	....	....	....	....	....	40c	20c
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	1½	1.05	1¼	1.10	1.20	1.10	1.10	1
Eureka Con	26½	25½	26	19¾	17¾	16¼	19	16½
Exchequer	4.90	4.60	4.60	4	4.30	3¾	4	3.40
Endowment	90c	55c	90c	75c	80c	60c	75c	70c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	2¼	2	2¼	2	1.95	1¾	1	25c
Gila	50c	35c	40c	30c	40c	30c	35c	20c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	13	12¼	13	12¼	....	....	13	12¼
Goodshaw	50c	35c	40c	35c	35c	25c	20c	15c
Gould & Curry	11½	10½	10½	9¼	9¾	8	8½	7½
Hale & Norcross	20¼	17¾	18	13½	14¼	13	14½	11
Hillside	1¾	1½	1¾	1.70	1.40	80c	1.10	1
Highbridge	....	....	....	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	15c	10c	20c	10c	20c	....	....	....
Independence	1½	1¼	1.35	90c	60c	75c	80c	70c
Julia	3½	3.15	3.15	2½	2.35	1.60	1.95	1.20
Justice	2.95	2.60	2¾	2.4	2½	2	2.35	1.60
Jackson	4½	4	4	3½	....	....	....	....
Joe Scates	....	....	....	....	....	....	....	....
K K Con	3¼	3	3¼	....	4	....	4	3½
Kentuck	4.10	4	3.90	....	3¾	3½	3½	3
Kossuth	25c	....	20c	....	20c	15c	15c	....
Keystone	....	....	3.65	3.60	3½	....	....	....
Lady Bryan	55c	50c	50c	25c	40c	35c	50c	25c
Lady Wash	1.10	1	1.05	90c	90c	70c	80c	50c
Leopard	50c	....	45c	25c	25c	20c	25c	....
Leviathan	60c	50c	50c	40c	40c	25c	30c	25c
Leeds	75c	60c	50c	....	50c	40c	50c	40c
Lee	....	....	....	....	....	....	....	....
May Belle	35c	30c	35c	25c	25c	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	2.60	2½	2.60	2½	2¼	2.10	2	....
Martin White	1½	1¼	1¼	1.20	1¼	1.10	1	80c
McClinton	70c	40c	75c	60c	50c	40c	45c	40c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	34½	30¼	33	26	29	23½	24¼	20
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	5	....	....	....
North Con Virginia	....	....	....	....	10¾	10	10¼	....
New York	35c	30c	30c	20c	50c	20c	45c	30c
Northern Belle	6	5½	6½	6	6¾	6½	6¼	6
New Coso	....	....	....	....	....	....	....	....
Navajo	75c	65c	60c	45c	50c	35c	30c	25c
Occidental	2.30	2	2.15	2	1¼	1	2	1¼
Ophir	32	30¼	31½	26½	30	26	26¾	22½
Oriental	20c	5c	25c	10c	15c	5c	....	....
Overman	9¼	8¼	8¾	8	8¼	6¾	7	5¾
Panther	....	....	....	....	....	....	....	....
Phenix	3¾	3½	....	....	....	....	....	....
Phil Sheridan	35c	30c	35c	30c	25c	20c	25c	20c
Potosi	5¾	5¼	5¾	4½	4.90	4¼	4.55	3.60
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	1½	1¼	1.40	1.20	1.10	1	1	....
Richer	20c	....	....	....	....	....	5	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	16¾	15¾	15	12¼	11¾	9¾	10¼	7¾
Seg Belcher	....	....	15	13	15	12	16	15
Sierra Nevada	57	61¾	53	44½	45	37½	39¾	39
Silver Hill	1½	95c	1.60	65c	1½	1¼	1.35	1
Silver King	6¾	6¼	6	5½	....	....	5	4
Silver Prize	....	....	....	....	....	....	....	....
Succor	30c	25c	30c	....	....	....	20c	....
Summit	1.65	1¼	1.70	1¼	1.20	90c	1.10	80c
Scorpion	4¾	4.40	4½	3.80	3.85	2½	3.10	1.95
Solid Silver	30c	25c	30c	....	....	....	35c	....
South Bodie	20c	....	25c	20c	30c	20c	25c	15c
South Standard	....	....	....	....	15c	....	....	....
Star	40c	....	35c	30c	35c	25c	25c	20c
St. Louis	....	....	....	....	....	....	....	....
Syndicate	6	5	5¾	3.90	3.10	2.90	3	2
Tioga Con	3.40	2.70	3	2¾	2¼	2	2¼	2
Tiptop	1.65	1.35	1.95	1½	1.60	1½	1¾	1.65
Trojan	15c	10c	10c	....	10c	....	10c	5c
Union Con	83	62½	66½	52½	60	43¾	61	45¾
Utah	20¾	18½	18¼	16	17¾	14¾	16	14
Vermont Con	....	....	....	....	....	....	....	....
Ward	2.40	2.10	2.10	1¾	1.90	1.35	1½	1.20
Wells-Fargo	10c	5c	10c	5c	5c	....	5c	....
Woodville	25c	....	30c	25c	25c	20c	20c	15c
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	16½	15	16½	14¾	15¾	13	13¾	11¾

Sales at S. F. Stock Exchange.

Friday A. M., Nov. 28.
225 Alta....4@3¾
565 Andes....90c@1
950 Atlantic....10c
80 Alpha....10
220 Belcher....2.95@2.90
150 Bullion....5@5¼
375 Benton....2.80@2¾
225 Best & Belcher....16¾@16¾
75 California....4¾@4.70
20 Crown Point....2.60
420 Con Virginia....5¼@5¾
595 Chollar....7¾@8
670 Con Imperial....70@65c
10 Confidence....9½
1100 C Dorado....1.90
160 Challenge....2.20
60 Caledonia....1¼
145 Exchequer....3.90@4
340 Flowery....30c
300 Gould & Curry....8¼@8¾
750 Golden Gate....2
1130 Hale & Nor....14¼@14½
390 Justice....2.15@2.35
465 Julia....1.90@1.95
60 Kentuck....3¼@3½
240 Lady Bryan....35@40c
50 Leviathan....25c
200 Lady Wash....60c
2900 Mackey....15@10c
605 Mexican....24¼@24¾
25 North Carson....10c
100 New York....45@35c
155 Overman....7@6¾
460 Ophir....26½@26¾
100 Occidental....2@1¾
95 Potosi....4.55@4½
150 Phil Sheridan....20c
630 Savage....10¼@10
200 Solid Silver....35c
470 Silver Hill....1.20@1.35
30 S Potosi....10c
620 Sierra Nevada....39@39½
205 Scorpion....2.95
1215 Union Con....53@52
115 Utah....16@15¾
50 Woodville....20c
1000 Wells Fargo....5c
350 Ward....1½
235 Yellow Jacket....13½@13¾

AFTERNOON SESSION.
220 Argenta....90@95c
450 Albion....20@25c
665 Adenda....60c
250 Belmont....80c
110 Bodie....10¼
140 Bechtel....1½
155 Bulwer....10
50 Belvidere....50c
300 Booker....80c
310 Belle Isle....2.65@2½
350 Champion....30@25c
25 C Pacific....5¾
200 Caledonia (B H)....3.55@3¾
300 Concordia....40c
1500 Day....1@1.10
60 Eureka Con....16½
1200 Endowment....70@75c
835 Grand Prize....65c@1
50 Gila....35c
100 Goodshaw....15c
190 Golden Terra....13
50 Hillside....1
50 Jupiter....1½
50 K K Con....4
140 Leopard....25c
15 Manhattan....2
50 Metallic....90c
215 Mt Diablo....10½
90 Mono....5
25 Martin White....1
10 Mammoth....6
20 Northern Belle....6
400 N Belle Is....35c
435 Noonday....4
30 N Noonday....3¼@3¾
145 Paradise....1¾@1.20
50 Queen Bee....30c
40 Ray'd & Ely....1
400 Star....25@20c
410 Summit....90c@1
670 S Bodie....20@25c
325 Syndicate....2.95@3
315 S Bulwer....65@50c
250 Tioga Con....2¼
200 Tiptop....1¾@1.70
50 Wales....3¾

Saturday A. M., Nov. 29.
470 Alta....3¾@3.60
80 Alpha....9¼@9
450 Andes....65@80c
560 Argenta....95@90c
1400 Albion....25@30c
340 Belcher....2½
365 Best & Belcher....18¼@15¼
170 Bullion....4.60
135 Bodie....10½
395 Bechtel....1½
210 Belle Isle....2.60@2.55
100 Bulwer....10
200 Booker....60c
150 Boston....1½
580 California....4¾@4½
410 Con Virginia....5@5¼
20 Confidence....9
330 Caledonia....1½@1.20
370 Chollar....7¼@7¾
150 Crown Point....2.10
755 Con Imperial....60@65c
25 C Pacific....6
350 Caledonia (B H)....3½
400 Day....1.05
110 Eureka Con....18@18½
1700 Endowment....70@75c
310 Exchequer....3½@3.65
250 Flowery....25@30c
360 Gould & Curry....7¾
100 Gila....30c
650 Grand Prize....25@@30c
200 Golden Terra....12¾@12½
430 H & Norcross....12¾@13
275 Hillside....1
50 Independence....80c
85 Justice....2.05
60 Julia....1.60@1.65
20 Kentuck....3
560 Lady Bryan....30@25c
215 Leviathan....25@30c
2410 Mackey....10c
630 Mexican....20¼@21
50 McClinton....40c
100 Mount View....3
160 Mono....5
200 N Belle Is....30c
200 Northern Belle....6
660 N Bonanza....85@95c
50 Navajo....30c
80 N Noonday....3.10
85 Noonday....4
220 Overman....6¼@6
100 Orient....15c
600 Ophir....21¾@22½
470 Potosi....3.90@4
150 Paradise....1.20
200 Star....25c
1005 Sierra Nevada....35@37½
295 Silver Hill....1¼@1.15
200 Solid Silver....35c
730 Scorpion....1.95@3
260 Savage....9¾@9
330 Syndicate....2¼@2.60
100 Summit....1
600 Santa Mina....1.20
150 S Bulwer....50@55c
50 Silver King....4
190 Tioga....2¾
425 Tiptop....1.65
140 Utah....15
460 Union Con....46@47
100 Ward....1.30
915 Yellow Jacket....13@12¾

Monday A. M., Dec. 1.
165 Alta....3½@3.30
150 Alpha....8½@8¼
80 Andes....85c
650 Atlantic....10c
585 Belcher....2@2.05
650 Best & Belcher....15@14¾
1780 Bullion....4½@4.20
210 Benton....2¼
295 California....4.55@4½
160 Con Imperial....60@55c
180 Crown Point....2.30
580 Con Virginia....5
475 Chollar....7@7¾
180 Challenge....1.80
250 Caledonia....1.05
55 Confidence....8
80 C Dorado....1.60
200 Dardanelles....70c
640 Exchequer....3½
440 Flowery....20c
410 Gould & Curry....7¼@7¾
325 Golden Gate....2
500 Hale & Nor....12¼@11¾
330 Justice....1.90@1.60
320 Julia....1½@1.20
190 Kentuck....3¼
1170 Lady Bryan....50@40c
100 Lady Wash....50c
50 Leviathan....25c
865 Mexican....20@20½
2000 Mackey....10c
200 Mt View....2.40@2½
245 N Bonanza....75c
280 New York....35@30c
375 Ophir....22¼@23
90 Overman....6@5¾
40 Occidental....1.40
280 Potosi....3¾@3.60
385 Savage....7¾@8¼
10 Seg Belcher....16
740 Sierra Nevada....35@35¾
100 Succor....20c
95 Silver Hill....1.15
135 Scorpion....2.60@2.90
100 Solid Silver....35c
120 Utah....14¾@14
560 Union Con....45¾@46½
340 Ward....1¼@1.20
350 Yellow Jacket....12¼@12

AFTERNOON SESSION.
1675 Argenta....90@35c
2200 Albion....40@50c
1145 Adenda....60@65c
125 Belmont....1
270 Booker....80@85c
265 Belle Isle....2@1.85
225 Bulwer....10@9¾
250 Belvidere....60c
75 Bodie....10@9¾
1220 Bechtel....1.65@1¾
150 Boston....1.40
200 Champion....30c
750 Concordia....20c
25 C Pacific....6
800 Day....1@1.10
100 D Standard....30c
1100 Endowment....70@65c
260 Eureka Con....19
650 Grand Prize....60c
200 Goodshaw....20c
100 Giant & O A....5
820 Gila....30c
160 Hillside....1@1.10
550 Independenca....80@75c
50 K K Con....4
175 Leeds....40@50c
60 Mono....4¼
50 McClinton....45c
400 M White....80@90c
75 Mammoth....6@5¾
100 Mt Diablo....10¾
70 N Belle Is....80c
520 Northern Belle....6@6¼
350 Noonday....4
100 Paradise....1.20@1.15
950 Queen Bee....40@50c
100 Real del Monte....4½
50 Raymond & E....1
80 Silver King....5
810 Syndicate....2.40@2¼
820 S Bulwer....60c
300 Summit....90c@1.10
750 Tiptop....1¾
1100 Tuscarora....20@25c
1200 Tioga Con....2¼@2
400 University....10c
1000 Wales....3¾

Tuesday A. M., Dec. 2.
130 Alpha....8¾
700 Alta....3½@3.60
320 Andes....65@70c
300 Belcher....2¼@2.30
235 Bullion....4¾@4.90
195 Best & Belcher....15¼
255 Benton....2½@2.55
735 Crown Point....2.15@2.10
1120 Con Virginia....4.90@4.60
1050 Chollar....7@7¼
800 Con Imperial....60c
850 Con Dorado....1¾
435 Caledonia....1.05@1.10
630 California....4½@4.30
70 Confidence....7@7¼
1020 Challenge....1.80
200 Dardanelles....75c
310 Exchequer....3½@3.55
1050 Flowery....20@25c
235 Golden Gate....2
190 Gould & Curry....7¾@7¾
545 H & Norcross....12@11¾
350 Justice....1¾@1.80
680 Julia....1½@1.60
190 Kentuck....3¼@3½
700 Kossuth....15c
420 Lady Wash....55c
1120 L Bryan....50@40c
150 Leviathan....25c
1355 Mexican....22½@23¼
2350 Mackey....10c
150 Mt View....2.40
100 N Bonanza....70c
750 New York....30@35c
530 Ophir....25@26
185 Overman....6@5¾
100 Occidental....1.35
400 Phil Sheridan....25c
645 Potosi....4@4.05
10 Seg Belcher....15
240 Silver Hill....1.15@1.10
505 Scorpion....3.10@3¼
350 Savage....9@8¾
965 Sierra Nevada....39@37¼
100 Trojan....5c
1425 Union Con....52@53¼
60 Utah....14¾@14½
315 Ward....1.30@1.40
200 Woodville....20@15c
285 Yellow Jacket....12¼@12½

AFTERNOON SESSION.
800 Albion....40@45c
1035 Addenda....60c
785 Argenta....90c
1150 Altss....25c
645 Belmont....90@35c
140 Belle Isle....2
120 Bodie....9¾
200 Belvidere....45c
1100 Bechtel....1.65
400 Black Hawk....20c
425 Booker....80@85c
65 Boston....1½
500 Champion....25@30c
100 Concordia....20c
30 C Pacific....5¾@6
15 Caledonia (BH)....3½
925 Day....1.05@1.10
100 D Standard....30c
30 Eureka Con....18½
1100 Endowment....70@75c
120 Grand Prize....55c
500 Gila....25c
40 Hillside....1
150 Independence....70c
350 Jupiter....1.40@1.30
120 K K Con....3½@4
305 McClinton....40c
430 Mono....4¼
100 Mammoth....5¾@6
400 Martin White....90c@1
115 Northern Belle....6
150 Navajo....30@25c
150 N Belle Is....30c
70 Noonday....4@3.90
75 Paradise....1.10
580 Queen Bee....50c
500 Raymond & Ely....1
80 Richer....5
200 Star....20c
800 S Bulwer....55c
100 S Bodie....20c
50 Silver King....5
295 Syndicate....2.10@2¼
820 Tioga....2
650 Tiptop....1.70
50 University....10c

Wed'sday, A. M., Nov. 3.
90 Alta....3.35@3.45
80 Alpha....9
850 Atlantic....10c
780 Andes....65c
555 Benton....2¼@2.35
165 Belcher....2¼@2.35
20 Best & Belcher....15¼@15¾
535 Bullion....5¾@5¼
10 Chollar....7¼
130 Con Virginia....4.90@4¾
440 C Dorado....1.60@1½
195 California....4.40
320 Challenge....2@2.10
160 Crown Point....2.15@2.10
975 Con Imperial....65c
150 Confidence....7½
200 Dardanellca....75c
395 Exchequer....3.90@4
150 Flowery....25c
175 Golden Cate....2
135 Gould & Curry....7¾@8
135 Hale & Nor....12¼@12¾
60 Justice....1.90@2
400 Julia....1.70@1.65
100 Kossuth....15c
50 Kentuck....3¼@3.30
50 Leviathan....25c
530 Lady Wash....75@70c
840 Mexican....24¼@24
2300 Mackey....10c
150 Mountain View....2.10
100 New York....35c
450 N Bonanza....70@75c
260 Ophir....26½@26
130 Overman....5¾
100 Phil Sheridan....25c
650 Potosi....4
140 Savage....9@8¾
80 Silver Hill....1.10
315 Scorpion....3
415 Sierra Nevada....39@39¾
110 Utah....15¼@15
565 Union Con....61@59¾
50 Yellow Jacket....12¼

AFTERNOON SESSION.
625 Adenda....70@60c
250 Argenta....85c
1100 Atlas....15@20c
600 Albion....25@30c
100 Bulwer....10
130 Belmont....95c
310 Belle Isle....2.10
220 Boston....1½
110 Booker....80@75c
550 Black Hawk....20@25c
465 Belvidero....50@60c
150 Bodie....9¾@9½
225 Bechtel....1.55@1½
650 Champion....25c
300 Concordia....20c
20 Con Pacific....6
100 Caledoma (B H)....3½
120 Day....1.10
350 Dudley....50c
195 Eureka Con....18½@18
30 Endowment....75c
300 Florida....25c
450 Gila....20c
50 Grand Prize....60c
285 Goodshaw....10@5c
245 Jupiter....1 20@1¼
100 K K Con....4
140 Mono....4¼@4
70 Manhattan....2
385 M White....90c
10 Mammoth....6½
650 McClinton....45@40c
40 Mt Diablo....12
150 N Belle Is....30c
190 Noonday....3¾@3.70
165 N Noonday....2.70@2¾
100 Northern Bolle....6¼
650 Navajo....25c
200 Paradise....90c
205 Queen Bee....45@40c
600 Raymond & E....1
200 Star....20c
1100 S Bulwer....50c
100 S Bodie....15c
185 Summit....90@80c
275 Syndicate....2.15@2
25 Silver King....5
65 Tioga Con....2.10
550 Wales....3¼

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Alpha Con M Co	Nevada	11	1 00	Nov 26	Dec 30	Jan 20	Wm Willis	309 Montgomery st
Aurora Tunnel & M Co	California	4	10	Nov 13	Dec 15	Jan 8	C V Hubbard	203 Bush st
Argonaut M & M Co	California	2	10	Oct 7	Nov 15	Dec 8	J L Fields	240 Montgomery st
Caledonia S M Co	Nevada	29	50	Nov 10	Dec 16	Jan 6	R Wegener	414 California st
Champion M Co	California	4	20	Oct 15	Nov 20	Dec 9	Jno Crockett	203 Bush st
Curtis Con M Co	Nevada	2	05	Nov 21	Dec 24	Jan 12	H S Stone	419 California st
Crown Point G & S M Co	Nevada	39	1 00	Nov 17	Dec 22	Jan 12	Jas Newlands	203 Bush st
Defiance G M Co	California	4	30	Nov 12	Dec 17	Jan 6	W H Lent	309 Montgomery st
Dudley M Co	California	6	25	Nov 19	Dec 20	Jan 16	E C Masten	309 Montgomery st
Flowery M Co	Nevada	3	25	Nov 14	Dec 19	Jan 7	W W Stetson	309 Montgomery st
Gen'l Thomas M & M Co	Nevada	5	25	Nov 3	Dec 8	Dec 29	Wm Willis	309 Montgomery st
Grand Prize M Co	Nevada	3	75	Nov 25	Dec30	Jan 20	E M Hall	327 Pine st
Hillside M & M Co	Nevada	1	50	Nov 21	Dec 24	Jan 13	F Frankenthal	330 Pine st
Independence M Co	Nevada	4	25	Nov 15	Dec 18	Jan 8	E M Hall	327 Pine st
Indian Queen M & M Co	Nevada	2	10	Nov 6	Dec 20	Jan 10	A K Durbrow	309 Montgomery st
Julia Con M Co	Nevada	10	1 00	Nov 19	Dec 24	Jan 16	H A Charles	419 California st
Jupiter M Co	California	6	35	Nov 12	Dec 15	Jan 8	E C Masten	309 Montgomery st
Justice M Co	Nevada	30	50	Nov 29	Jan 3	Jan 24	R E Kelly	419 California st
McCrackin Con M Co	Arizona	4	25	Nov 17	Dec 24	Jan 20	A Wenzelburger	216 Sansome st
Mexican G & S M Co	Nevada	9	2 00	Nov 7	Dec 11	Dec 31	O L McCoy	203 Bush st
Murchie G & S M Co	California	2	25	Oct 9	Nov 8	Dec 8	S D Rogers	328 Montgomery st
New York M Co	Nevada	20	30	Oct 22	Nov 24	Dec 16	D L Thomas	203 Bush st
North Bonanza M Co	Nevada	4	25	Nov 21	Dec 26	Jan 15	W W Stetson	309 Montgomery st
Northern Belle Isle M Co	Nevada	1	10	Nov 8	Dec 11	Dec 31	E M Hall	327 Pine st
Occidental Con G M Co	California	3	10	Nov 10	Dec 20	Jan 10	W T Smith	402 Montgomery st
Oriental Con G & S M Co	California	5	25	Nov 8	Dec 10	Dec 27	H C Hinman	411 California st
Overman S M Co	Nevada	44	2 00	Nov 25	Dec 31	Jan 21	Geo D Edwards	414 California st
Potosi M Co	Nevada	2	50	Nov 4	Dec 9	Dec 30	W E Dean	203 Bush st
Real del Monte M Co	Nevada	9	25	Dec 1	Jan 3	Jan 24	C V D Hubbard	203 Bush st
Rough & Ready Con G M Co	California	1	05	Oct 15	Nov 19	Dec 9	W H Lent	309 Montgomery st
Savage M Co	Nevada	40	1 10	Nov 9	Jan 2	Jan 22	E B Holmes	309 Montgomery st
Seg Belcher M Co	Nevada	16	3 00	Oct 31	Dec 5	Dec 26	Geo D Edwards	414 California st
Sierra Nevada S M Co	Nevada	60	2 00	Oct 31	Dec 4	Dec 24	W W Stetson	309 Montgomery st
Silver Hill M Co	Nevada	8	50	Oct 16	Nov 19	Dec 11	W E Dean	203 Bush st
Solid Silver G & S M Co	Nevada	2	25	Oct 6	Nov 10	Dec 8	J J Applegate	320 Sansome st
Tioga Con M Co	California	8	20	Nov 26	Dec 31	Jan 21	W H Lent	309 Montgomery st
Utah S M Co	Nevada	27	2 00	Oct 22	Nov 25	Dec 13	G C Pratt	309 Montgomery st
Wells Fargo M Co	Nevada	13	10	Nov 17	Dec 22	Jan 9	D L Thomas	10 Leidesdorff st
Yellow Jacket S M Co	Nevada	24	1 00	Oct 13	Nov 18	Dec 18	Mercer Otey	Gold Hill, Nevada

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Aurora M Co	California	1	10	Dec 3	Jan 3	Jan 18	P Conklin	28 Sansome st
Alpha Hydraulic Grav M Co	California	1	20	Oct 2	Nov 10	Dec 13	James Ireland	216 Sansome st
Butte Hydraulic M Co	California	—	10 00	Oct 31	Dec 2	Dec 22	L L Dennery	220 Sansome st
Cataract & Wide West H M Co	Cal	—	25	Nov 15	Dec 22	Jan 12	Wm B Lake	26½ Kearny st
Chollar M Co	Nevada	—	50	Nov 4	Dec 9	Dec 29	W E Dean	203 Bush st
Diana G & S M Co	Nevada	4	10	Sept 24	Nov 17	Dec 15	J T McGeoghan	318 Pine st
Florida Hill M Co	Idaho	1	10	Oct 31	Dec 5	Dec 30	R Wegener	414 California st
Hazard Grav M Co	California	4	03	Dec 2	Jan 5	Jan 25	J T McGeoghehan	318 Pine st
Mayflower G M Co	California	6	10	Oct 9	Nov 12	Dec 9	J Morizio	328 Montgomery st
Meadow Valley M Co	Nevada	15	25	Sept 12	Nov 12	Dec 8	T W Colburn	414 California st
Monte Cristo Con M Co	California	1	10	Oct 3	Nov 17	Dec 15	Butler Burris	309 Montgomery st
Morgan M Co	California	5	80	Nov 13	Dec 23	Jan 15	J J Raphael	533 Kearny st
Northern Light G & S M Co	Cal	5	10	Nov 5	Dec 8	Dec 26	F S Monroe	310 Pine st
Numa M Co	Nevada	2	02	Oct 23	Dec 22	Jan 12	D Wilder	328 Montgomery st
Quartz Mountain C M Co	California	8	50	Dec 1	Jan 5	Jan 26	E Hestres	729 Montgomery st
Quinn M Co	California	—	25	Nov 15	Dec 19	Jan 7	T J Blakeney	Palace Hotel
Revenue M Co	Nevada	1	50	Nov 26	Dec 29	Jan 23	A J Bunner	411½ California st
San Xavier M & S Co	Arizona	1	25	Oct 14	Dec 1	Dec 22	F A McGee	32 Merchants' Ex
South Bulwer G M Co	California	5	25	Oct 27	Nov 29	Dec 20	W Stuart	320 Sansome st
Summit G M Co	California	4	30	Nov 17	Dec 22	Jan 12	W H Lent	309 Montgomery st
Telfair M Co	Arizona	1	02	Nov 12	Dec 20	Jan 15	J Pentecost	702 Market st
Tellurium G & S M Co	California	20	10	Dec 8	Jan 7	Jan 29	J M Litchfield	415 Montgomery s
Wide Awake P & M Co	Arizona	8	03	Oct 11	Nov 11	Dec 11	C Hildebrandt	232 Sutter s

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Andes S M Co	Nevada	M Landers	309 Montgomery st	Annual	Dec 10
Amazon Con M Co	Nevada	John Crockett	203 Bush st	Annual	Dec 9
Bechtel Con M Co	California	W H Lent	309 Montgomery st	Annual	Dec 8
El Tesoro S M Co	Arizona	W H Chickering	214 Sansome st	Stockholders	Dec 15
Gould & Curry S M Co	Nevada	A K Durbrow	309 Montgomery st	Annual	Dec 15
Ophir S M Co	Nevada	C L McCoy	203 Bush st	Annual	Dec 17

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Belle Isle M Co	Nevada	R H Brown	S F Stock Ex	75	Nov 5
Bodie Con M Co	California	W H Lent	Nevada Block	50	Dec 1
Eureka Con M Co	Nevsda	W W Traylor	37 Nevsda Block	2 00	Oct 20
Pioneer M Co	California	J W Pew	310 Pine st	08	Oct 6
Standard Con M Co	California	Wm Willis	309 Montgomery st	50	Dec 12

SALES OF LAST WEEK AND THIS COMPARED

Wed'sday A. M., Nov. 26.
80 Alpha....9¼@9½
410 Alta....3¼@3.60
930 Andes....1
550 Atlantic....15c
220 Best & Belcher....16½@16¼
580 Belcher....2.90@2.85
500 Bullion....5@4¾
485 Benton....2.60@2.65
450 California....4.80@4.65
410 Con Virginia....5@5¼
1180 Con Imperial....70@65c
100 Crown Point....2.60@2.55
1025 Chollar....7@7¼
55 Confidence....9@9¼
175 Challenge....2.20@2¼
280 Caledonia....1¼
1250 Con Dorado....2@1.90
150 Dardenelles....70c
225 Exchequer....3.90@3.95
365 Flowery....25c
290 Gould & Curry....8@8½
1540 Golden Cate....2.30@2
375 Hale & Nor....13¼@13
270 Justice....2
400 Julia....1.90@1.80
10 Kentuck....3½
100 Kossuth....15c
250 Lady Bryan....35c
320 Lady Wash....80@75c
645 Mexican....23¾@24
50 Morning Star....5
120 Mackey....15c
510 Mt View....2.30@2¼
570 N Bonanza....70@75c
50 North Con Vir....10¼
510 New York....40c
90 Ophir....26
100 Overman....7@6¾
120 Occidental....1¼
290 Potosi....4.40@4¼
100 Phil Sheridan....20c
515 Savage....9¾@9¾
720 Sierra Nevada....39@38
10 Seg Belcher....14
250 Silver Hill....1¼
580 Scorpion....2.90@2.95
1000 S Utah....10c
70 S Potosi....10c
500 Trojan....10c
95 Utah....14¾@15
440 Union Con....43¾@45½
230 Ward....1½@1.35
200 Woodville....20c
500 Wells-Fargo....5c
275 Yellow Jacket....13¾@13

AFTERNOON SESSION.
800 Addenda....85@70c
900 Albion....20c
275 Argenta....95@90c
1300 Altas....30c
200 Belmont....85c
510 Bodie....10¼@10
350 Belle Isle....2½@2.55
100 Bulwer....9¾
260 Bechtel....1¼@1.55
445 Booker....75@80c
50 Champion....25c
50 C Pacific....6
1360 Day....1@1.05
700 Endowment....70c
560 Grand Prize....1¾
140 Gila....40c
200 Goodshaw....15c
1250 Hillside....1@1.10
25 Independenca....85c
270 Jupiter....1¾@1.40
100 K K Con....4
200 Leeds....45c
100 Manhattan....2.10
470 Martin White....1
175 Metallic....75@85c
90 Mammoth....6
325 Mono....4.60@4½
125 McClinton....40c
150 Mt Diablo....10
1490 N Belle Is....35c
130 Noonday....4¼
130 Northern Belle....6¾@6¼
210 Navajo....40c
300 Paradise....1.20
1000 Queen Bee....35c
100 Raymond & E....1
450 Star....25c
1460 S Bulwer....50@40c
270 Syndicate....3
750 South Bodie....30@35c
340 Summit....90@80c
600 Santa Mina....1.15
250 Tiptop....1.65
250 Tioga Con....2¼@2.35
100 University....10c
90 Wales....3¼
200 W Pacific....40c

Thursd'y A. M., Dec. 4.
415 Andes....65c
405 Alta....3.40@3¼
120 Alpha....8½
1200 Atlantic....5c
260 B & Belcher....14¼@14
490 Belcher....2.20@2¼
575 Bullion....5@4.85
440 Benton....2.30@2.16
50 C Dorado....1½
780 Chollar....7
595 Crown Point....2
1820 Con Imperial....65@70c
940 California....3.80@3.70
380 Con Virginia....4¼@4.30
110 Confidence....7½
415 Caledonia....1.15@1.10
200 Challenge....2
650 Exchequer....3.60@3.40
400 Flowery....25c
450 Gould & Curry....7¾@7½
280 Golden Gate....2
390 Hale & Nor....11@11¼
40 Justica....1.80
620 Julia....1.70@1.65
190 Kentuck....3.10@3¼
200 Lady Bryan....40c
325 Lady Wash....75@70c
100 Leviathan....25c
835 Mexican....22@21¾
2250 Mackey....10c
450 Mt View....2.85@2.70
300 N Bonanza....70c
50 New York....35c
200 North Carson....10c
50 North Con Vir....10¼
310 Ophir....25@24¼
300 Overman....5¾@5¾
20 Occidental....1¼
100 Potosi....3.90
100 Phil Sheridan....25c
415 Savage....8½
515 Sierra Nevada....37@36½
20 Seg Belcher....16@15
450 Silver Hill....1@1.10
520 Scorpion....3.10@3
600 Trojan....10c
85 Utah....15@15½
1115 Union....54@56½
500 Ward....1.45
800 Wells-Fargo....5c
520 Yellow Jacket....12@11¾

AFTERNOON SESSION.
1210 Addenda....60@65c
300 Atlas....25c
800 Albion....20c
1410 Argenta....95@90c
130 Belmont....85@80c
50 Boston....1.40
450 Booker....60c
550 Black Hawk....25@30c
1295 Belvidere....1@1.15
120 Bodie....8¾@8½
675 Belle Isle....1.90@1¾
235 Bechtel....1½
650 Champion....25@20c
850 Caledonia (B H)....3¼@3.70
810 Day....1.10@1.05
755 Eureka Con....18
500 Endowment....85@80c
1200 Gila....20@25c
150 Grand Prize....70c
100 Goodshaw....15c
110 Hillside....1.10
110 Independence....65c
250 Jupiter....1¼
100 Metallic....80c
525 Martin White....70@80c
30 Mammoth....6½
260 Mono....4
510 McClinton....35@50c
10 Mt Diablo....12½
1450 N Belle Is....30c
850 Navajo....25c
255 Noonday....3.60@3.30
660 Northern Belle....6¼@6
100 Queen Bee....20c
100 Rough & Ready....40c
100 Real del Monte....2
140 Raymond & Ely....90c
300 S Bulwer....55c
400 Sta Mina....1.15
500 S Bodie....15c
35 Summit....80c
200 Star....20@15c
400 Syndicate....2.10@2.05
150 Tioga Con....2.10@2¼
245 Tiptop....1¾
280 University....5c
200 Wales....3.05@3

Pacific Board—Latest Sales.

Wed'sday A. M., Dec. 3.
10 Alta....3.60
100 Alpha....8¾
150 Best & Belcher....15¼
20 Belcher....2.40
200 Bullion....5.05@5¼
20 Benton....2½
50 Crown Point....2.15
500 Con Imperial....70@65c
10 California....4.45
50 Chollar....7¼
90 Exchequer....3.65@3.60
20 Gould & Curry....7¾
110 Hale & Nor....12¼
20 Justica....1¾
130 Mexican....24@24¼
80 Ophir....26¼@27
75 Overman....5¾
130 Savage....8¾@9
20 S Nevada....39
120 Scorpion....3.20
30 Silver Hill....1.15
40 Union....59½@61
410 Yellow Jacket....12½@12½

AFTERNOON SESSION.
10 Alphs....8¾@9
65 Alta....3½@3.45
80 Belcher....2.40
60 Crown Point....2.10
490 Chollar....7¼@7¾
500 Con Imperial....70@65c
200 Endowment....85c
130 Gould & Curry....7¾@8
100 Julia....1.80
5 Justica....1.95
400 Mackey....10c
80 Mexican....24¾@24¼
20 Ophir....26½
100 Phil Sheridan....25c
90 Sierra Nevada....41¾@41¼
20 Scorpion....3¼
20 Savage....9
50 Union Con....63@61¼
10 Yellow Jacket....12¾

California Board—Latest Sales.

Wed'sday A. M., Dec. 3.
40 Alpha....8¾@9
130 Alta....3.70
700 Atlas....25c
900 Ætna....1@3c
120 Belcher....2.35
50 Best & Belcher....15¾@15¼
90 Bullion....5@5.15
130 California....4.35@4.30
45 Con Virginia....4.70@1¾
200 Con Imperial....67½c
25 Crown Point....2.15
40 Chollar....7¼
50 Challenge....1.90@1.95
130 Caledonia....1.15
50 Exchequer....3.65@3.60
100 E Sierra Nevada....5c
60 Gould & Curry....8@8¼
30 Hale & Nor....12¾
150 Julia....1.65@1.70
130 Justice....1.85
20 Kentuck....3½
150 L Wash....62½c
20 Mexican....24¼@24¾
50 Ophir....26¼@26¾
30 Potosi....4.15
30 Savage....9¼@9¾
20 Sierra Nevada....38¾@38¾
500 S Utah....5c
900 Trojan....10c
30 Union....59@58¾
100 Wells-Fargo....3c
10 Yellow Jacket....12¾

AFTERNOON SESSION.
20 Alpha....9
30 Alta....3½
1500 Ætna....2c
100 Atlanta....10c
300 Atlas....28@29c
20 Belcher....2.40
20 Best & Belcher....15½@15¾
40 Bullion....5¼@5¼
120 Benton....2.40
1400 Black Hawk....42@47c
20 Con Virginia....4.60
400 Con Imperial....75@70c
30 Crown Point....2.10
30 Chollar....7¼
50 Exchequer....3.90@3.95
600 Enterprise....1¼@1¼

20 Gould & Curry	$	30 Ophir	26¼@26¾
120 Julia	1.80@1.85	30 Sierra Nevada	40½@40
60 Justice	2@1.95	500 Trojan	.80@.70c
50 Lady Wash	.70c	40 Union Con.	.63¾@63
30 Mexican	24½@24¼	20 Utah	.15

Mining Share Market.

The market is in a depressed condition, for which there is probable no better reason than that there is no excitement and very little business. If it would be any help to business, we would be pleased to record the finding of bonanzas in all the mines, but, unfortunately, even such reports do not affect the market. There is plenty of money, but it is not being invested in mines. We apprehend that there is a general lull while waiting for the action of the new Legislature. There is some satisfaction in the dull condition of the market, in the certainty that if manipulators are not making sudden fortunes, the majority are not being scalped. Considerable small money is made in the constant fluctuations occurring in a small way. Many purchase in small quantities and sell on a slight advance, satisfied with a few dollars to meet daily expenses. The New York market has boomed and burst also. Soon we may hear reports of the immense number of mines listed there, but the laugh will be on our side when the scalping begins.

A New Mining Code.

We have received from Messrs. Stone & Co., of Denver, Colorado, a copy of M. B. Carpenter's "Mining Code," being a compilation of all the existing mining, water, pre-emption and homestead laws of the U. S., and the State of Colorado, Mining Decisions of the Courts and Department of the Interior, Articles of Incorporation and By-Laws, forms etc., applicable particularly to Colorado. The work is in pamphlet form, printed in excellent type upon good paper. The contents, however, are worthy of special regard. The mining decisions of Judges Field, Elbert, Thatcher and Hallett, in the important cases which have come before them, form a new feature in a work of this kind. The author says that the opinion in the New Discovery—Little Chief case, and the charge to the jury in the Iron—Grand View case, by Judge Hallett, meet the views of geologists, miners and lawyers familiar with the ore deposits at Leadville, and present the law as it will undoubtedly be applied to the mines of that famous camp. A study of these decisions will enable the miner to determine whether he has a vein *in place*, or a *mineral deposit*, within the meaning of the mining statutes, as these may be regarded as extreme cases of ore deposits in that district. If the locator has the top or apex of a vein or lode "in place" within the meaning of the term, as construed by Judge Hallett, he may follow the dip of the mineral downward beyond his vertical side lines. If he has not a vein or lode "in place," he will be confined to vertical side lines.

Section 2329, Revised Statutes of the United States, includes all forms of deposit excepting veins in place, under the term "placers". One person can locate 20 acres thereof, unless restricted by local regulations.

As the miner in the carbonate districts cannot usually determine at the outset, whether he has a vein or lode "in place," or a "placer," within the meaning of the act, his safest course is to make a location as upon a lode, for he will then hold all within his surface lines, if it turns out to be a "placer," while if he located as a "placer," and it turned out to be a lode, he would, probably not have a valid location.

Perhaps the theory of this advice is good, but in practice it would give but a small "placer," should there happen to be no lode. Still, all of the indications in those districts may point to veins "in place." We hope to be able to refer again to this mining code of Colorado, which we cordially recommend to our readers as containing valuable information.

MINES IN THE EASTERN MARKET.—While it is certain that foreign capital is seeking investment in the mines of the United States, there is considerable caution exercised by foreign capitalists before purchasing. There are more inquiries than ever made about the value of mines now in the Eastern market. Their number is enormous, Arizona alone being reported to have some 1,700 mines for sale in the New York market. It is becoming the custom among foreigners to secure the services of their various consuls in this country to make inquiries concerning proposed mining ventures. These naturally seek information of the Interior Department at Washington, supposing that the standing and prospects of mining companies will be known there if anywhere. It is a matter of regret, however, that the Department has not always knowledge of the company or the mines it is operating. The reason is, many companies having bogus claims have nothing upon which to base an application, and of course there is no record in the Department. Foreigners naturally believe that when the Government records do not show the existence of a company that the company is a bogus one. Although many excellent claims are put upon the market, yet they cannot be sold through lack of satisfactory recommendations.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

BUTTE BASIN.—*Ledger*, Nov. 29: It is thought probable that a new shaft will have to be put down, or a tunnel constructed to get rid of the immense flow of water which prevents prospecting.

KEYSTONE. The sinking operations which were prosecuted in both shafts through the summer are finished. The shaft, which is an incline, now reaches into the earth 950 ft, somewhat more than 500 ft in actual depth. The lowest point from which ore is extracted is the 300 level. The ore is of excellent grade; better, in fact, than has been the average for the last year. The quantity in sight is vast enough to exclude all idea of the exhaustion of the mine for almost a generation. Opening up a new level at 600 ft is progressing.

RED HILL GRAVEL CLAIM.—W. A. Nevills is running his gravel claim at Red Hill, with encouraging prospects. By means of a pipe over 6,000 ft in length, they are enabled to wash the very crest of the hill, thereby bringing a large extent of virgin ground within the scope of mining operations. All the ground worked in that vicinity in early days proved very rich, and all the indications warrant the belief that the balance of the hill will pan out equally well. One day this week from $8 to $10 in coarse gold was picked up on the surface. From 60 to 80 inches of water is all that is required to operate the claim, and the water supply is likely to last till next July.

ZEILE.—At this mine a dozen carpenters are hard at work on the mill. With a couple of weeks of fine weather, the fitting of the framework will be nearly completed. The grading operations are also nearly finished.

LUCKY BALDWIN.—Last week the Superintendent was in Plymouth with some rich ore taken out of the bottom of the shaft, which is down 100 ft. The mill and claim is situated near Big canyon.

NEW QUARTZ MINE.—Figg and Harris have struck a rich quartz mine eight miles northeast of Plymouth, two or three miles this side of the South Fork. Some of the ore, it is believed, will pay $200 per ton.

REPAIRING FLUME.—Last week the Empire mining company had a strong force of hands at work repairing the flume on the big ditch, over the South Fork. The water was turned off some days from the ditch, but the works bad a full supply from the South Fork ditch. There is now about 1,000 inches going down the main ditch, and 500 inches in the South Fork ditch.

ENTERPRISE MINE.—The Enterprise mining company have struck the ledge in their tunnel, and are now in the ledge a distance of 14 ft, but have not as yet found the footwall. The character of the ore is said to be good.

PIONEER.—Two samples of rock from the Pioneer, sent below a week ago, assayed well. One lot went as high as $228.82 per ton. This description of rock, of course, is not wide. The ore body adjoining, from which the other sample was taken, yielded over $10 to the ton.

NEW MINE AND MILL.—The old Frank Walker quartz mill, near Enterprise mine, has been taken down and removed to Montezuma hills, about two miles above Nashville, between the North and Middle Fork of the Cosumnes. The quartz ledges in that section are narrow but rich. Twenty years ago the Harvey Bros. had a mill and mine near the present property, but from some cause it has not been worked lately.

BUTTE.

BANNER MINE.—Oroville *Mercury*, Nov. 29: The ore is yielding at the rate of $50 per ton. The 15-stamp mill completed last week is now in operation crushing about 30 tons of rock per day. The main shaft is already sunk to a depth of 225 ft. In the mine 12 men are engaged in running the main drift on the 200 level and stoping on the ledge; night and day shifts. A six-inch vein of quartz has been struck in the main drift north, which is gradually expanding as the work progresses. Fifteen men are employed above ground. From the mouth of the shaft the ore is taken 150 yards on a tramway to the dump, from whence it is hauled to the mill by wagons. Sufficient material is on the ground to construct an incline plane tramway to the mill, and the improvement is now being made. A comfortable lodging-house, 24x30 ft, has been built by the company for the accommodation of the employees. Though but partially opened, the mine promises exceedingly well. Twenty years ago over $000,000 were realized from 12,000 tons of ore taken from this mine. A singular coincidence in connection with the practical resume of operations in the mine is found in the fact that Wednesday, which was the first full day's work done by the stamps, was the 20th anniversary of the disastrous cave which caused the property to lie idle since 1859.

INYO.

BIG STRIKE.—*Independent*, Nov. 22: By Wednesday evening's stage, we received a piece of chloride and sulphuret lead ore, sent as a fair sample of a new bonanza struck that day in the Indiana, or Boley & Tuttle mine, near Swansea. This specimen is of about five pounds weight, with one broad, perfectly smooth side, showing contact with an equally smooth clayey wall; its assay value is certainly not less than $500 to the ton. The important point to be noticed is, that the meager developments already made show that there is a solid width of just that kind of ore full three and one-half ft wide; this is at the tunnel heading, some 220 ft from the mouth, and about 100 vertically from the surface; the tunnel was run all the way on the ledge. This is doubtless the most valuable strike we have had to chronicle for many a day.

OLD COSO.—*Independent*, Nov. 20: We have it upon the authority of Mr. Lasky, merchant of Lone Pine, that the Mexicans have now running in Old Coso 14 arastras, and all of them producing gold. Old Coso is situated about nine miles westerly of Darwin, and is the oldest mining camp in Inyo county, having been worked as early as '61. It has ever been the resort of Mexicans, and in early days has supplied many a "raise" for some of the toughest citizens that California ever had, more especially when their existence elsewhere was rendered uncomfortable by the authorities. The statistics of the place will never be known. The gold ledges are small and flat, but many in number and extremely rich. Aside from a good opening for a small mill to reduce the ores, the accumulation of tailings furnishes a show for a big "spec" by the concentrating process.

BEVERIDGE DISTRICT.—Besides the works of Messrs. Porter, Hunter & Co., there are in operation at Beveridge district five small arastras working on gold ore, mostly, if not entirely, owned and run by Mexicans. The product, in the shape of pure gold balls varying in size from a bullet to a hen's egg, aggregates, in the average, from $1,000 to $1,200 per week.

MONO.

BECHTEL CON.—The Bodie *News*, of Nov. 30th, contains the following general description of this mine: The 200 level has been opened from the shaft on two parallel veins, designated the east and west veins. The width of the ore channel can be averaged at five ft, with here and there a horse of porphyry, but which does not affect the general size of the vein, nor detract from its continuity. The 300 level north is 340 ft on west vein and south level 162 ft. On the 400 level a drift has been run north 80 ft, showing a magnificent vein of ore, assaying from $80 upward, and a drift south 330 ft, also carrying a four-ft vein the entire distance of good milling rock. From the drift south a crosscut has been run east and the east vein encountered at 41 ft, from whence drifts were started on an ore channel four and one-half ft in width, with not a pound of waste rock. At 200 ft south from shaft, a crosscut run 50 ft east struck the east vein. On the latter vein a crosscut was run west 64 ft and cut the main west vein, whence a drift south has been advanced 30 ft, showing two and one-half ft of solid ore. On the east vein, 100 ft further south, a crosscut has been run west 57 ft, which has again cut the main west vein. A drift south has been run from this latter point, and has now reached a distance of 30 ft, where a winze was sunk, which is now down about 28 ft. Here the vein has increased to a width of over seven ft, carrying fine-looking quartz which will assay well. A drift has been run 195 ft on the 500 level, whence a crosscut was started and run to the east vein, a distance of 68 ft. Here a drift was run south a distance of 63 ft, showing a vein from three to four ft in width. The lowest workings have reached a depth of 700 ft, where water prevents development.

SOUTH NOONDAY.—The main shaft has been sunk in two compartments a distance of 74 ft, and at 70 ft cut through the ledge, which is over three ft in width.

UNIVERSITY. Main shaft now down and timbered 220 ft. Work on skip finished, and is now running satisfactorily, with counter-balance and all apparatus connected with it complete. Notwithstanding the delay consequent on putting in this skip, have made a progress of 10 ft during the week. The formation has not changed, still the most obstinate character of porphyry is impeding operations somewhat, still carrying the seams of quartz mentioned in last report. The machinery about the mine and works is working well, and the best progress possible is being made.

MARYLAND CON.—Since last report a distance of 19 ft has been gained from the station at crosscut. When this station is completed, the company will immediately begin to take out ore from the ledges in the north and south drifts at the 258 level of the old incline. Sinking in the main shaft will continue uninterruptedly in the meantime.

NEVADA.

EL CAPITAN.—Nevada City *Transcript*, Nov. 20: The owners of the El Capitan mine, at the head of Gold Hat, a mile and a half south of this city, are rapidly getting ready to commence the systematic development of their property. The new hoisting works are about completed, and steam will be started up the early part of next week. The incline, which has been sunk to a depth of 50 ft with windlass, shows a two-ft vein of free-milling ore in the center that contains an encouraging amount of free gold and sulphurets. It is 8x5 ft, divided into two compartments, and well timbered with 8x8 inch stuff. A contract has been let for sinking an additional 100 ft on the incline, so as to give it a total depth of 150 ft. The first level will be made at 100 ft, one drift running north and the other south. Three eight-hour shifts are to be kept on, as it is the desire of the company to lose no time in proving their mine. From 15 to 20 men will find employment. The corporation which is known as the New York Gold mining company, and represents Eastern capital altogether, owns the El Capitan, which contains 1,000 ft, the southern extension known as the Clinton and embracing 1,500 ft; also the northern extension for 1,000 ft, called the Wheal Jane. The Crosby and Olive claim of 2,100 ft intervenes between the Wheal Jane and the eastern extension of the Providence Gold and Silver mining company's property. The President of the company, Mr. R. G. Bloss, of New York, is now in this city, and will remain till the works are in operation.

MERRIMAC CLAIM.—The tunnel in the Merrimac prospecting gravel claim, situated next to the Round Mountain mine, is now in 380 ft. Some good prospects are being obtained, and it is thought the pay channel will be developed within a reasonable time. This property is owned by some of the best practical miners in the county.

NORWICH MINE.—Grass Valley *Union*, Nov. 30: This is a quartz location on the east bank of Wolf creek. For several months the owners have been sinking a perpendicular shaft, through bard ground, to strike the ledge, and during the present week, at the depth of about 65 ft, the shaft opened on a 10-inch ledge, which shows finely in free gold and sulphurets. The point at which the ledge was struck is 30 ft below the level of Wolf creek.

BULLDOZER.—*Transcript*, Nov. 27: Two drifts were started Tuesday in the Bulldozer mine, on Deer creek, at a depth of 30 ft. Some promising looking ore is being taken from the ledge, which is from 12 to 18 inches thick. The incline has been pushed down 50 ft. Sinking has been temporarily suspended, but will be recommenced as soon as a good-sized crushing of ore has been taken out.

CENTENNIAL.—A crushing of 80 loads of Centennial rock is now going on at the Orleans mill. It is estimated to go $60 per load. The rock now coming out of the mine is of equally good quality.

NEW YORK HILL.—The incline shaft of the New York Hill mine is down 70 ft below No. 10 level, or a total depth of about 1,120 ft. At the depth of 100 ft below No. 10 a new level will be started, which will be commenced about the 1st of January, as sinking is progressing at the rate of eight ft per week.

PEAVINE ORE.—Truckee *Republican*, Nov. 26: Lee Butts has erected a miniature furnace and smelting works in the rear of James B. Giffen's residence, and has been engaged for some days in testing Peavine ore. His results are extremely satisfactory, and he claims that he can work the rock readily and profitably. His method of working is a modification of the Gould process, and is known only to himself. He claims that he has been at Lake throughout the recent tests of that ore, and has had an important share in the honor of reducing these hitherto rebellious ores. Preparations will soon be made for working Peavine ore on a large scale.

WOOD'S RAVINE.—*Transcript*, Dec. 3: Wood's ravine, near Nevada City, has developed into one of the best quartz mining sections in the county. Prospecting is now going on to discover an old shaft which, in 1850, was abandoned, because it was thought impossible to extract the gold from the rock.

PHŒNIX MINE.—*Herald*, Dec. 2: Work has been commenced on the Phœnix, formerly called the Cunningham mine. The old tunnel is to be reopened, which strikes the main shaft about 210 ft below the surface. The tunnel is about 1,600 ft long. This mine has paid handsomely, and why it was closed down is unknown.

PLACER.

OPHIR ITEMS.—*Argus*, Nov. 20: Bowen, Hillman & Co., of the old Scott claim, on John Woodward's ranch, about a mile southwest of Ophir, are crushing some very fine rock this week. They have over sixty tons of it, and it will pay probably as high as $35 a ton, if not more. Tremolling Bros. are also taking out some excellent rock from their mine at Humbug Flat, on the old Bellevue lead. Their last crushing averaged over $66 per ton, and the quartz they are getting is still richer.

DUTCH FLAT.—The *Forum* says: The first blast of the season was fired at the Polar Star claim a few days ago. It was an entire success, loosening up a large quantity of dirt. The drift was in 50 ft, and contained 8,250 pounds of Judson powder. Washing will commence as soon as a sufficient supply of water can be obtained. Only two mining claims have done anything at washing yet—one of those belonging to the Cedar Creek Company and Mr. J. H. LeKamp's. Several others are fitting up, hoping for early rain and snows. A good mining season is pretty generally expected.

BIG RIVER STRIKE.—*Herald*, Nov. 29: Some time ago we referred to a strike having been made by R. Boles, near Rattlesnake Bar, on the American river. We learn that John McBride is an equal partner in the claim with Boles, and we are glad to know it is so, for they are both worthy and industrious men. It seems they have struck a bench of new ground, which, by the way, is quite extensive. In thirteen days the two took out about $7,000, and then the rain came and drove them out.

SIERRA.

RICH ROCK.—Bodie *News*, Nov. 30: Some marvelously rich ore was recently struck in the Ketuon mine at Alleghany, Sierra county, California, and 1,000 pounds of it has been taken to Nevada City for reduction. It is very heavy in arsenical pyrites, but shows no free gold. Assays made show that it contains over $21,000 worth of gold per ton.

NORTH FORK.—Downieville *Messenger*, Nov. 29: The Secretary of this company, Platt Ketchem, informs us that his men are driving off northeast and entering some very fair gravel that prospects about two dollars to the car, with heavier wash and larger boulders than heretofore. The main tunnel is being put in good shape for winter operations. Seventy-five car-loads of pay dirt is thrown into the dump every day.

NEVADA.

WASHOE DISTRICT.

OPHIR.—Gold Hill *News*, Dec. 3: During the past week the main incline has been sunk and timbered 15 ft, and is now 171 ft, on the slope, below the 2400 station, passing through very favorable vein matter containing quartz giving low assays.

UNION CON.—On the 2400 level the east drift has been advanced 26 ft, making a total length of 54 ft in ore, and still showing high-grade ore in the face. They are now extracting ore from this level at the rate of 100 tons per day, which quantity will be increased as the bob and tank pits in the Union shaft are completed. The total amount of ore extracted to date is 1,182 tons, of which 337 tons have been shipped to the mill, leaving 845 tons in the ore house.

SIERRA NEVADA.—North drift on 2200 level is now in a distance of 94 ft from the station, the face showing a very favorable formation of clay, porphyry and quartz, giving low assays. The face of this drift is about 650 ft north of the incline. The ore stopes on this level are yielding 35 tons per day of good ore. They could take out more if they had the facilities for handling it. On the 2300 level the north drift is now in a distance of 30 ft. At this point a drift has been started east for the purpose of proving the vein in that direction. The west crosscut on this level is in a distance from the station of 70 ft. A drift has been started north on the ore vein, which is now in a distance of 18 ft, the face showing ore of fair grade.

CALIFORNIA.—East crosscut, from main drift, is now in 20 ft, and shows favorable-looking vein matter in the face. On the 2250 level the north drift from the C & C shaft has been extended 33 ft; total length, 118 ft. It has not yet reached the ore vein found on the 2150 level.

SAVAGE.—During the past week the crosscuts on the 2200 level have been advanced. No. 1, 33 ft, total 126 ft; and No. 2, 24 ft, total 102 ft. In crosscut No. 1 they have passed through 48 ft low-grade quartz, and in crosscut No. 2, 72 ft, and the face still in quartz. The south winze, 2200 level, has been timbered 20 ft. The tank drift, 2200 level, has been advanced 13 ft; total, 40 ft. The water stands about 15 ft below the 2200 level.

HALE & NORCROSS.—Work on the 2100 level has been temporarily suspended. On the 2200 level crosscut No. 2 is in 50 ft, showing occasional seams of ore. The south drift has been cleaned out 128 ft. The Savage company stopped sending water to the pump of this mine last night, reducing the temperature to 28 degrees Fahrenheit, which will greatly facilitate work on this level.

MEXICAN.—On the 2000 level the joint Union Con. west crosscut on their north line has been advanced 30 ft through vein porphyry and clay streaks; total length from the main drift, 320 ft. The joint Union Con. winze has been sunk and timbered 14 ft, and is now 204 ft in depth below the 2000 level, continuing in a vein matter showing some water.

MOUNT ROSE DISTRICT.

MOUNT ROSE.—*Silver State*, Dec. 2: The Mount Rose, under the management of Capt. Rawlings, is proving to be one of the best mines in Mount Rose district. The ledge is large, rich and well defined at the greatest depth attained.

BIG PRIZE.—This mine is improving. Two shifts are at work on the vein, which has been found beyond the break. The ledge is not so rich as it was near the surface, but its appearance indicates that it will be, ere long, as large and rich as it ever was.

COMO DISTRICT.

MARY WILDER.—This mine, six miles west of Paradise village, continues rich as far as prospected. A shaft is down about 12 ft on the ledge, and at that depth there is a streak of ore about a foot wide that assays from $800 to $1,200 per ton.

HOT CREEK DISTRICT.

RICH FINE.—The new mines discovered last week, near the Hot Springs mine, 12 miles east of Paradise village, are said to be very extensive. There are immense masses of quartz on the surface, some of which assay $600 to the ton in gold and silver.

BELMONT DISTRICT.

BELMONT.—*Courier's* last report says: Since last writing you we have commenced stoping in north part of mine on the largest body of ore opened up in mine for several years. This body of ore is eighty feet in length. We have cut through it with Nos. 2 and 3 raises and found it over forty feet wide in both. Our ore body south of shaft is also looking fine and producing rich ore. We are extracting now some 40 tons of ore per week, and as soon as we get the necessary repairs made on mill, which will take us until the 25th of present month, we will put on a larger force of miners and take the ore out faster. I shall start hauling ore to mill the coming week, and commence working same as soon as mill is ready. We have also commenced the erection of a 10-stamp battery at mine to concentrate our low grade ores, of which we have several thousand tons in sight in mine that assays from $15 to $40 per ton.

OLA.—Superintendent Cooper's report is as follows: We have sunk our north winze 12 ft, making total depth below 300 level 57 ft. Sills and track down in good shape. The ledge in front and overhead shows the same strength it has since we started the winze. We are following down the footwall, leaving the whole ledge overhead, and wherever it is broken into it shows very lively and good-looking quartz. Next week we will start a crosscut from bottom of the winze to test the thickness of the ledge and prove the character of the ore.

MARIETTA DISTRICT.

ENDOWMENT.—Esmeralda *Herald*, Nov. 29: The furnaces are now able to properly chloridize the ore. There is now at the mill and on the dump at the mine upwards of 500 tons of ore. On the 200 level there is a breast of solid ore averaging 4½ ft in width with average assays of $211 per ton, four men being able to take out fifteen tons per day. On the 300 and 400 level the width of the vein is 13 inches of a much higher grade, going $302 per ton. These levels lack about 20 ft of being under the large chimney of ore on the 200 level. Thus there is over 200 ft of virgin ground from which to stope, besides that above. The ore in sight at the present time in the Endowment will keep the mill running to its full capacity for at least six months. The winze from the 400 level is also being sunk in excellent ore, fully equal to that above, and is going down at the rate of three ft per day.

I. X. L. DISTRICT.

ITEM.—Winnemucca *Silver State*, Nov. 28: Eurekans are taking a great interest in the I. X. L. district, in Churchill county. Several miners who have just returned from the camp inform the Eureka papers that it is by far the largest and most promising mineral belt ever discovered on the about 20 ft of being under the large chimney 20-stamp mill erected there, and the several mine owners are willing to enter into a contract to keep it running for two years. S. C. Kellogg, who discovered the district, offers to anyone who will erect a mill there 1,000 tons of ore, the average assay of which is $150 per ton.

ARIZONA.

CHEAP MILLING.—The Arizona *Sentinel* of Nov. 29 says: Mr. F. D. Welcome has been down from the Picacho mill this week and reports everything working smoothly. They are working a breast of ore 40 ft wide, all of which, except a saide or horse in the middle about three ft in width, is being milled. The expense of milling is $1.25 per ton, which seems as economical a figure as any mill can show.

PIMA COUNTY.—We learn from the *Star* that new and rich discoveries have been made in the Santa Rita mountains, Pima county. The first was made by Sam Katzenstein, Postmaster at Oreaterville. Mr. Hilton's St. Lawrence mine, from which the $29,000 assay was recently

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Quinn Mine, Lyon County, Nevada.

A late *Territorial Enterprise* gives an account of the Quinn mine, in the above county, which contains rich silver ore, and which is now about to be properly opened. The history of the mine is substantially as follows:

Nearly 20 years ago, Patrick Quinn discovered and located a lode in Spring valley, below Silver City, which was found to be very rich in silver at the very surface—in the grass-roots, as one may say. At the time there was much talk and good deal of excitement in regard to the find, for silver ore was something new in that region, all the veins being gold bearing, but as Mr. Quinn was not able to open out his mine on a large scale, and tenaciously held on to it and worked it in his own way, other excitements withdrew the public gaze and Mr. Quinn and his mine were soon forgotten, or only remembered by the few who formed his little world.

As we have said, Mr. Quinn has worked the mine all these years in his own way, and his way was much after the fashion of Mexican mine owners. He has a comfortable house near the mine, and there he has lived and supported his family, digging the ore from his mine by trenching along on the surface and grinding it in an arastra, or sometimes getting some acquaintance to work small lots of it in a pan, he screening out the fine dirt for this purpose.

A year or so ago Col. F. F. Osbiston and Dr. Bronson obtained a controlling interest in the mine and intended opening it up at once in good shape, but the Sierra Nevada, Leadville and other excitements diverted their attention from time to time, and besides they did not then know the real value of the mine.

All this time, however, Mr. Quinn (although the control had really passed from his hands) was digging away at the mine more or less, as he was bound to get a living out of it, and had laid bare the ore in a number of places. At odd times Mr. Quinn put in considerable work on a shaft, and from this has taken out a considerable amount of ore, as it was sunk on the vein. This shaft finally attained the depth of 80 feet, when water was encountered, and Mr. Quinn was at the end of his string, for he could make no heading with an ordinary bucket and windlass, when he had to take out 10 buckets of water to one of ore, which at last came to be the case.

The vein has widened from three to four feet at the surface to twelve feet at the bottom of the shaft. From the very surface it has well-defined foot and hanging walls and the regular Comstock pitch to the east. The hanging wall is very handsomely shown in a tunnel that runs under the main road leading to Carson. It is very regular and as smooth as though it had been plastered. In an open cut to the southward the footwall is shown, and it is well defined and almost vertical. Next to this wall, from the very surface down, is to be obtained fine milling ore.

Dr. Bronson is now sinking a new shaft to the northward of the old one and to the eastward of the vein. This shaft is of two compartments of the usual size and is neatly and substantially timbered. It is the first work that has ever been done on the mine in anything like shipshape. The shaft was started on the first of the present month, and has attained a depth of 65 feet. It will be sunk to the depth of 100 feet, when a crosscut will be run west into the ledge, though we are of the opinion that the ledge will so widen that the shaft will cut through the hanging wall at the depth mentioned. In the bottom of the shaft is a feeder over a foot in width, which is making west and which is metal bearing, assaying from $3 to $5.

The ore does not look at all like the ores at this end of the Comstock. It varies in color from a dull yellow to a rusty red, and looks like material wholly gold bearing, yet silver largely predominates in even the reddest of it.

In the old Mexican mine, about the 300 level, were found streaks of this yellow-looking ore, and in it, as in this of the Quinn mine, small flakes of native silver were frequently found.

Samples were carefully assayed by Wiegand & Co., and the following are the results: No. 1, $35.17 gold, $66 silver; total, $101.17. This was the average of a large pile of ore taken out of the 80-foot shaft, the bottom of which is now filled with water. The sample was taken from a dozen places on all sides of the dump.

No. 2, $79.94 gold, $14.40 silver; total, $94.34. This was from the bottom of an open cut six or eight feet in depth, and on the flat ground a considerable distance south of the shafts.

No. 3, $33.58 gold, $493.80 silver; total, $527.38. This was a piece of very hard quartz of a grayish hue with a considerable tinge of green in seams, and with small specks of black peppered over it. While hammering at it to break it and get a pocketable piece, we were assured by both Dr. Bronson and Mr. Quinn that it was of little value. They said it was altogether too hard and flinty.

Not satisfied with our own assays we obtained several of the samples taken by parties who visited the mine a few days ago.

A sample from the dump mentioned above, taken by Samuel L. Jones, Superintendent of the Crown Point, showed $62.83 silver and $32.64 gold; total, $95.47.

A selected piece taken by Mr. Jones went $392.60 silver and $52.28 gold; total, $444.88. A sample from the waste dump assayed $20. His sample from the open cut went $82.20 silver and $18.40 gold; total, $100.60.

Mark Strouss had an assay made of a sample from a drift in the old shaft (covered with water at the time of our visit) which gave $43.60 silver and $20.78 gold, or a total of $64.38. Mr. Augustine, from the waste dump, $21.19 silver and $12.55 gold, or a total of $33.74.

James R. Field, from the dump, $190.10 silver, $66.15 gold; total, $256.25. H. Crandall, specimen from dump, $626.95 silver, $159.08 gold; total, $785.43. Mr. Gowan, of San Francisco, from dump, $137.53 silver, $47.57 gold; total, $185.10; from waste dump, $47.

From these samples it will be seen that the Quinn mine is not only remarkably rich, but also very rich in silver. At depth it will undoubtedly be found to contain a large bonanza. It is evident that a large and rich ore chimney has at this point pushed its way to the surface. As evidence of this we would call the attention of mining men to the huge mass of vein matter that has been pushed high above the surrounding surface at a point about 100 feet north of where the new shaft is going down. This rugged mound of vein matter forms a noticeable feature of the landscape, and ever since the settlement of the country must have been observed and remarked upon by all traveling that way between this city and Carson.

The Quinn mine will be found to be on the true line of the Comstock. Its course northward is first to the mine where stands the old mill built by Gen. Thomas H. Williams on a mine worked by him, the precious metals found in which now repose in his tailings' dump; thence to the Kossuth, Dayton, Succor, Forman shaft and Yellow Jacket new shaft. From the hill north of the Quinn the works of all these companies will be found to be in a direct line north and south.

Presence of Mind.

A singular accident, attended with a remarkable display of presence of mind, occurred a short time ago at Dr. Buelow's quartz mine five miles east of Nevada City, California, which is thus spoken of by the *Transcript:* G. H. Kirchhacker, a middle-aged man, had put in a blast at the bottom of the shaft, which is 80 feet deep, and then after lighting the fuse gave the men at the windlass the signal to "hoist away." When the bucket he stood in had been hoisted to a point about 30 feet from the surface, a splice in the rope gave way, and Kirchhacker was precipitated a distance of 50 feet straight down into the lower depths. Strangely enough the force of the fall did not render him insensible, although he was stunned for an instant. One ankle was dislocated, a knee-pan hurt, neck cut and other slighter injuries received.

Almost as soon as his downward course was checked, he realized the fact that but a few seconds would elapse before the explosion of the blast, and his consequent annihilation, unless he took immediate measures to save himself. He managed to draw his maugled body over to where the fire was creeping down to the heavy charge of powder beneath. No time was to be lost. Grasping the burning fuse, he summoned up his remaining strength, and drew it out from the tamping.

His companions on the surface were in an agonizing state of suspense for a few minutes. When several moments had elapsed and no explosion followed, they started down for the purpose of getting the remains of the victim, whom they supposed had been dashed to pieces. Their surprise and joy was unbounded at finding him alive. He was hauled up, and Dr. Buelow at once sent for. So far as yet ascertained he received no internal injuries, and will be as well as ever again in a few days.

Darius' Tomb.—Among the most remarkable tombs of the ancients may be noticed the sepulcher carved out of the living rock by order of Darius, the warrior and conqueror King of Persia, for the reception of his own remains, and which is existing to this day at Persepolis, after a duration of 23 centuries. The portico is supported by four columns 20 feet in hight, and in the center is the form of a doorway, seemingly the entrance to the interior, but it is solid; the entablature is of chaste design. Above the portico there is what may be termed an ark, supported by two rows of figures about the size of life, bearing it on their uplifted hands, and at each a griffin—an ornament which is very frequent at Persepolis. On this stage stands the king, with a bent bow in his hand, worshiping the sun, whose image is seen above the altar that stands before him, while above his head hovers his ferouher or disembodied spirit. This is the good genius that in Persian and Ninevite sculpture accompanies the king when performing an important act. On each side the ark are nine niches, each containing a statue in bas-relief. No other portion of the tomb was intended to be seen, excepting the sculptured front; and we must, therefore, conclude that the entrance was kept secret, and that the avenues were by subterranean passages so constructed that none but the privileged could find their way. We are told by Theophrastus that Darius was buried in a coffer of Egyptian alabaster, and also that the early Persians buried their dead entire, preserving their bodies with honey or wax.

Ancient America.

Dr. J. M. Peebles, in a recent lecture in San Francisco upon the above subject, took occasion to say that his face once crimsoned in Egypt when asked by a scholarly native engaged in the Cairo Museum how the buried and half-buried cities of Central America and the pyramidal ruins of Yucatan and southern Mexico compared with those of Egypt. The lesson was: "Visit and study the wonders of your own country before traversing foreign lands." The speaker pronounced the railroad from Vera Cruz to the City of Mexico a splendid specimen of engineering. The Aztec Anahuac, the vale of the Montezumas, has an area of some 600 square miles. It was the sunny home of the old Aztecs. The Aztec and Toltec relics preserved in the City Museum of Mexico were intensely interesting, inasmuch as they established the fact of maritime relations and inter-oceanic intercourse between the Toltecs and the Phœnicians and Egyptians. As the Lamentian rocks, far to the north of us, constitute the oldest range of rocks in the world; as Cholula is considered the oldest pyramidal structure known, why may it not be true that this is the old world, and that the Egyptians learned pyramid-building from the ancient Americans of this continent? "I saw," said the speaker, "carved upon templed ruins in Yucatan, hawks' and other birds' heads similar to those upon the temples, tombs and obelisks of Egypt. Among the ruins of Uxmal and Palenque I saw the carved cross and the same phallic symbols so common in India, Phœnicia and the East; and I further saw the chiseled serpent, the mummy-shaped sarcophagus, the winged rod and the lamp immortal, so frequently seen in Egyptian tombs and temples. Few men of research doubt the existence and sinking of the Atlantis Isle; doubt that there were commercial relations in ancient times between this country, Toltecs probably, and the old nations of Europe and Asia. Strabo, living before Christ, said 'that the art of night-sailing was taught in ancient Tyre.' This indicates a knowledge of the mariners' compass. Possibly the second expedition sent out by Necho II, an ancient Egyptian king, reached this continent. The first expedition of this king sailed down the Indian ocean, doubled the Cape, and entered the Pillars of Hercules. The ancients in some respects equaled if not excelled us. The Aztecs conquered the Toltecs and then adopted more or less of their arts and sciences. The calendar stone that now rests against the side of the Roman Catholic Cathedral in the City of Mexico is a Toltec rather than an Aztec production. Is it asked, 'Who were the Toltecs?' They were the descendants of the Nahuas, and this was a conglomerate nationality, made up of the autochthonic races and the remnants of those who peopled the Atlantis Isle. Traveling in Yucatan is hardly safe and very inconvenient. Merida, the capital, has but one hotel, and that is kept by a Spaniard. It is 65 miles from Merida out to Uxmal. The Maya Indians in these regions are friendly, but the southern tribes are warlike."

Globe District, Arizona.

The speedy completion of the Southern Pacific railroad and its connections, will furnish what is most needed to properly develop the wealth of Arizona, viz: transportation. The great hardships and deprivations that have been suffered by the pioneers in that mining Territory deserve some recompense for their stout-hearted perseverance. The mines are looming up, and if all of the districts are as flattering as Globe district, there need not be any fears of ultimate success. Mr. F. A. Wilder, writing to the *Silver Belt* of Nov. 22d, says: We have seen ore that was taken from the Stonewall Jackson shaft at a depth of 300 feet, which is estimated will assay $10,000 per ton; have also seen a specimen of native silver from same mine, purer than the current coin of the realm, which confirms Wordsworth's statement, that "true beauty dwells in deep retreats." These specimens can be seen in Eaton & Bailey's cabinet.

The Duryea mill has contracted with Moore & Trout for 500 tons of Chromo ore. One hundred tons are already on the dump. It looks well. The mill is being re-fitted with new machinery, a crusher, an automatic feeder, two additional pans and settlers. A new mill building is being erected. The capacity of the mill when completed will be 12 tons. It will be in operation in about six weeks.

In regard to the Silver Nugget, Mr. W. estimates the shaft at 50 feet in depth. The past week a new crosscut was started from the west drift, northerly, has advanced some eight feet, developing, at this point, a vertical vein; its direction, or strike, being nearly east and west. The gangue is granular quartz, containing disseminated crystals of feldspar mineralized with chloride, sulphide and arsenate of silver. The latter not purely a ruby stained ore, but allied to it so nearly that it may be said to approximate such. I do not know the assay value of this ore, but from its appearance to-day, presums it will pay largely to mill. The indications of the vein promise a strong one.

Also the East Richmond is a valuable mine. It is upon the main vein of the Richmond proper, adjoining the Mack Morris, westerly. The vein has been traced from the eastward of the La Plata, or old McDowell claim, through it, the Mack Morris, and the entire Richmond locations, thus constituting, I think, the center lins of the several claims, with 300 feet on each side, as the width thereof. The size of this vein, as indicated at the surface, is over 12 feet, and its outcrop is seen at intervels along the entire line, as mentioned above. To the northward its enclosing wall or country rock is syenite and syenite gneiss. To the southward the country rock is porphyritic granite. At the center of the ground, distant about 700 feet westerly from the Mack Morris, a working shaft has been sunk to the depth of nearly 50 feet, its south line following, as is supposed, the footwall of the vein. From surface to bottom of shaft ore has been taken. At 25 feet a drift easterly, following the strike of the vein, is now being run, seven feet in width and six and one-half feet in hight, and at this date 18 feet in length. Every part of this drift is in ore, its floor, roof, sides and face yielding a gangue strongly mineralized with chlorides, sulphides and arsenate of silver, diffused with much uniformity. The present appearance of the vein gives promise of a large quantity of ore. Appended is the result of eight assays from the vein gangue, taken from different parts, only one being a selected specimen. Assays of ore average $1,245.54.

Astronomical Causes for Rainy or Cold Summers.

In reply to an inquiry, one of our Eastern exchanges expresses its common-sense views upon the above subject: There can be no astronomical causes for rainy or cold summers, for the simple reason that they do not extend over the whole earth, but are merely local. If there were an astronomical cause, the effect would be general over the whole earth; but what do we actually find? Take the most recent peculiarities of the weather—while we in the United States had very dry and warm weather in October, there was in Spain an over abundance of rain and very destructive floods, by which millions of dollars' worth of property was destroyed and hundreds of persons perished, while in Austria it was very cold, and Vienna was inflicted with snowstorms.

A few years ago, when we had a very cold and wet summer, and some of our would-be scientists were discussing the great number of sun spots as a cause, we called attention to the fact that, according to reports from Europe, the weather there was very hot and crops suffering from want of rain. We hold that the total amount of evaporation and rainfall averaging over the whole surface of the earth is very nearly a constant quantity, and sun spots do not diminish solar radiation; and if they did, they would diminish the evaporation, and consequently the rainfall, instead of increasing it, because all the water that descends must have first ascended by solar heat, and what has been taken up will come down somewhere. If now, by a series of circumstances, some part of the earth's surface gets more than its usual share at the expense of another part, people commence at once to reason about astronomical causes, without first investigating whether the whole earth suffers in the same way. There is an important fact which proves that if much rain falls in one region it must be carried there from other regions where the weather is clear, and an amount of evaporation takes place adequate to supply that excessive rain; this fact is that if the total amount of watery vapor which the atmosphere can hold were to descend at once over the whole terrestrial surface, it would only amount to four inches, and raise the surface of the ocean as much, but as one-fourth is land, from which it would flow to the ocean, it would cause the ocean to raise its level about five inches.

Flexible Sandstone.—A few days ago Mr. C. A. Hege, of Salem, North Carolina, exhibited to us a specimen of sandstone from that State, which possesses remarkable properties. A whole mountain in Forsyth county is composed of this stone. It is found in strata ranging from one-fourth to three-fourths of an inch in thickness, and is of fine grain and light gray color. The most singular feature is its flexibility. The specimen shown us was ten inches long, one-fourth of an inch thick, and nearly one and a half inches in width. It could easily be bent, and did not appear to be at all brittle. The application to an emery wheel affects it but little. It is perfectly fire-proof, and will serve an important part in the industrial arts as lining for furnaces, grates, etc., owing to its adaptability to conform to round surfaces, or to the shape of the grates. The existence of this bed of sandstone has been known only a short time. An old hermit living at the foot of the mountain discovered it years ago, and produced specimens as a curiosity. The inhabitants, suspecting that he found the rock in this form, followed him and discovered the secret. Near the surface of the ground the rock is very hard, but farther down it can be easily removed, and becomes very flexible.—*American Inventor.*

Explosion of Fire Arms.—Fire arms frequently burst when the muzzle has been accidentally closed with earth, snow, etc. Prof. Forbes' explanation of this fact is very simple. If the charge moved slowly, a very slight pressure of the air in the barrel would be sufficient to clear the muzzle, but as the charge actually travels with a speed greater than the velocity of sound, the resistance offered by the obstacle becomes excessive and the gun bursts. It has been demonstrated mathematically that the pressure generated by a plug of the density of air is seven and a half tons.

The Engineer.

An Important Engineering Scheme.

While our exchanges are full of the international project of connecting the waters of the Atlantic and Pacific oceans by means of a canal, a scheme is on the cards for effectually draining and reclaiming the fertile marsh lands of Yolo, Solano and Sacramento counties by means of a canal fifty miles long, which will also control the Sacramento river during floods.

Col. Smith, Chief Engineer of the Harbor Commission, and also engineer of the Sacramento River Drainage District, to which he was appointed by the Board of Commissioners established by an act of the last Legislature, approved April 1st, 1878, is at work upon his report to the latter Board, which was established for the purpose of draining the surplus waters of the Sacramento river and the waters flowing from the east side of the Coast range of mountains, in the counties of Yolo and Solano, into Suisun bay—an object to be effected by the construction of a main canal, leading from the Sacramento river at Charleston, or Gray's bend, in the vicinity of Knight's Landing, Yolo county, running in a southerly and southwesterly direction to the basin of Nurse's slough, in Solano county, and thence to Suisun bay, through Montezuma slough, an entire length of about 50 miles, and at a distance of from five to ten miles northwest of the Sacramento.

The waters from the Coast range of mountains from Cache creek southerly are to be diverted and turned into the canal; and an auxiliary canal, leading from the Sacramento, near the mouth of the American river, to the main canal, is to be constructed if necessary. The Commissioners appointed are, Mr. Egbert, of Oakland, and Messrs. Cary and Knox, of Sacramento. According to the terms of the act, the engineer must make a preliminary survey and reconnoissance for the purpose of ascertaining the feasibility and effectiveness of the proposed work, and its probable cost, and make a full report to the Board. An appropriation of $10,000 was made for the purpose of paying the expenses incidental to this survey. The estimated cost of the undertaking is placed at $2,000,000, or an assessment of not more than $5 an acre on the total amount of lands to be benefited in the district, which is roughly estimated at about 400,000 acres. In the event of a favorable report, bonds for the amount are to be issued, payable in 20 years and bearing 7% interest per annum, payable semi-annually. Col. Smith has devoted much time to the consideration of the scheme, and has consulted every authority of note upon the subject of rivers, which is found to be one of the most difficult that engineers are called upon to wrestle with.

Whatever may be the difficulties they will undoubtedly be overcome. The skill of our engineers has never been at a loss to accomplish calculated results. As one of our daily exchanges says, however, the feasibility of constructing a canal large enough to receive all the surperfluous waters of the Sacramento during flood seasons, and also the waters from the Coast range through Putah and Cache creeks, is a consideration that will tax the mind of the best engineers for solution, especially when it is borne in mind that the only available data at all reliable are observations of the State Engineer, which extend over a period of little more than a year. This difficulty once overcome and the greater portions of Yolo, Solano and Sacramento counties will be effectually reclaimed and enhanced in value many millions of dollars.

The main canal will be above the level of the surrounding country nearly its entire length, and must be built securely enough to hold all the waters of the district without danger of overflow or breakage, which would inundate the land and reduce it to its former condition, thereby rendering the entire project a failure. The bed of the canal will be on a level with high water at the point of junction with the Sacramento, so that when the river rises the water will rush into the canal. On reaching the Montezuma hills, a cut will be made through them nearly four miles long. Thence, the canal will extend to Montezuma slough, through which it will flow to Suisun bay. It is improbable that any injury will result to the land in the vicinity of Montezuma slough, because it is at present subject to tidal overflow. On the contrary, it is quite probable that the velocity of the waters flowing through the canal will be so great, that when they enter the slough they will broaden and deepen it, thus affording better facilities for draining Grizzly island, preparatory to building levees for protection against the tides. The matter of damage to the land in the vicinity of the mouth of the canal is a point to which the engineer's attention is especially directed by the Act.

Col. Smith is very reticent about divulging anything relative to the decision arrived at in his report, until he shall have forwarded it to the Commissioners. Nevertheless, it is quite likely that he will report favorably upon the scheme, notwithstanding the gigantic obstacles in the way. Upon due consideration, they do not appear to be absolutely insurmountable. Should he declare in favor of any radical modifications, the project would be abandoned by the Commissioners without submitting it to the people, as the act requires in the event of a favorable report.

Useful Information.

A New Compound for Making Casts, Molds, Etc.

Our exchanges bring us an account of a new cement known as Jannin's cement, from the name of the patentee, a resident of Paris. The cement is simply a mixture, in suitable proportions, of yellow oxide of lead (the quality known as massicot being preferable) with glycerine. Several other metallic oxides and matters may be mixed with the cement, so as to suit the quality or the color of the cement to the nature of the work to be produced, but the two essential compounds are yellow oxide of lead and glycerine, varying according to the consistency of the cement it is desired to produce. The proportion of glycerine is larger for a very soft cement than for a stiff cement. The exact proportion of each of the two essential compounds are not specified. The paper from which we make our extract says that this cement is specially adapted for molding those objects which require an extreme delicacy in the lines of the cast, such as engraved blocks and plates, forms of printing type, photoglyptic plates, etc. Under the influence of gentle heat it sets in a few minutes, and then resists perfectly both pressure and heat. When set, it is also a very good substitute for natural lithographic stones, and it can replace them for many practical purposes. It can also be used for artistic reproductions, such as *fac similes* of terra cotta, whose color and sonorous quality it possesses. Though setting to great hardness in a few minutes, it does not shrink. Massicot, it may be observed, is an old name for litharge, but the term is more generally applied to the yellow oxide of lead, prepared from the scum of the molten metal by roasting until the color is fully developed.

A mixture of litharge and glycerine forms a well-known cement, discovered, if we are not mistaken, some 10 or 12 years ago in this country by Dr. P. H. Van der Weyde. As a plastic material, however, it is a novelty. We doubt very much whether as a substitute for lithographic stones it will come into use. It is strong and hard and sets rapidly. Some attention must be given to the quality of the glycerine, which must be nearly pure, at least, to form a good cement, capable of setting quickly; it must be free from water and quite thick. We suppose the thick purified article to be found in the drug stores would answer. It is possible that the quality known as crude would answer just as well except for the presence of water. The discovery of the value of this compound as a cement was rather a matter of accident. Dr. Van der Weyde wished to seal a glass stopper into a bottle, so that it would remain perfectly tight, and yet be easily removed when desired. Not wishing to use wax, the material commonly employed for the purpose, he took some litharge, and, mixing it with glycerine, applied it around the stopper. It answered one portion of the requirements of the case perfectly, and the contents of the bottle were kept from leaking, but the doctor found, when he came to empty the bottle, that bottle and stopper were as firmly united as though they had been made in one piece, so that it became necessary to break the neck of the bottle to get at the contents. It is needless to say that it was not again used for that purpose.—*Iron Age.*

The Gelatine Copying Process.

The following is a simple description of the new gelatine process: Write with a steel pen on ordinary writing paper; allow to dry; press the writing gently upon the tablet, allow it to remain a minute, when the greater part of the ink will have been transferred to the gelatinous surface, and as soon as the paper has been removed the tablet is ready to take impressions from. Place ordinary writing paper upon the charged tablet, smoothing over with the hand, and immediately remove the sheet, which will be found to bear a correct copy of the original writing; repeat with other sheets until the transferred ink becomes exhausted. Immediately after, wash the tablet with water and a sponge, let it dry and it is ready again for use. With a tablet and ink prepared according to the following, 50 good copies from one transfer have been obtained, and doubtless with care it would afford twice this number. The proportions for the pad or tablet are: Gelatine, one ounce, glycerine, six and one-quarter fluid ounces. Cooper's gelatine and pure concentrated glycerine answer very well. Soak the gelatine over night in cold water, and in the morning pour off the water and add the swelled gelatine to the glycerine heated to about 200° Fahrenheit over a salt-water bath. Continue the heating for several hours to expel as much of the water as possible, then pour the clear solution into a shallow pan or on a piece of cardboard placed on a level table and having its edge turned up about one-eighth of an inch all round to retain the mixture, and let it remain for six hours or more, protected from dust. Rub over the surface a sponge slightly moistened with water, and let it nearly dry before making the first transfer. The ink is prepared by dissolving one ounce of aniline violet or blue (2 R B to 3 B) in seven fluid ounces of hot water, and, on cooling, adding one ounce of wine spirit with one-quarter ounce of glycerine, a few drops of ether and a drop of carbolic acid. Keep the ink in a well-stoppered bottle.

Chinese Method of Welding Cast-Iron.—The Chinese process of welding cracked iron wares by cementing them with molten iron is thus described: In the case, for example, of a cast-iron pan requiring such treatment, the operator commences by breaking the edges of the fracture slightly with a hammer, so as to enlarge the fissures, after which the fractured parts are placed and held in their natural positions by means of wooden braces; the pan being ready, crucibles made of clay are laid in charcoal and ignited in a small portable sheet-iron furnace, with bellows working horizontally. As soon as the pieces of cast-iron with which the crucibles were charged are fused, it is poured on a layer of partly charred husk of rough rice previously spread on a thickly doubled cloth, the object of this being to prevent the sudden cooling and hardening of the liquid metal. While in the liquid state it is quickly conveyed to the fractured part under the vessel and forced with a jerk into the enlarged fissures, while a paper rubber is passed over the obtruding liquid inside of the vessel, making a neat, strong, substantial, and in every respect thorough operation.

Bleaching Feathers.—A new method is said to have been devised for bleaching feathers, which, it is thought, will supersede those methods now and previously resorted to. This improved practice rests on the interesting fact that feathers immersed in resinous essences—such as turpentines and other hydro-carburetted oils from distillation of resinous juices in general, or in like oils, in lavender, thyme, etc., or in bituminous hydro-carbons—are discolored under the action of light and heat. The feathers, especially ostrich plumes, are kept in the vessels a longer or a shorter time, according to the degree of bleaching intended, at about 86° Fah., while exposed to light as much as possible. In three or four weeks they are dried and prepared according to known methods.

To Soften Putty.—Slack three pounds of stone quicklime in water, then add one pound of pearlash, and make the whole about the consistence of paint. Apply it to both sides of the glass and let it remain for twelve hours, when the putty will be so softened that the glass may be easily taken out of the frame.

Good Health.

How not to Take Cold.

Dr. Beverly Robinson, discoursing upon the subject of "colds and their consequences," gives the following useful advice: If you start to walk home from a down-town office, be said, and carry your coat on your arm because the walking makes you feel warm, you are liable to take cold. Therefore don't do it. If you should take the same walk after eating a hearty dinner, your full stomach would be a protection to you, but even then my advice would be, don't take the risk. A person properly clothed may walk in a strong wind for a long time without taking cold, but if he sits in a room where there is a slight draft, he may take a severe cold in a very few minutes. Therefore don't sit in a room where there is a draft.

Unless you are affected by peculiar nervous conditions, you should take a cold sponge bath in the morning, and not wash yourself in warm water. Plunge baths in cold water are not recommended, neither is it necessary to apply the sponge bath all over the body. Occasional Turkish baths are good, but those who have not taken them should be advised by a physician before trying them. Warm mufflers worn about the neck do not protect you against taking cold, but on the contrary render you extremely liable to take cold as soon as you take them off. They make the throat tender.

Ladies ought to wear warmer flannel underclothing than they now do, if one may judge from the articles one sees hanging in the show-windows of the shops. People take cold from inhaling cold air through their mouth oftener, perhaps, than by any other way. Ladies dress themselves up in heavy furs, go riding in their carriages, and when they get home, wonder where they got that cold. It was by talking in the cold open air, and thus exposing the mucous membranes of the throat. The best protection under such circumstances is to keep the mouth shut. If people must keep their mouths open in a chilly atmosphere, they ought to wear a filter.

Above all, be careful of your feet in cold damp weather. Have thick soles on your shoes, and if caught out in a rain which lasts so long as to wet through your shoes despite the thick soles, put on dry stockings as soon as you get home. But in cold, wet, slushy weather don't be caught out without overshoes. Rubbers are unhealthy, unless care is taken to remove them as soon as you get under shelter. They arrest all evaporation through the pores of the leather. Cork soles are a good invention.

When you go into the house or your office, after being out in the cold, don't go at once and stick yourself by the register, but take off your coat, walk up and down the room a little, and get warm gradually. Warming yourself up over a register just before going out in the cold is one of the worst things you can do. Never take a hot toddy to warm you up unless you are at home and don't expect to go out of the house again till the following morning. In short, make some use of your common sense, and thus emulate the lower animals.

How the Body is Built Up.—The muscle and fat of the body, remarks the *Journal of Chemistry*, are derived from the food, and animal heat is evolved from their combustion or their combination with the oxygen admitted by the lungs. When the muscles are inactive, slow combustion goes on; and for every grain of carbon burned, a perfectly definite amount of heat is produced. When the muscles contract, the combustion is quickened, and the additional heat is liberated in the muscles themselves. If external work be done, as in lifting a weight or hammering a nail, the heat is no longer developed in the body, but transferred to the weight lifted or the raised hammer, and is liberated when they fall, and the heat thus liberated is exactly equal to the combustion inside the body. Thus the body is an apparatus efficient beyond all others in transforming and distributing the energy with which it is supplied, but possesses no creative power. A man weighing 150 pounds, by the consumption of a single grain of carbon can lift his body to a hight of eight feet, and by the consumption of two ounces, four drachms, twenty grains, to a hight of 10,000 feet. Mayer maintains against Liebig and others, that the muscles in the main play the part of machinery, converting fat into the motive power of the organism. He saw that neither nerves nor brain possessed the energy necessary to animal motion, and believed they held fast or let loose muscular energy as an engineer, by the motion of his finger in opening or closing a valve, liberates and controls the mechanical energy of a steam engine. These views are now quite generally accepted by scientific men.

Brown-Sequard's Theories of the Nervous System.—With reference to the localization of the nervous system, the *Medical and Surgical Reporter* states that Dr. Brown-Sequard continues to announce that his experiments and researches prove that the doctrines of cerebral localization are erroneous and based on false assumptions. His demonstrations are striking. Thus, in an animal in which the right motor half of the pons varolii was incompletely divided, the left half of the bulb was afterward cut through, there remained no other way of communication between the two halves of the encephalon than by a small portion of the anterior longitudinal mass of fibers on the right side of the protuberance. Now, in this case, the galvanization of the motor centers at the right and at the left caused exactly the same movements in the limbs of the side opposite to the centers. The experiment was repeated a number of times, always giving the same results. It is observed by M. Grasset that the whole doctrine of Prof. Brown-Sequard is governed by two entirely new principles, viz.: 1st. All the phenomena which one ascertains after limited experimental or clinical lesions of a part of the cerebrum are produced by action at a distance. 2d. There are no agglomerated and circumscribed centers in the cerebrum for any function. There are certainly special cells, distinct elements, but these cells are distributed through the whole mass of the cerebrum. In other terms, there are no circumscribed, but diffuse centers.

A Hygienic Liqueur.—A friend of mine who has just returned from Germany invited me to a dinner party last week, and, at the close of the dinner—which was a singularly good one—an unknown liqueur was handed round, which was particularly recommended by the host and which no one could name. It turned out to be a new "German notion" of applied science to gormandize. The liqueur was a "pepsin essenz," invented by Prof. Oscar Luhruck, of Berlin, capable of digesting cast iron, and which the epicureans of the German empire propose to insure that good digestion shall wait upon appetite. On this occasion it did so, but whether the cook or the professor must bear the palm I cannot decide. I have seen an alderman include dinner pills among his dessert, and over this the "pepsin essenz," which has the flavor of a delicate hock, has some obvious advantages.—*London Truth.*

Sanitas.—Russian turpentine and water are placed in huge earthenware jars, surrounded by hot water. Air is driven through the mixture in the jars continually for 300 hours, the result being a decomposition of the turpentine and the formation of the watery solution of the substance, to which Dr. Kingsett, the discoverer, has given the name of "Sanitas." After evaporation, the substance, as sold in tin cans, is a light brown powder, of a very pleasant taste and odor, and capable in a very remarkable degree of preventing or arresting putrefactive changes. This new disinfectant has been in use for some time in England, and is highly spoken of. It is said to have a pleasant odor, is not poisonous, and does not injure clothing, furniture, etc. For household uses it would seem well adapted.

Preserving the Eye.—Surgery can justly boast of a new conquest. When an eye is severely wounded the healthy one is in danger of being impaired by "sympathy." To preserve the good eye it was hitherto the practice to remove the injured one. Dr. Boucheron has discovered that by cutting the ciliary nerves the "sympathy" is stopped, and thus dispenses with the necessity of removing the injured organ. Forty surgeons have thus operated successfully.

MINING AND SCIENTIFIC PRESS.

W. B. EWER.....SENIOR EDITOR.

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SAN FRANCISCO:
Saturday Morning, Dec. 6, 1879.

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The Week.

The recent storms, while they give assurance of an ample water supply for mining purposes, at the same time admonish miners that the winter season is upon us, and outdoor work, where weather exposure is required, must be brought to a close. The results of hydraulic and quartz mining for the past season has been satisfactory, and great preparations are being made for renewed activity as soon as the weather will permit. Prospecting in the various mining counties of this State continues to a certain degree, and good paying mines are being put upon the market. A common complaint made by capitalists is that application for many mining claims are not made out at Washington. Miners should see that their applications are sent in as soon as possible, for just now capital is seeking investment in mines; but the mines must be in proper shape to secure an investment. A capitalist will not invest in a mine merely because *you* tell him it is a good one. You must apply for a claim on it, and show your faith by your works. The control of the Yellow Jacket and Hale & Norcross mines have passed, by purchase, from the bonanza firm, the former to R. M. Graves and William S. Lyle, and the latter to Alvinza Hayward.

The accident at the Union shaft, Virginia city, last Tuesday, is a warning to those who hold human lives in their hands to exercise extraordinary care. The injured miners have our earnest sympathy. A government mine inspector might possibly ameliorate the condition of the miner as to liability to fatal accidents through carelessness.

Congress is in session, but has not yet formed committees. The Nicaragua canal has received a send off, in the shape of a resolution, and Congressman Belford has introduced his mining law amendment, before alluded to in this paper. It is possible that the present session may examine into the debris question. It is certain at all events, that some move will be made in this all-important matter.

Trade-mark Law.

The recent decision of the Supreme Court of the United States adjudging the law regulating the registration of trade-marks to be unconstitutional, has naturally created a deep concern in the minds of those who are the proprietors of valuable trade-marks, and a doubt as to whether their property of this class has any future value or not. Much has been published since the decision which has a tendency to create false impressions, and these we desire to correct.

The Act of Congress.

Which has just been decided unconstitutional did not profess to create or destroy any lawful trade-mark. The right to such mark is a common law right, and has always been enforced. The object of the statute was only to allow of the registration of trade-marks at a central point, as a matter of convenience and proof. For this registration the party registering paid a fee, and obtained a certificate. With this certificate, he could sue in the Federal courts, while under the common law he would have to sue in the State courts.

The great benefit arising from registration then, was that jurisdiction was given to the Federal courts, and proof was made inexpensive. Registration was granted for 30 years. At the end of that time it could be renewed, or the owner could cease to be a registrant.

The Common Law Right

Would not cease, however, but would be made only the more certain by the thirty years registration. The more perfect means for the protection and enforcement of the right, which was provided by this registration, with its annexed penalties for infringement, are, of course, lost by the overthrow of the statute, and the owner is remitted to his common law right. This right is generally recognized, and some of the States have laws upon the subject, among them California.

The Law of California

Provides for the registration of trade-marks in the office of the Secretary of State, with penalties for the infringement of such marks, so that, with a certificate, the registrant is in position to protect his rights.

We give below a letter received by us from a law firm in this city, who have made the law of patents and trade-marks a specialty for many years, and whose opinion carries weight with it.

Present Status of Trade-marks.

SAN FRANCISCO, Dec. 3d, 1879.

MESSRS. DEWEY & CO.:—You have requested a communication from us concerning the effect upon trade-mark rights of the recent decision of the United States Supreme Court, declaring unconstitutional and void the United States law which provided for the registration of trade-marks in the Patent Office, and protection of trade-marks so registered.

In reply, we have to say that the practical effect of the decision mentioned is of but little consequence. It merely leaves rights in trade-marks and protection for them just as they were before the said United States law was passed. Trade-marks are property now, and will be legally protected to the same extent and in the same manner as though the United States law had been declared valid. About the only difference will be that in most cases suits for the protection of trade-marks will be brought in the State courts instead of the United States courts, and in such actions evidence that the trade-mark was registered in the Patent Office will not be received. No trade-marks are destroyed or lost or impaired by the said decision. The United States law did not make or create or strengthen any trade-marks. It merely undertook to extend a protection to them under United States laws. That same protection, however, had been for ages extended to trade-marks by the laws of the different States in this country and by the laws of the various nations in Great Britain and Europe.

California has a trade-mark law which provides for registering the trade-mark in the Secretary of State office. It is not, however, necessary to register a trade-mark anywhere. A trade-mark becomes such by being used in trade, and when thus created, future infringements of it are prevented by injunctions granted by State courts, and damages for past infringements of it are obtained in the same tribunals, regardless of the fact as to whether or not such trade-mark was ever registered in any State or United States office.

We know of no reason why the California trade-mark law cannot be used with all the advantages with which the United States trade-mark law could have been used. It makes an official record of the trade-mark in a public office, and makes an authenticated copy of such record competent evidence by which the trade-mark can be proved in a court of justice. It also provides remedies for the protection of the trade-mark thus registered and punishments for its infringements. It practically does all that the United States law was intended to do.

WHEATON & SCRIVNER.

In this connection it is proper to add that we have just received advices from Washington, informing us that Congress will, undoubtedly, make an appropriation for the return of the fees which have been paid for registration, under the now defunct law. As soon as this is done, we shall inform our readers and shall also advise them as to the formalities necessary for its return.

Copper Mining in California.

Increased attention is being bestowed upon the copper mining interest in this State. New properties of this character are being brought into marked notice, and this valuable branch of mining interest now bids fair to assume its rightful position. Some of the mines that have long been worked are turning out increased quantities of ore, and an activity, that we hope may be long continued, is apparent in this direction.

California possesses the facilities, if they were fully in operation, of supplying the entire Pacific slope with all the copper it consumes in metal, or in the chemical salts of which it forms the base. It has the ores in sufficient quantity to yield all the copper that is used in sheet, ingot, wire, rivets or precipitate copper. In fact, if the copper properties were developed to their utmost capacity, no foreign copper would be required in the United States, for the supply could be amply met from this State alone.

Some few years ago quite a furore existed here in regard to copper mines, which led to much wild speculation and extravagant expenditure before the productiveness of the mines was ascertained. But, as in all such seasons of excitement, reason appeared to be cast aside and folly assumed its place. Such an unnatural condition could not long be sustained, and the explosion of the bubble soon ensued, being somewhat hastened by the decline in the price of copper which followed the termination of the war. Since then, with a few marked exceptions, the copper mines have been unnoticed. Many valuable veins of copper have been left unworked, and the greater portion of the field has been allowed to suffer from incrtia.

The few companies that persevered in the exploration of their mines have been rewarded with success, and are now turning out monthly paying quantities of the metal. Their success has stimulated others to follow their example, and from this cause has arisen the attention which is given to this class of mines. It has been proved that if strict economy and business-like supervision are brought to bear upon copper mining in this State, that the profits are as sure as in any other mining operations that are paying dividends to their owners.

The ores are chiefly the sulphurets. Some of them will reach the average of 18% to 22% of copper throughout the vein. Others will run from these figures down to 5% to 8%. When intermixed with carbonates or with oxides they will more than double the above percentages.

When the methods of working the ores shall have been brought to the same degree of perfection that obtains in older copper mining districts, the profits on copper mining will be very materially enhanced. In such case the by-products will all be saved, and that saving alone will pay the working expenses incurred in the reduction of the ores to metal. A great waste is allowed to exist in too many cases, which if checked would swell the profits. It takes time and experience, however, to overcome these errors.

At present the ores are piled in large heaps upon a layer of wood, which is set on fire, and the sulphur contained in the ore supports the combustion, until the ore is desulphurized. The ore is then subjected to the leaching process, and the copper is precipitated from the solution by the use of scrap iron. In some cases it is partly smelted at the mine after undergoing the roasting process, and in this concentrated condition is shipped to the refining works. In other cases the richer portions of the roasted ore are carefully culled out and shipped in sacks.

If much of the capital that is now devoted to stock speculation was judiciously invested in the development of the copper mines of this State, it would not only enrich the investors but would add to the general prosperity, beside affording occupation for an army of workers.

With a large number of mines in operation, reduction works would be established in the mining centers, and rolling mills would be put into operation. These would supply the copper wire and rivets, which are manufactured elsewhere, as well as the ingots, sheet copper and yellow-metal.

In a subsequent number of the PRESS, statistics will be presented showing the quantity of copper consumed on this coast, as well as giving the cost of reduction works and rolling mills, and showing the profits that would be derived from them. As a further encouragement to this branch of mining, arrangements will soon be consummated by which the producers of copper can obtain through the PRESS a weekly report of the ruling prices of copper in its different forms at the great copper marts of the world. With this information before him the copper miner can predicate closely as to the price he can obtain for his ores or the metal.

QUICKSILVER EXPORTS.—The exports of quicksilver from San Francisco during the month of November, by way of the sea, were as follows:

	Flasks.	Value.
China.....	800	$25,320
Mexico.....	713	22,253
Chile.....	50	1,495
New Zealand.....	25	804
British Columbia.....	1	34
Totals.....	1,594	$49,906
Previously this year.....	9,325	263,149
January 1st to Dec. 1st, 1873.....	10,919	$313,055
Same time in 1879.....	25,947	857,360

Electricity as a Motive Power.

The great question which occupies the mechanical world at the present time is the suppression of distances. Steam and electricity have already produced such surprising results that human activity, aided by the incessant progress of science, continues to aim at still greater results. In addition to the telegraphic system, which transmits thought to limitless distances; in addition to steam, which has afforded us so many powerful manifestations; and in addition to the telephone, which annihilates distance and brings human speech from widely separated quarters of the globe into close contact—we stand now in the presence of a new problem, the solution of which is faintly presented to our view through the misty clouds which envelop the future. This problem is the distant transmission of power by means of electricity. It is many years since the question was first presented to the world, and that it is capable of solution is easily understood. The immense quantity of wasted forces are sought to be utilized—concentrated at some central locality, in the midst of a flourishing population, there to be brought into subjection, and augment to vast proportions the public wealth.

With a view to solve this problem, savants have long been occupied with numerous experiments to convert electricity into mechanical power; but the feeble results of electro-magnetic machines have been from the commencement an obstacle, before which science has been compelled to halt, and the logical conclusion has been drawn, from a multitude of experiences, that it is as difficult to convert electricity into mechanical power as to manufacture diamonds from carbon. But latterly great strides have been made in the direction of success, as appears from the experiments at Sermaize, in France, where plowing by means of electricity has suppressed distance and reduced the transmission of power to a practical issue. We have here the most curious as well as the most interesting demonstration of the great principle of the correlation of physical forces.

From a mechanical point of view this question of the electric transmission of power is not clear cut. It still remains in experiment, but will, in a short time, become a certainty. We can, even now, form a very correct estimate of the results which have been obtained. A distinguished engineer, M. E. Hospitalier, in giving a resume of all of the experiments with electricity transformed into a mechanical power, says (we translate from *La Correspondence Scientifique*): When a dynamo-electric machine is put in motion by a motive force of a given power it produces an electric current. This current, conveyed to a second and similar machine, is transformed again into a working or motive power, which can be utilized to the extent of 50% of the initial force required to put the first machine in motion. Numerous experiments upon the Gramme and the Siemens' machines leave this figure indisputable. Suppose, however, that the current is transformed into 20% only of the initial force, and we would produce immense results. Imagine a steam engine of 400-horse power located in a manufacturing center of Paris, and putting in motion a certain number of Gramme or Siemens' machines, thus producing enormous quantities of electricity, which could be transmitted in every direction by means of wires to a greater distance than one mile, we would have 100 effective horse power, with this great advantage, that the simple placing or displacing of a small wire would regulate the demand for power without special installments. Every horse power could be subdivided into a greater or less number of parts without diminishing the result, and as easily as can be effected with the electric light. We could, for instance, put in motion 10 sewing machines, 5 lathes, 3 card cutters and 2 saws in 20 different places with the current produced by one single machine, producing a one-horse power, and all the work performed by these 20 different industries, costing but 10 pounds of coal per hour. Would not the expense of rent, engineer, care, etc., be greater in comparison? These electric motors are not ponderous. One invented by Marcel Deprez, which will do the work of one man, weighs less than 37 pounds, while the motor for a sewing machine does not exceed eight ounces. These motors, it will be understood, are the mechanical means of transforming electricity into mechanical power. They produce neither steam or smoke, and cannot explode. They are easily transported, and are always ready, by simply attaching a wire, to perform faithful and constant labor. We can readily perceive that great advantages would result to industries requiring small powers from a distribution of electricity, which would give motive power under such favorable conditions. It only remains to determine the value of mechanical results. That this will be done, is a question of only a few months, in spite of the prediction of W. E. Ayrton, in his lecture before the scientific meeting at Sheffield, that the realization of this power would not be effected before the next century. We have only to point to the practical results at Sermaize in France.

BAKER PASHA has gone to Asia Minor, to superintend the introduction of the proposed reforms there.

The Asbestine System of Sub-Irrigation.

This plan of sub-irrigation attracted much attention at the fairs during September and October last, it has already been introduced to practical working in Los Angeles, it is being discussed outside of the State as a possible means of securing considerable benefits—hence, we give upon this page engravings showing some of the leading points of the system, that it may be more intelligible to our readers who have not yet seen it.

The asbestine system is a California invention, letters-patent for it having been issued to the inventor, E. M. Hamilton, of Los Angeles.

It may be premised for the benefit of any who may have overlooked former mention of the system, that it consists in laying continuous cement pipe in trenches, through which the water runs by force of gravity from a reservoir above and is permitted to emerge here and there and saturate the earth beneath the surface, and thus irrigate adjacent trees and plants. The way in which this is done, may be learned by reference to the engravings, which are explained as follows:

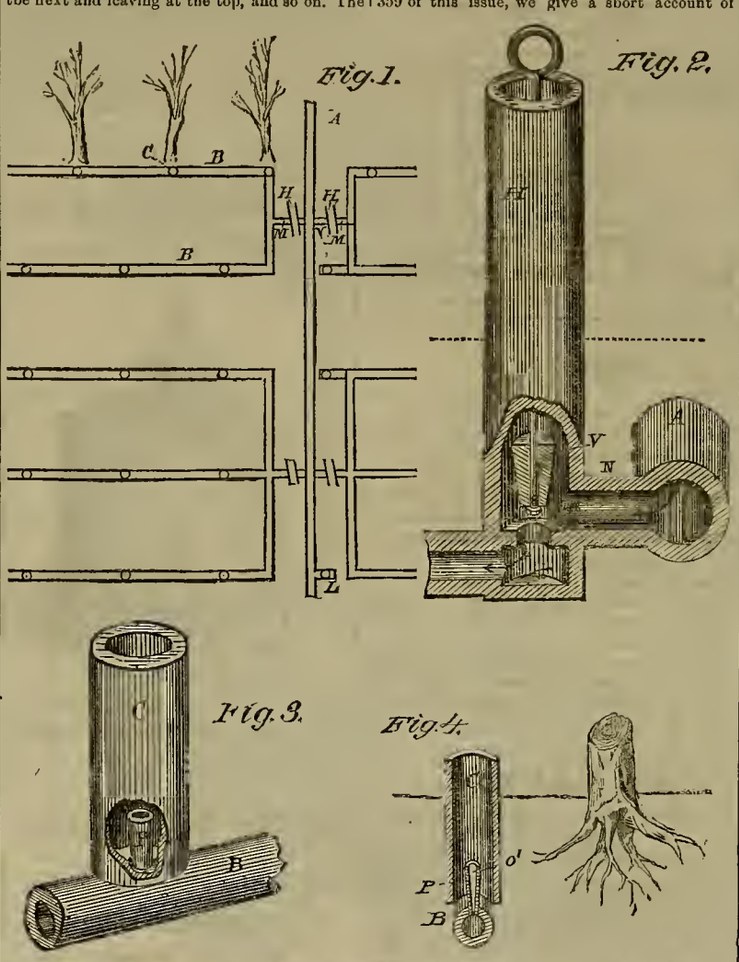
In Fig. 1, *A* is the main pipe, supplying water from reservoir. *B*—Distributing pipes, laid about a foot below the surface of the ground, and about a foot from each row of trees; or, these pipes may be laid midway between the rows. *C*—Earth-guard, a piece of pipe, as shown in Figs. 3 and 4. *H*—Hydrant, or gate, as shown in Fig. 2. *L*—Spur from main. *M*, *N*—Connections between *A* and *B* through *H*, as in Fig. 2.

Fig. 2 shows the position of the hydrant as set. The plug-valve, *V*, being closed, water rises in *H* to level of water in reservoir; upon raising *V*, water takes direction of arrows, passing into *B*.

Fig. 3 shows the position of distributing pipe, *B*; earth-guard, *C*, four-inch caliber, set loosely on *B*, extending six inches above surface of ground to prevent earth from falling on plug; and plug, *P*. Water passes along *B*, flows up through the hole (*O*, Fig. 4) in *P*, and falls down on *B*, outside of *P* and inside of *C*, and is taken into the soil by capillary attraction.

Fig. 4 shows the relative position of *B*, *C*, *P*, and the tree; the dotted line representing surface of ground. The plug, *P*, is a tapering piece of wood, stone or metal, set in the pipe, *B*, having through it a tapering hole for passage of water. The reason of making it so is, that anything which can get into the hole with the water can readily pass through, and will not, by accumulation, close it.

The above, together with the engravings, will give a clear idea of the operation of the system when in place. One of the most interesting features of this system is the making of the pipe, and this is not shown in the engravings. This is done by means of an ingenious machine which works in the trench, and thus makes and lays the pipe all at one operation. This machine consists of a cylinder or case, which is laid horizontally in the trench prepared for the pipe. This cylinder is provided with a piston or plunger which is operated by hand, and which forms the pipe from the mortar or cement which is fed to the cylinder from a feed tube or hopper on top. A flexible core is attached to the end of the piston which forms the orifice through the center of the pipe; the pipe being thus made in a continuous piece without joints of any kind, so that all leakage is avoided. The operation of the lever attached to the piston, while it forms the pipe, serves also to force the cylinder or case along the trench gradually as the pipe is made and laid, by the same operation. In working the machine a man stands in the trench, at the end of the machine on which the lever is placed, and as he works the lever he moves along backwards in the trench. The cement placed in the hopper above, passes down readily through the tapering feed tube into the cylinder behind the piston. A stroke of the piston forces the cement back in the case and around the cone to which is attached the flexible core, thus forming the pipe and at the same time driving the machine ahead correspondingly, or about two inches at each stroke.



ARRANGEMENT OF PIPES IN ASBESTINE SUB-IRRIGATION SYSTEM.

Curiosities of Earth.—At the city of Medina, in Italy, and about four miles around it, wherever the earth is dug, when the workmen arrive at a distance of 63 feet they come to a bed of chalk, which they bore with an auger, five feet deep. They then withdraw from the pit before the auger is removed, and upon its extraction the water bursts up through the aperture with great violence, and quickly fills the newly made well, which continues full, and is affected neither by rains nor drouth. But what is the most remarkable in this operation is the layer of earth as we descend. At the depth of 14 feet are found the ruins of an ancient city—paved streets, houses, floors, and different pieces of mason work. Under this is found a soft, oozy earth, made up of vegetables; and at 26 feet, large trees, with the walnut sticking to the stem, and the leaves and branches in a perfect state of preservation. At 28 feet deep a soft chalk is found, mixed with a vast quantity of shells, and the bed is 11 feet thick. Under this vegetables are found again.

Mr. Henry H. Mason died in Carson City, Nevada, November 22d. Since 1860, when we first knew Mr. Mason in Sierra county, he has been in feeble health, and as an invalid has been faithfully cared for by a diligent wife. One act of his life will never be forgotten by the writer. When our entire printing office was buried, with the town of La Porte, in 1861, Mr. and Mrs. Mason tendered us the use of all their hard-earned accumulations to continue the publication of the *Mountain Messenger*. Honest and industrious, their purse was not as large as their hearts, but their hands were swift indeed to help their humble friends in time of need. That kindly act has ever since strengthened our faith in human friendship.

Amalgamating and Washing Ores.

We illustrated and described, some little time since, the Forster-Firmin amalgamator, but since that time several improvements have been added to the machine by the inventors. These improvements have specially the following objects in view: First, the introduction into the amalgamating chamber of two or more mingled streams of ore and mercury, said streams entering at different points in such a manner that they will impinge on each other, thereby effecting a more thorough mingling of the particles of ore and mercury than is effected when only a single stream is employed. Second, the provision of a series of settlers, so constructed that the passage of the ore through them may be continuous, the operation of these settlers effecting, however, the collection of the mercury or amalgam, permitting the same to be drawn off separately from the tailings.

By means of the peculiar construction and arrangement of the series of settlers, the mass of ore, water, etc., is conducted from one vessel to another, entering at or near the top of one, and discharging close to or at the bottom of such vessel, entering near or at the bottom of the next and leaving at the top, and so on. The effect of this is to produce a very thorough admixture of the mass, so as to bring any mercury or metal which may possibly have remained therein into intimate contact.

A still further effect is that such of the ore and amalgam as has become so finely divided as to float in globules on the surface of the water, will, to a considerable extent, be caused to collect, so that it may be scraped off, or will settle on the bottom of the settlers, where it may be drawn off through the ports.

New Map of the Comstock.—A new map, showing a longitudinal section of the Comstock lode, with the distribution of the ore bodies and underground workings of the principal mines, has been published by the San Francisco News Co., No. 415 Washington street. The map is colored and drawn so as to show quartz with low grade ore, depths of shafts, depths at which Sutro tunnel will drain, bonanzas or high grade ore bodies, vertical shafts and drifts, etc. The map is an excellent one for reference.

Dry Washer.—We hear from a correspondent that Waugaman's new gold dry washing machine is now being manufactured at Los Angeles, and that Judge Peel, of Los Angeles, is working one of the machines 40 miles west of Fort Yuma. Samuel Eccles, of Silver City, New Mexico, has ordered one to work on the rich placers of that Territory.

Expanding Drill for Blast Holes.

John Julien, of Dubuque, Iowa, has devised a drilling machine for enlarging the lower or inner ends of holes for blasting purposes, so as to admit a large charge of powder being placed at one point. He uses a tube, having its upper end provided with screw threads, on which is screwed a jaw nut, and upon the end of the tube is screwed a cap, having radial arms. Through the center of the cap is passed a rod, having a thumb nut screwed on its upper end. This rod extends down to the bottom of the hole, and its lower end is forked and has a curved bit or cutter pivoted thereon. This curved bit or cutter projects through a hole in the side of the tube at the lower end, and within the tube is a slotted guide-piece which prevents the cutter being drawn up with the tube. After the usual hole has been drilled, this instrument is inserted in such hole to any desired depth and then rotated. The cutter is then, by screwing down the thumb nut, gradually fed outward through the slot, so as to make an enlarged chamber at the bottom of the hole for the purpose of applying an increased charge of powder.

Sacramento Drainage Canal.—On page 359 of this issue, we give a short account of the proposed canal intended to prevent overflow of the lands adjacent to the river, by draining the surplus waters of the Sacramento river and the waters flowing from the east side of the Coast range of mountains in the counties of Yolo and Solano into Suisun bay. It was hoped that the Chief Engineer, Isaac W. Smith, would be able to report favorably upon the feasibility of the project, but Mr. Smith, Chief Engineer, and his assistant, Jim C. Pierson, have both reported against the plan, and show the impracticability of an auxiliary canal, and of a canal to carry off the surplus waters of the Sacramento. They destroy any idea of the possibility of making a serviceable drainage canal to relieve the tule lands west of the Sacramento river, or of a short canal through Montezuma hills to tap the tule basin and relieve the river islands during flood seasons. Gray's Bend and the Sacramento being of the same level forbid the construction of the auxiliary canal, while the high level canal could not operate as a drainage canal for the tule lands. It would only carry off the flood waters of Cache and Putah creeks, and the surplus of the Sacramento river. Whichever canal should be constructed, would fail to accomplish the intended purpose, and besides would cost from $3,000,000 to $6,000,000. The report is exhaustive so far as the subject of which it treats is concerned; but it does not attempt any opinion as to a possible remedy.

The national debt was decreased $799,823 during November.

Academy of Sciences.

The regular semi-monthly meeting of the California Academy of Sciences, was held on Monday evening, Vice President J. P. Moore in the chair.

Among the donations to the museum, were a number of specimens of the mineral wax, found in Utah, and called ozocerite. It was made up in various forms, some representing fishes, etc. A number of candles formed from the substance were presented and burned readily. Dr. H. W. Harkness, the donor, said the wax was found in considerable quantities in Utah. So far, the largest masses have been found in the Rose mine, about sixty miles from Salt Lake City. The wax is black, quite soft, and easily melted. It can be bleached, and it is hoped to make it a valuable article of commerce. Ozocerite wax possesses many of the qualities of paraffine.

Capt. R. W. Simpson presented specimens of knots or excrescences resembling tubers, from the roots of Port Orford cedar trees. These "tubers" may be turned into balls and other shapes, and have a peculiarly handsome grain. The larger ones are found, however, to be worthless, being pithy inside. They are forms of abnormal growth, appearing in the ground at the roots of trees which have been injured by fire, or which grow in gravelly or inferior soil. Sometimes only two or three will be found at one tree, and again, hundreds will be found. Dr. Kellogg stated that they were akin to the bulbs or excrescences coming from the roots of cypress tress, but in the case of the cypress they appear above, instead of below ground.

Mr. Archibald Cooper presented a fossil fish from the Rocky mountains.

A number of specimens of spiders were received from a gentleman in Petaluma. They build their nests in holes in the ground. Mr. Moore described a "nocturnal spider," the habits of which he had studied. It has a hole in the ground and only appears at night, seeming to catch its prey by surprising it.

Charles Walcott Brooks called attention to the fact that there would be a total eclipse of the sun, January 11th. The eclipse will be invisible east of a line drawn through St. Joseph, Mo., and Baton Rouge, La. Visible to the western quarter of North America, the Pacific ocean, and extreme northern edge of Australia—being central and total along a line distant twenty miles south of and parallel to a line drawn through Monterey, Cal., Mariposa and Salt Lake City. Elsewhere it will be partial. The eclipse will begin as follows: Denver, Col., 4h. 1m. P. M.; Santa Fe, New Mexico, 4h. 1m. P. M.; Salt Lake City, Utah, 3h. 24m. P. M.; Victoria, V. O. I., 2h. 25m. P. M.; Portland, Or., 2h. 29m. P. M.; San Francisco, 2h. 35m. P. M.; Monterey, Cal., 2h. 38m. P. M.; Sacramento City, 2h. 39m. P. M.; Stockton, 2h. 40 m. P. M.; Mariposa, 2h. 47m. P. M.; San Diego, 3h. 5m. P. M.; Virginia City, Nev., 2h. 48m. P. M.; the sun setting more or less eclipsed. At Victoria, Australia, the sun will rise on the morning of January 12th slightly eclipsed, the eclipse continuing for 15 minutes. Next year there will be six eclipses of the sun and two of the moon.

New Zealand Gold Fields.

Advices from the mines, per *Thames Advertiser* of November 8th, give encouraging news. The monthly crushing of "Alburnia" ore gave a better return than was anticipated, 307¾ ounces of gold being obtained from 250 tons of quartz. The mine throughout is looking very well. At Dixon's low level the reef is about two and one-half feet wide, and colors of gold are frequently seen. 70 foot level, west: The manager is still driving on this reef, which keeps a good appearance, with fine looking minerals as work goes on. For the last 30 feet colors of gold were always seen when stone was broken down, and the manager's opinion is, that if the minerals continue, they will bring him on to richer gold than is being got at present. Stopes: Stoping has been commenced after this drive, and the manager hopes that something good will be met with before many feet are driven. 70 foot level, east: A winze has been sunk on this level, and is now down 16 feet. The reef is small, but shows colors of gold. Driving has been carried on at this level. The reef is not so wide as it was last month, but it is of better quality. It is now three feet wide.

Waiotahi: At the No. 3 level on the No. 4 reef, stopes 100 feet long have been opened up, the lode averaging six inches, and having a good appearance; more so as it ascends. 70 feet eastward have been driven on the No. 5 lode at this level. For the purpose of ventilating the low level workings, a crosscut has been driven from the No. 4, and in it a good bearing leader was met with. The drive on the No. 5 is about to be timbered up prior to commencement of stoping operations. Above the No. 2 level stoping is going on on a number of leaders, and a large quantity of crushing dirt is being obtained. A new reef, which is likely to turn out payable stuff, has been intersected on the hanging-wall of No. 5 above this level. It has been driven on for 30 feet, and is about eight wide.

Testing and Working Silver Ores.

The above is the title of an illustrated work of 114 pages, for miners and prospectors, by Chas. H. Aaron, which has been issued by Dewey & Co. Mr. Aaron has managed to give many useful hints and suggestions free from all technicalities, and in such a style as to be easily comprehended. It is written for the miner, with no chemical symbols or metallurgical technicalities to confuse those who are not chemists or metallurgists. The following summary of the contents of the work will give an idea of its scope:

Under the heading of the first chapter, "Testing Ores for Silver," we find paragraphs on ore formation test for silver, with heat and water, acid or blow pipe. In speaking of testing for a process, the extent and richness of ore is considered, smelting ores, selecting and working sample, appliances for testing, roasting, etc. Under the head of "Working Ores" the author describes Aaron's process, has something to say of superheated steam, preparation of dichloride of copper and protochloride of copper, use of copper and iron, quantity of chemicals, carbonate of lime, chloride ores, amalgam, Patchen's process, etc. He also describes the methods of working roasted ores, treatment of base metals, stirring, heat of furnace, want of sulphur, etc. Under the head of "Leaching Processes" are the titles, Smelting, Mexican process, Chilean process, Krochnke's process, etc. Under "Pulverizing Machines" are described the arastra and its construction and operation, stamp batteries, screens, Crocker's trip-hammer battery, Paul's pulverizing barrel, Kendall's battery, Noice's pulverizer, a cheap rock breaker, etc.

In speaking of amalgamators the author describes a cheap amalgamator, grinding the ore, directions for making a barrel, preventing mechanical wear, use of quicksilver, copper in bars, Freiberg barrel, cheap barrel trough, barrel on rollers, Aaron's amalgamator, separator, etc.

He describes an improvised retort, roasting furnace, furnace tools and furnace building. Among the miscellaneous mention may be found Aaron's leaching apparatus, with two or three different arrangements, a small mill, sampling tailings and settling tanks, dichloride of copper, etc. Mr. Aaron is a practical miner, of long working experience on this coast.

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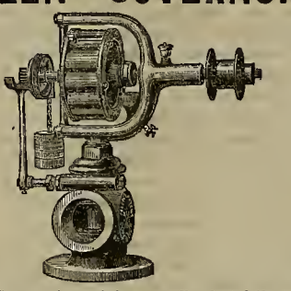

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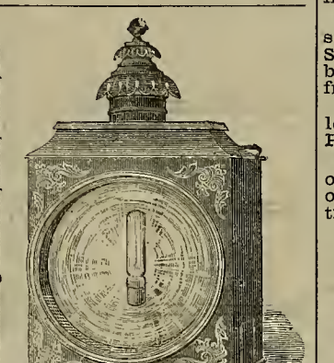

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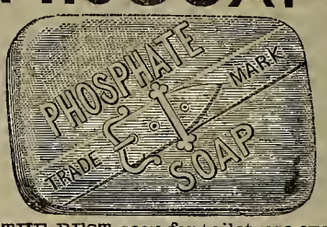

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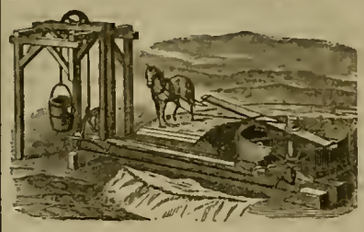

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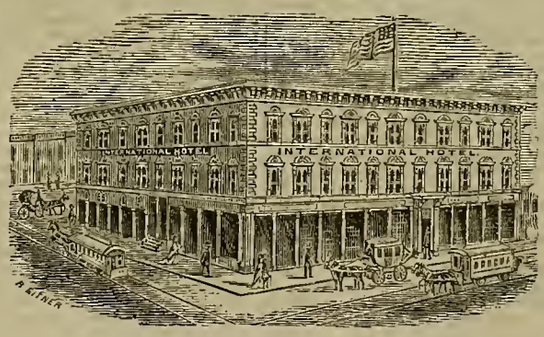

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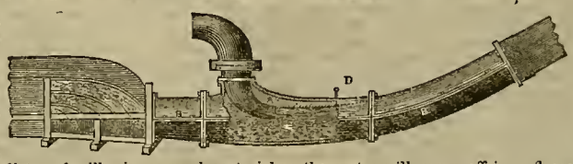

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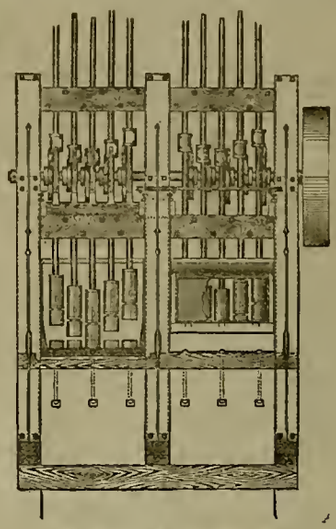

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CONTINUED FROM PAGE 357.

obtained, is situated on a line with the Shamrock, and not a quarter of a mile distant.

TOMBSTONE.—A private letter to the *Citizen* says: The developments in the Tough Nut mine are surprisingly rich; that assays show some of the ore to carry $13,000 in gold and nearly $10,000 in silver, and the quantity of the ore is beyond calculation. The mill is running very well.

ESPERANZA.—Judging from the report in the Tucson *Star*, this mine is a promising prospect. The shaft is down 100 ft, and a drift is being pushed to cut the vein. About 20 or 30 ft will have to be driven before this point is reached. There are three shafts at work. About three ft per day is accomplished. The ledge on the mine is very large. At the depth of 52 ft, where the shaft left the vein, it was nine ft wide. It is thought this width will not be diminished at the 100-ft crosscut.

COLORADO.

CUSTER COUNTY.—Silver Cliff *Prospector*, Nov. 24: The Dora smelter makes shipment to-day of 95 to 100 bars of bullion, averaging 105 pounds to the bar. A car-load was also shipped from this smelter Friday, which we did not mention. We made mention a few days ago of some fine ore taken from the Sitting Bull, and gave as a surmise that it would run from 40 to 60 ounces. Messrs. Davidson, Metzler and McAnley have since made test by assay, the specimens running above 300. We learn the following of the Little Ed, a mine near Rosita: The owners, Messrs. Gormley, Metzler & Broad, have sunk a shaft 30 ft and 3½ wide. It gives an iron lead, mixed in with spar, horn silver and some chlorides. The Little Ed is about to be bonded for $5,000. The Mountain Boy mine, situated in the range, recently opened by a party of gentlemen who have been quietly working away at their developments, now proves to be valuable property. At a depth of 25 ft the same kind of ore is found as that taken from the Silver King.

PITKIN.—San Juan *Prospector*: A writer says: The recent assays from the mines on the Ohio creek have created this rush. Gold, bright, glittering gold, as has not been recently found in Colorado, the extent of which is beyond the imagination of the most sanguine. Sample assays are as follows: The Dodson Lode, a true fissure vein of two ft, 60 ounces in gold and 40 in silver. The Golden Link, owned by the Campbell Bros., Fulton & Co., 80 ounces gold, 100 silver. The Ohio Lode, 70 ounces gold, 60 in silver. The Glidden Lode, 30 ounces gold, 20 silver. The last named is the property of Pennington & Co., and it is considered to be the biggest thing in the district, for although the assays are not so large as from the other mines, the lead shows four ft of gold-bearing rock, which, although but 17 ft has been reached, it is now widening, and its value is beyond estimate.

IDAHO.

YANKEE FORK.—The *Herald* of Nov. 22 publishes its promised "Mining Review," from which we make the following extracts: General Custer.—It is estimated that there is at least $3,000,000 in sight at Mount Custer mine, and about 1,300 tons of ore on the dump, which will average $200 per ton. Something over three months since active operations were commenced on this star property, and since that time the Pfeiffer tunnel has been advanced 120 ft. The vein was cut the first 20 ft and proved equal in richness to that heretofore uncovered in the mine. A road is being constructed from the mouth of the tunnel to the most practicable place for an ore house, which will be connected with the intended 40-stamp mill on the Yankee Fork, 2,000 ft below, by a tramway. This roadway has been inclosed with substantial mining timbers, practically welded into the hillside, designed to protect it against the storms of winter. Near the point for the ore house a commodious and substantial boarding house has been erected, which will nicely accommodate 100 men. An excellent mountain road has been made from the Valley of the Yankee Fork to the mine. So far, the vein has proved to be about 10 ft thick, of high grade milling ore.

UNKNOWN.—This mine joins the "Custer." The vein was tapped by the Hyde tunnel at the distance of 125 ft.

GENERAL MILES AND SILVER BELL.—Large croppings extend across both locations, average assays of which give $22.80 silver and $18.48 gold. A tunnel is being run to cut the veins.

HOPE.—Lies about one-fourth mile east of Yankee Fork, and one-half mile north of Mount Custer. Cut and tunnel on the vein, both in quartz. At 20 ft from surface the vein is five ft four in. between walls, two ft of which, in the cut, assays $307 silver and $180 gold. The walls are smooth and regular, and the ledge can be traced for hundreds of feet by the outcrop. Ore similar to that in the Custer. Numerous other locations on Mount Custer make a very rich showing.

CHARLES DICKENS.—This mine is situated on Norton hill, which is near the junction of Yankee Fork and Jordan creek, and about a mile and a half west of Mount Custer; $10,000 of ore has been reduced by arastra process from this mine during the past four months. The vein in the winze at the mouth of the tunnel is seven ft wide, one and a half ft of which assays $200.

DANIEL O'CONNELL.—Parallel with Charles Dickens. Tunnel in 80 ft on two-ft vein of $150 ore.

OTHER MINES.—A cluster of locations exist which contain rich ores of gold and silver, assaying from $50 to $300, the greater part being gold.

MONTANA.—This mine in the above belt is considered the king mine. A tunnel was first run in 00 ft on the vein, about midway of which a winze is being sunk, and is now down 75 ft. The quartz vein is nine and a half ft in width, averaging $300 per ton, two-thirds gold and one-third silver. The ore is very easily reduced; that worked here by arastra process yielded 85% of the assay value. There are four grades of ore in the mine. The first-class samples over $3,000 per ton; second, $1,500 to $1,700; third, $400 to $500; and fourth, $150 to $200. Over $50,000 worth of shipping ore has been taken out of the shaft, which averaged $1,500 per ton. There is from 100 to 150 tons of fourth class ore on the dump. In sinking the winze, $1,600 was panned from the loose dirt, and from $500 to $1,000 per day in gold has sometimes been pounded, in a hand mortar, out of rich specimens found in the ledge. Recently, 225 pounds of quartz crushed in a mortar produced $1,800 in gold. The vein is in porphyry, and has been found at different points on the surface for a distance of 800 ft.

SNOWBIRD AND CHARLES WAYNE.—This mine is on the summit of the mountain, and has a tunnel on the north slope. Ore is found the whole length of the vein; in places 20 ft wide, and in this is a 2-ft vein that assays $500. The Charles Wayne is 175 ft northwest of the Snowbird, and was the first ledge discovered on the mountain. There is a tunnel 60 ft on the vein, which is 100 ft below the crest of the mountain. The vein is 4 to 5 ft wide, and as the tunnel progresses the richness of the ore increases, approximating now $800. The quartz carries both gold and silver, with considerable horn silver and free gold. The middle vein in this location is 7 ft in width with a 10-inch seam of high grade ore.

PIONEER.—Joins the Snowbird, and carries same grade of ore, with the exception that on the southwest slope of the mountain the veins are composed almost exclusively of gold quartz, some very large pieces being found rich in free gold. The best of the ore can be assorted up to $3,000 per ton. There is a cut 60 ft long and 15 ft deep on the Pioneer, showing much good ore in a 2 to 2½-ft vein, widening as it comes down the mountain.

HIDDEN TREASURE.—Joins the Montana, and is opened by an incline 70 ft, and a level run from this 00 ft on the vein. The incline follows the ore body all the way down, and it continues of a very fair grade the entire length of the level. The vein is 6 ft wide, very uniform and averaging $150 across the ledge.

MONTANA.

BONANZA CHIEF.—Helena *Independent*: A writer to an exchange says: In one place the fine disintegrated rock yielded $1 to the pan, and I have never seen a full pan tested that did not carry fully 20 cents when the rock was properly powdered. I measured the opening, and found it to be 66 feet across, in what was supposed to be the direction of the lode, and transversely it was over 65 feet, and yet there are no walls. It is estimated that there are about 3,000 tons, including what is now on the dump, in sight.

JUDITH MINES.—Letter from Yago Gulch says: I understand the Benton mining company made a good clean-up last week on the rim rock. The gold was very coarse. I did not learn the amount of the clean-up. I prospected the rim on my own claim, with satisfactory results, but the rims don't amount to anything. The gulch ought to be good. If it is, it will pay for a bedrock flume, even if there is nothing on bedrock. A good many drain ditches are under headway at present.

Destruction of Government Timber.

The annual report of Secretary Schurz, handed to the President last week, contains the following passage, of special interest for Pacific Coast States, Colorado and all the Territories. After stating that the measures taken by the Interior Department for the protection of public timber have produced a good effect on public sentiment in many localities, he says: "It must be kept in mind, however, that the limited means allowed by Congress permitted a small field to be covered by these operations. The greatest danger of the wholesale destruction of our forests and of the disastrous consequences that destruction will bring after it, exists in those States and Territories where the timber indispensably required for domestic use and local industry must be taken from public lands, there being no timber lands in private possession; and the public lands being mostly unsurveyed and not subject to purchase or entry. In my last annual report I discussed the inadequacy of the laws enacted by the last Congress, authorizing citizens of Colorado, Nevada and the Territories to fell and remove timber on the public domain for mining and domestic purposes, and providing 'for the sale of timber lands in the States of California and Oregon and in Washington Territory.' The opinion I ventured to express, that the first of these acts would be taken advantage of, not only by settlers and miners to provide economically for their actual current wants, but by persons who would see in this donation a chance to make money quickly; that it would stimulate a wasteful consumption, beyond actual need, and lead to wanton destruction, and that the machinery left to this Department to prevent or repress such waste and destruction, through the enforcement of rules to be made by the Commissioner of the General Land Office, would be found insufficient for that purpose has already, in many places, been verified by experience; also, the predictions made by the Commissioner of the General Land Office with regard to the effect of the second one of the above named acts. Referring to what was said about these laws in my last annual report, I repeat my earliest recommendation, that they be repealed, and that more adequate legislation be substituted therefor. It is by no means denied that the people of the above-named States and Territories must have timber for their domestic use as well as the requirements of their local industries; neither is it insisted upon that the timber so required should be imported from a distance so that the forests in these States and Territories might remain intact. This would be unreasonable, but it is deemed necessary that a law be enacted providing that the people may lawfully acquire the timber required for their domestic use, and their local industries from public lands, under such regulations as will prevent the indiscriminate and irreparable destruction of forests, with its train of disastrous consequences. It is thought that this end will be reached by authorizing the Government to sell timber from the public lands, principally valuable for timber thereon, without conveying the fee, and to conduct such sales by Government officers under such instructions from this Department as will be calculated to prevent denudation of large tracts, especially in those mountain regions where forests once destroyed will not reproduce themselves. I have no doubt that under such a law, well considered in its provisions, the people of those States and Territories would be enabled to obtain all the timber they need for domestic as well as industrial purposes, at reasonable rates, and that at the same time the cutting of timber can be so regulated as to afford sufficient protection to the existence and reproduction of the forests, which is so indispensable to the future prosperity of those regions. I venture to express the opinion that the enactment of such a law has become a pressing necessity, and cannot much longer be delayed without great and irreparable injury to one of the most vital interests of the people."

The Secretary, referring to the enormous devastation of forests by fires left negligently burning or deliberately set for the purpose of deadening timber, recommends the enactment of some severe penalty, for willful or negligent setting of fires upon the public lands of the United States, and, also, for the recovery of all damages thereby sustained. He says it may in many cases be difficult to obtain testimony necessary for the conviction of persons guilty of this offense; but if the law is successfully enforced only in some instances, it will serve to direct general attention to the danger of incurring its penalty, and thus make many persons, who so far have given no thought to the possible consequences of their negligence or recklessness, more careful in future.

Secretary Schurz this year renews his previous recommendation for legislation to provide for the more speedy settlement of private land claims in territory acquired from Mexico, except California, which was provided means for the judicial determination of such matters many years ago.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING NOVEMBER 18TH, 1879.

221,659.—SYRUP CAN—O. J. Backus, S. F.
221,773.—ORE-REDUCING APPARATUS—W. Brunner, S.F.
221,663.—COMPOUND FOR DRAIN TILES—H. F. Bundock and E. T. Mapel, Sacramento, Cal.
221,778.—WATER ELEVATOR—R. M. Catlin, Tuscarora, Nev.
221,719—DEVICE FOR APPLYING COLOR TO EYE LASHES—R. Clinton, Portland, Ogn.
221,724.—WHIP—J. E. Curtis, Ukiah, Cal.
221,728.—FINGER RING—C. M. Halsey, S. F.
221,816.—VALVE—T. Hennessy, Oakland, Cal.
221,829.—BEER FAUCET—C. Karstens, S. F.
221,841.—PAINT AND ROOFING COMPOUND—T. B. McKinstry, Portland, Ogn.
221,738.—CAM FOR STAMP MILLS—L. A. Moore and J. Dykes, Oreana, Nev.
221,742.—MINING SLUICE—J. M. Robinson, Eureka, Cal.
221,751.—MIDDLINGS SCOURER AND PURIFIER—G. Swinnerton, S. F.
221,756.—PARLOR MANTEL GRATE.—J. L. Tressler and W. H. Loomis, Alameda, Cal.

FOR THE WEEK ENDING NOVEMBER 25TH, 1879.

211,952.—INVALID BED—J. H. Archer. S. F.
221,903.—ATMOSPHERIC PUMPING SYSTEM—W. P. Barclay, S. F.
222,004.—MANUFACTURE OF CEMENT—C. Brown, Mare Island, Cal.
222,018.—DISCHARGING AMALGAMATING PANS—E. Coleman, S. F.
222,019.—AMALGAMATING PAN—E. Coleman, S. F.
222,027.—HYDRO-CARBON PRESSURE GENERATOR—H. H. Eames, S. F.
221,960.—TRUSS—G. Gleim, Yreka, Cal.
222,033.—BOOK—E. S. Glover, Portland, Ogn.
221,961.—VACUUM ENGINE—B. Goldmann, S. F.
221,920.—SAFETY POCKET—L. Jakuboroski, S. F.
221,928-9. — OIL CUPS — J. G. McBride, (2), Sacramento, Cal.
221,970.—AIR-COMPRESSING FANS—M. B. Miller, S. F.
222,074.—STEAM PACKING—G. C. Phillips, Silver City, Nevada.
221,989.—RATCHET WRENCH—J. Woolford, Plymouth, Cal.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

IMPROVEMENT IN MIDDLINGS SCOURERS AND PURIFIERS.—George Summerton, 1422 Pacific street, S. F. Patented Nov. 18th, 1879. No. 221,751. In the ordinary machines for purifying middlings, difficulty is experienced in removing a peculiar fuzzy substance with which the middlings are intermingled. This substance seems to cling to the middlings in such a manner that it is not removed by an ordinary air blast, and can only be thoroughly removed by rubbing. It is not desirable to regrind this fuzz or light substance, and the inventor has therefore devised a means of scrubbing the substance under treatment so as to remove the fuzzy or light material from the middlings and blow it away, thus separating the valuable material from the dross. To accomplish this, a series of corrugated tables is mounted, one above another, in a cylinder or case, at the top of which is a peculiarly constructed propeller-shaped fan for inducing an air current or blast. In the center of the cylinder is a series of vertical circular diaphragms, corresponding in number to the number of tables, in the bottom of which are arranged circular rows of brushes which may be kept in contact with the tables, these brushes scouring or scrubbing the middlings on the tables so as to separate the light material which is drawn off by the air current. These diaphragms also answer the purpose of air tubes for directing the blast. Suitable arrangements are made for controlling the feed of material, for regulating the blast of air, and for adjusting the scrub of the brushes.

ATMOSPHERIC PUMPING SYSTEM.—W. P. Barclay, S. F. Patented Nov. 25th, 1879. No. 221,903. The improvements consist in providing at the surface of a mine an air-discharge cylinder or vacuum engine, connected by an air pipe with a series of atmospheric engines, situated at different levels in the mine, said engine being suitably connected with plunger force pumps. The air-discharge cylinder takes the atmospheric pressure or weight from opposite sides of the piston of the atmospheric engines alternately, so that these engines and their connected pumps will be operated at different levels by the one air-discharge cylinder, thus dispensing with all heavy pump rods. By this means, in a mine, for instance, two thousand feet in depth, instead of the pumps being worked by a massive engine on the surface, connected to the pumps by heavy pump rods extending the whole depth, with the attendant balance rod, bob, etc., the separate pumps are worked by the single air-discharge cylinder, as described.

AIR-COMPRESSING FAN.—Morgan B. Miller, S. F. Patented Nov. 25th, 1879. No. 221,970. The object of this device is to give a great pressure of air with comparatively small power. This is accomplished by making the arms or blades of the fan in a peculiar shape, like a conical ogee curve, so that they will both draw in and force out the air with great facility. The heels of these fans, being made concave and projecting out by the edge of the case into the central opening, direct or throw the air into the center of the chamber. The faces of the fans are made convex, and the air is thus directed up the fans toward the periphery of the wheel. The outer ends of the fan are made convex, while the fans remain concave, and the air is thus blown with great force through an opening into the compression box or supplemental chamber. The fan is rotated very rapidly, and the air is forced into this box so strongly that it is more or less compressed, so that the pipes leading the air from the box convey the air, in a compressed state, to the point of issue. A very strong blast is obtained in this way without any undue expenditure of power, and this class of blowers thereby very much increased in efficiency.

INVALID BED.—Jamee H. Archer, S. F. Patented Nov. 25th, 1879. No. 221,952. In the construction of this invention, a peculiarly divided hinged or jointed bed-bottom is used, having a supplemental leaf hinged to it, and, in combination with this bottom, a series of folding, adjustable standards with cords and pulleys, together with a roller, crank and ratchet, by which the bed-bottom is raised and held at any point. With this roller and the jointed bottom, curved links or hooks are employed at different points upon the bed-bottom, and also upon the roller, so that by shifting from one hook to another, one set of cords will serve to make all the adjustments which may be needed. The standard may be folded down so as to be concealed, and the bed present an ordinary appearance when desired.

VACUUM ENGINE.—B. Goldmann, San Francisco. Patented Nov. 25th, 1879. No. 221,961. This invention relates to a novel construction for a vacuum engine; and it consists in the employment of one or more cylinders having suitable ingress-valves, by which an explosive or inflammable gas or vapor may be admitted and ignited. The surface of the piston or pistons is open to the action of atmospheric pressure, and when the vacuum is formed beneath the piston it will be depressed. Suitable operating-levers and connections serve to move the different parts.

IMPROVEMENT IN TRUSSES.—Geo. Gleim, Yreka, Siskiyou Co., Cal. This device relates to an improved truss such as is used in the treatment of hernia, and consists in certain details of construction by which the pad is kept in its exact position, while, at the same time, freedom of motion is allowed to the plate to which the belt or band is attached for keeping the truss in place. Once regulated the pad is immovable and the truss self-adjusting. This construction may be applied to single, double, umbilical, and all other kinds of trusses, which may be made of any suitable material desired.

ACCIDENT AT THE UNION SHAFT. — A frightful accident happened at the Union shaft, Virginia City, last Tuesday. B. F. Corliss, engineer at the Union shaft, on changing shift this morning, ran the cage and skip into the sheaves. Eighteen men in all were on the cage and in the skip under it. The skip is itself a self-dumper, and the engine was set to running at such a speed that eight out of nine men in the skip were thrown from 12 to 20 feet over beyond the chute and upon the floor. Out of nine men on the cage, all but two jumped off. After dumping the skip, both cage and skip were raised about 40 feet, and when the sheave was struck, the new wire cable, seven inches wide and three-fourths of an inch thick, was snapped like thread, and the whole building terribly shaken. Nearly all of the men were injured and two were killed or have died of the injuries received. When the cage struck the sheave and the rope broke, the safties held it, and the men were seen hanging about the shaft and timbers like flies on branches. Male says that 600 feet from the top, the engineer commenced increasing the speed of ascent; 250 feet from the surface another increase was made, and when they came to the surface it went faster yet. The only possible explanation given is that the engineer, in place of shutting off steam, had unwittingly turned more on. The indicator to the engine had been stopped a few days before to repair it, but the rope was well tagged, and no excuse is offered for the carelessness of the engineer.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Hillside, November 29th, $3,500; Northern Belle, November 29th, $9,240.14; Christy, December 1st, $7,077.

New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's office at San Francisco:

ARIZONA CONCENTRATING CO.—Object: To carry on the business of milling and mining in Arizona Territory. Capital, $100,000. Directors—Charles M. Seeley, Edward W. Stephens, Charles E. Travers, Joseph Tyson, Walton Townsend, Edward Reilly and D. L. D. Dyke.

MOUNT DANA M. CO.—Object: To mill and mine in Tioga district, Mono county. Capital, $1,000,000. Directors—J. M. Walker, Edward W. Frey, E. M. Hall, G. W. Hopkins and John T. Bradley.

EASTERN BELLE G. & S. M. CO.—Capital, $10,000,000. Directors—J. L. Cullison, N. K. Masten, F. Locan, Wm. F. Booth and A. J. Ralston.

News in Brief.

MICHAEL CHEVALIER, the political economist, is dead.

THE miners of Cambridge valley, Ohio, are on a strike.

THE Bishop of Massai, Abyssinia, has been imprisoned by King John.

THE Indian outbreak in Colorado is again assuming unpleasant features.

GRANT does not expect to visit Washington until his return from Mexico.

A NEW reservation, in some of the Territories, is to be selected for the Utes.

SERIOUS Indian troubles are reported from Texas, many whites having been massacred.

CHIEF OURAY has been presented with a watch for his friendship to the whites.

THE poor in the southwestern portion of Ireland are suffering for want of necessaries.

THE Sidney-Australia exhibition has received only $70,000 against $1,115,000 expenses.

ALL of the newly elected officers of San Francisco took their seats on the 2d of December.

AN extradition treaty between the United States and the Netherlands will soon be adopted.

FLOOD & Co., have disposed of their interest in the Halo & Noreross and Yellow Jacket mines.

THE Cuban insurgents have met with a serious reverse in the Province of Santa Clara.

THE coal companies of Pittston, Pa., have voluntarily advanced the wages of the miners 10%.

Two representatives of the French government are in New York inspecting postal facilities.

PULSIFER, of the Boston *Herald*, is now the nominee of all parties for Mayor of Newton, Mass.

CHIEF DOUGLAS has returned the money he stole from Mrs. Meeker at the time of her capture.

THREE THOUSAND women are registered in Massachusetts for the coming municipal elections.

THREE Catholic Bishoprics are to be established in America, under the Archbishop of New York.

SPECIE received at New York from abroad from January 1st to date, aggregates $77,184,080.

PATRICK CROWLEY has been chosen by the San Francisco Police Commissioners as Chief of Police.

THE Atlantic and Great Western railroad is to be sold under foreclosure at Akron, O., January 6th.

SILVER in London 53¾d; consols, 97 5-16; 5 per cent United States bonds, 105½; 4s, 106⅞; 4½s, 109¼.

A HEAVY land slide in Niles canyon is causing considerable trouble to the Central Pacific Railroad Company.

BRITISH iron workers are cautioned in an address not to emigrate to America until assured of employment.

SIXTEEN Revenue Deputies have been captured by "Moonshiners" in Georgia, one being badly wounded.

AT Liverpool wheat is quoted at 10s 7d to 11s 6d for average California white, and 11s 6d to 11s 10d for club.

YAKOOB KAHN has departed from Cabul, which is said to mean that Afghanistan has seen the last of its Ameers.

IN San Francisco half dollars are quoted at par; trade dollars, 95 buying, 96½ selling; Mexican dollars, 96 buying, 96½ selling.

IN New York Government bonds are quoted at 102⅞ for 4s of 1907; 102½ for 5s of 1881; 105⅜ for 4½s; sterling, $4.81½@4.84; silver bars, 114⅞; silver coin, ⅛@½ discount.

THE Czar of Russia is about to establish reforms in the Government, and proposes to call a number of unofficial advisers to assist him.

CONGO MINING DISTRICT, NEVADA.—This is a new mining district, and was organized on the 20th of September, at a meeting of miners held at Paradise, Humboldt county, Nevada. The boundaries of this new district are as follows: Commencing at the termination of T. J. Bradshaw's wood road, on the summit of the mountains, adjoining Rebel Creek district; thence south along the eastern boundary of said Rebel Creek district, to the Shaw district; thence east to the southeast corner of David Abel's ranch; thence north to the northeast corner of John Byrnes' ranch; thence west to the point of commencement.

OUR AGENTS.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. L. THARP—San Francisco.
B. W. CROWELL—California.
A. C. KNOX—Pacific Coast.
S. V. BLAKESLEE.—California.
G. W. MCCREW.—Santa Clara county.
J. B. BACHELDER.—Shasta County, Cal.
JAMES ROGERS—Oregon and Washington Ter.
THOS. H. MANNING—Nevada, Idaho and Montana Ter.
CAPT. W. H. SEAMENS—Arizona.
M. P. OWEN—Santa Cruz County.
H. E. HALLETT—Los Angeles County.
T. H. ORGAN—Alameda county.
M. B. STARR—Contra Costa county.
J. D. BASNETT—State of Nevada.

THE INTERNATIONAL HOTEL, advertised in this paper, is one of the popular hotels of S. F. None other has so long held an equal reputation. Travelers wishing comfortable accommodations at very reasonable rates should try the International, and they will get fair treatment and value received for their coin.

Back Numbers Wanted.

The following volumes and single copies of the MINING AND SCIENTIFIC PRESS are wanted at this office, for which a reasonable price is offered:

Year.	Volume.	
1870	20	2 Complete volumes, 1st half (of year).
1870	20	2 Copies of No. 2, Jan. 1st.
1870	20	1 Copy each of No. 1, Jan 1st, 3 of Jan. 11th, 7 Feb. 11th, 6 Feb. 4th.
1870	21	1 Copy of No. 7, August 13th.
1871	22	5 Copies of No. 1, Jan. 7th.
1871	22	3 Copies of No. 5, Feb. 4th.
1871	22	1 Copy of No. 3, Jan. 21st, 6 of Feb. 2d, and 1 of May 1st.
1871	23	1 Copy of No. 2, July 15th, and 9 Sept. 2d.
1872	24	2 Copies of No. 4, Jan. 27th.
1872	24	3 Copies of No. 7, Feb. 17th.
1872	24	2 Copies of No. 17, April 27th.
1872	25	1 Copy of No. 19.
1872	25	1 Complete volume, last half (of year).
1873	26	3 Copies of No. 8, Feb. 22d.
1873	26	3 Copies of No. 9, March 1st.
1873	26	2 Copies of No. 10, March 8th.
1873	26	1 Copy of No. 7, Feb. 15th.
1873	27	3 Copies of No. 20, Nov. 15th.
1873	27	4 Copies of No. 21, Nov. 22d.
1873	27	3 Copies of No. 24, Dec. 13th.
1875	30	1 Copy of No. 4, Jan. 23rd.
1875	30	1 Copy of No. 5, Jan. 30th.
1875	30	1 Copy of No. 8, Feb. 20th.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Cruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

HOW TO STOP THIS PAPER.—It is not a herculean task to stop this paper. Notify the publishers by letter. If it comes beyond the time desired you can depend upon it we do not know that the subscriber wants it stopped. So be sure and send us notice by *letter*.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

EXTRA COPIES can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

Chew JACKSON'S BEST Sweet Navy Tobacco

METALS.

[WHOLESALE.
WEDNESDAY M., December 3, 1879.

IRON.—	
American Pig, soft, ton	28 00 @35 00
Scotch Pig, ton	26 00 @30 00
American White Pig, ton	25 00 @— —
Oregon Pig, ton	28 00 @35 00
Refined Bar	4 @ 3
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 8
Norway, according to thickness	7 @ 8
COPPER.—	
Sheathing, lb	34 @ 35
Sheathing, Yellow	19 @ 20
Sheathing, Old Yellow	— @—
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @ —
TIN PLATES.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb, less than cask	9½@— 10
NAILS.—	
Assorted sizes	3 50@4 50

LEATHER.

[WHOLESALE.
WEDNESDAY, M., December 3, 1879.

Sole Leather, heavy, lb	22 @ 29
Light	20 @ 24
Jodot, 8 Kil., doz	48 00 @50 34
11 to 13 Kil	45 00 @37 00
14 to 19 Kil	61 00 @73 00
Second Choice, 11 to 16 Kil	55 00 @70 00
Cornelian, 12 to 16 Kil	57 00 @67 00
Females, 12 to 13 Kil	63 00 @67 00
14 to 16 Kil	71 00 @76 00
Simon Ullmo, Females, 12 to 13 Kil	58 00 @62 50
14 to 15 Kil	66 00 @70 00
16 to 17 Kil	72 00 @74 00
Simon, 18 Kil	61 00 @63 00
20 Kil	65 00 @67 00
24 Kil	72 00 @74 00
Robert Calf, 7 and 9 Kil	35 00 @40 00
Kips, French, lb	1 00 @ 1 35
Cal. doz	40 00 @60 00
French Sheep, all colors	8 00 @15 00
Eastern Calf for Backs, lb	1 00 @ 1 25
Sheep Roans for Topping, all colors, doz	9 00 @13 00
For Linings	6 50 @10 50
al. Russet Sheep Linings	1 75 @ 4 50
oot Legs, French Calf, pair	4 00 @— —
BGood French Calf	4 00 @ 4 75
Best Jodot Calf	5 00 @ 5 25
Leather, Harness, lb	35 @ 37½
Fair Bridle, doz	48 10 @72 00
Skirting, lb	33 @ 37
Welt, doz	30 00 @50 00
Buff, ft	15 @ 17
Wax Side	15 @ 17

LUMBER.

WEDNESDAY M., December 3, 1879.

CARGO PRICES OF REDWOOD.		REDWOOD. RETAIL PRICE.	
Rough, M	12 00	Rough, M	15 00
Rustic	18 00	Pickets, Rough	15 00
do. No. 2	14 00	Pointed	16 00
Flooring	20 00	Fancy	22 50
do. No. 2	18 00	Siding	20 50
Beaded Flooring	23 00	Surfaced & Long Beaded	30 00
Refuse	13 00	Flooring	25 00
Half-inch Siding	16 00	do. No. 2	17 00
Refuse	14 00	Rustic, No. 1	25 00
Half-inch Surfaced	20 00	do. No. 2	18 00
Refuse	14 00	Battens, lineal ft	
Half-inch Battens	16 00	Shingles M	2 00
Pickets, Rough	11 00	**PUGET SOUND PINE** RETAIL PRIDE.	
Rough, Pointed	12 50	Rough, M	18 00
Fancy, Pointed	18 00	Fencing	18 00
Shingles	1 75	Laths	3 50

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]
SAN FRANCISCO, December 3, 3 P. M.

SILVER, ⅛ par.
GOLD BARS, 890@910. SILVER BARS, 10@18 ⅌ cent. dis count.
EXCHANGE on New York, 20, on London bankers, 49¾@ 49¾. Commercial, 50; Paris, five francs ⅌ dollar; Mexican dollars, 93@95.
LONDON Consols, 97 9-16; Bonds (4%), 105¾.
QUICKSILVER in S. F., by the flask, ⅌ lb, 39@40c.

GENERAL MERCHANDISE.

[WHOLESALE.
WEDNESDAY M., December 3, 1879.

CANDLES.		**OILS.**	
Crystal Wax	17 @17½	Pacific Glue Co's	
Eagle	12 @—	Neatsfoot, No 1	1 00 @ 90
Patent Sperm	30@—	Castor, No 1	1 30 @ —
CANNED GOODS.		do. No 2	1 20 @ —
Assorted Pie Fruits,		Baker's A A	— @1 30
2½ lb cans	2 25 @ —	Olive, Plagniol	5 25 @5 75
Table do	3 50 @ —	Possal	4 75 @5 25
Jams and Jellies	3 75 @ —	Palm, lb	9 @ —
Pickles, hf gal	3 25 @ —	Linseed, Raw, bbl.	85 @ —
Sardines, qr box	1 67½@1 90	Boiled	90 @ —
Hf Boxes	2 50 @2 75	Cocoanut	60 @ —
Merry, Faull & Co's.		China nut, cs	72½ @ 73½
Preserved Beef,		Sperm	1 40 @ —
2 lb. doz	3 75 @4 00	Coast Whales	35 @ 45
do Beef, 4 lb. doz	6 50 @ —	Polar	— @ 45
Preserved Mutton,		Lard	60 @ 90
2 lb. doz	3 50 @3 62½	Oleophine	— @ —
Beef Tongue	6 25 @ —	Devoe's Bril't	16 @ 17½
Preserved Ham,		Photolite	— @ —
2 lb. doz	6 00 @ —	Nonpariel	— @ —
Deviled Ham, 1 lb.		Eureka	19 @ 20
doz	4 50 @ —	Barrel kerosene	20 @ —
do Ham, ½ lb. doz	3 00 @ —	Downer Ker	30 @ —
Boneless Pigs Feet,		Elaine	34½@ —
3 lbs	3 75 @ —	**PAINTS.**	
2 lbs	2 75 @ —	Pure White Lead	8 @ 8½
Spiced Fillets,		Whiting	1½@ —
2 lbs	3 75 @ —	Putty	4 @ 5
Head Cheese,		Chalk	1½@ —
3 lbs	3 75 @ —	Paris White	2½@ —
COAL—Jobbing.		Ochre	3½@ —
Australian, ton	6 50 @ 7 50	Venetian Red	3½@ —
Coos Bay	— @ 5 50	Averill Mixed	
Bellingham Bay	— @— —	Paint, gal.	
Seattle	5 50 @ 6 00	White & tints	2 00 @2 40
Cumberland	13 00 @15 00	Green, Blue &	
Mt Diablo	4 75 @ 5 75	Ch Yellow	3 00 @3 50
Lehigh	11 50 @12 00	Light Red	3 00 @3 50
Liverpool	6 00 @ 6 50	Metallic Roof	1 30 @1 50
West Hartley	— @ 8 00	**RICE.**	
Scotch	— @ 8 00	China, Mixed, lb	4½@ —
Scranton	— @— —	Hawaiian	6½@ —
Vancouver Id	7 50 @— —	**SALT.**	
Wellington	— @ 7 00	Cal. Bay, ton	17 00 @24 00
Charcoal, sack	75 @— —	Common	10 00 @12 00
Coke, bush	60 @— —	Carmen Id	12 00 @25 00
COFFEE.		Liverpool fine	18 00 @— —
Sandwich Id, lb	— @— —	**SOAP.**	
Costa Rica	16 @ 16½	Castile, lb	8 @ 15
Guatemala	16 @ 16	Common brands	4½@ 6
Java	25 @— 26	Fancy brands	7 @ 8
Maulla	17 @— —	**SPICES.**	
Greund, in cs	25 @— —	Cloves, lb	47½@ 50
FISH.		Cassia	19 @ ..
Sac'to Dry Cod	2½@ —	Nutmegs	97½@1 10
do in cases	3½@ —	Pepper Grain	14 @ 15
Eastern Cod	— @— —	Pimento	19 @ 20
Salmon, bbls	7 00 @ 7 50	Mustard, Cal.,	
Hf bbls	3 50 @ 4 00	½ lb glass	— @1 25
1 lb cans	1 40 @ 1 50	**SUGAR, ETC.**	
Pkld Cod, bbls	— @— —	Cal. Cube, lb	— @ 14
Hf bbls	— @— —	Powdered	— @ 14½
Mackerel, No. 1,		Fine crushed	— @ 14
Hf Bbls	9 50 @10 00	Granulated	— @ 13½
In Kits	3 00 @ 3 25	Golden C	— @ 12½
Ex Mess	3 50 @ 3 75	Cal. Syrup, kgs	70 @ —
Pkld Herring, bx	3 00 @ 3 50	Hawaiian Mol'sses	18 @ 20
Boston Smkd Hd's	50 @— —	**TEA.**	
LIME, Etc.		Young Hyson,	
Plaster, Golden		Moyune, etc	40 @ 65
Gate Mills	3 00 @ 3 25	Country pckd Cun-	
Land Plaster, tn	10 00 @12 50	powder & Im-	
Lime, Sta Cruz,		perial	35 @ 75
bbl	1 25 @ 1 50	Hyson	30 @ 35
Cement, Rosen-		Fooo-Chow O	27½@ 32½
dale	2 00 @ 2 25	Japan, 1st quality	40 @ 60
Portland	4 00 @ 4 50	2d quality	25 @ 40
NAILS.			
Ass'ted sizes, keg	4 25 @ 4 75		

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending December 3, 1879.

HIGHEST AND LOWEST BARO METER.

Nov. 26	Nov. 27	Nov. 28	Nov 29	Nov. 30	Dec. 1	Dec. 2
29.987	30.190	30.210	30.103	30.005	30.181	30.104
29.882	30.078	30.130	30.031	29.916	30.038	30.040

MAXIMUM AND MINIMUM THERMOMETER.

57	55	56	58	61	62	58
47	45	47	52	53	55	53

MEAN DAILY HUMIDITY.

64.3	62	63	80.7	89.7	91.3	91.3

PREVAILING WIND.

N	NE	SW	SE	SE	SW	SE

WIND—MILES TRAVELED.

165	172	85	120	154	71	67

STATE OF WEATHER.

Clear.	Fair.	Fair.	Cloudy	Cloudy	Cloudy	Cloudy

RAINFALL IN TWENTY-FOUR HOURS.

			.86	1.38	.08	.23

Total rain during the season, from July 1, 1879, 5.15 in.

Annual Meeting.

The annual meeting of the stockholders of the Gould & Curry Silver Mining Company will be held at the Company's office, Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, California, on Monday, the fifteenth day of December, 1879, at one o'clock, P. M. Transfer books will close on Friday, December 5th, 1879, at three o'clock, P. M.

ALFRED K. DURBROW, Secretary.

POSTPONEMENT.

Diana Mining Company.

The day of delinquency of the above assessment is postponed to November 17th, 1879, and the day of sale to Friday, the Fifth day of December, 1879. By order of the Board of Trustees.

J. T. McGEOGHEHAN, Secretary.
Office, 318 Pine St., rooms 13 and 14, San Francisco.

LAND Good land that will raise a crop every year. Over 14,000 acres for sale in lots to suit. Climate healthy. No droughts, bad floods, nor malaria. Wood and water convenient. U. S. Title, perfect. Send stamp for illustrated circular, to EDWARD FRISBIE, Proprietor of Reading Ranch, Anderson, Shasta County, Cal.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Alpha Hydraulic Gravel Mining Company.

Location of principal place of business, San Francisco, California. Location of works, Washington Township, Nevada County, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the Second day of October, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
Alexander Girvin	8	1000	$90 00
Mrs. Catharine Girvin	9	1000	200 00
Thomas Redmayne, Trustee	3	500	100 00

And in accordance with law and an order of the Board of Directors, made on the second day of October, 1879, so many shares of each parcel of said stock as may be necessary will be sold at public auction at the office of the company, 216 Sansome street, San Francisco, Cal., on the Thirteenth day of December, 1879, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

JAMES IRELAND, Secretary.
Office, No. 216 Sansome street, San Francisco, Cal.

Aurora Mining Company—Location of

Principal place of business, San Francisco, California. Location of works, Iowa Hill, Placer County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the third day of December, 1879, an assessment, No. 1, of ten cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the Company, No. 28 Sansome street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Third day of January, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the 19th day of January, 1880, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors. P. CONKLIN, Secretary.

Office, 28 Sansome Street (up-stairs) San Francisco, Cal.

Cataract and Wide West Hydraulic Gravel

Mining Company. Principal place of business, San Francisco, California. Location of works, Eho Mining District, Calaveras County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 15th day of November, 1879, an assessment of Twenty-five cents (25 cts.) per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary at 26½ Kearny street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on Monday, the 22d day of December, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 12th day of January, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

WM. B. LAKE, Secretary.
Office, 26½ Kearny Street, San Francisco Cal.

Land Purchasers' Association.—Office,

No 318 Montgomery street, San Francisco, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment, (installment No. 43), levied on the 5th day of November, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares	Am't.
James E Boyce	No cert. issued	1	$6 00
V Chevalier	No cert. issued	1	6 00
John A Collison	20	1	6 00
David S Hutchinson	251	1	6 00
Mrs M A Hutchinson	252	1	6 00
Chas Lemon	170	2	12 00
Mrs N McCarty	No cert. issued	1	6 00
Mrs W W Newell & D Hicks (guardians)	242	1	6 00
Mrs W W Newell & D Hicks (guardians)	248	1	6 00
Mrs W W Newell & D Hicks (guardians)	247	8	48 00
F A Rouleau	250	3	18 00

And in accordance with law, and an order of the Board of Directors, made on the 5th day of November, 1879, so many shares of each parcel of said stock as may be necessary, will be sold at public auction at the office of the Secretary, 318 Montgomery street, San Francisco, California, on Saturday, the third day January, 1880, at the hour of one o'clock, P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

C. S. WRIGHT, Secretary.
Office, 318 Montgomery street, San Francisco, Cal.

Numa Mining Company.—Principal Place

of business, San Francisco, California. Location of works, Humboldt County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 23rd day of October, 1879, an assessment (No. 2) of Two Cents (2) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 328 Montgomery St., room 21, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 24th day of November, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 15th day of December, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

DAVID WILDER, Secretary.
Office, 328 Montgomery St., Room 21, San Francisco, Cal.

POSTPONEMENT.—The day of delinquency of the above assessment is postponed to December 22nd, 1879, and the day of sale to January 12th, 1880. By order of the Board of Trustees. DAVID WILDER, Secretary.
Room 21, 328 Montgomery street, San Francisco.

Engraving. Superior Wood and Metal Engraving, Electrotyping and Stereotyping done at the office of the MINING AND SCIENTIFIC PRESS, San Francisco, at favorable rates.

RED CROSS OIL!

The Safest and Most Reliable Illuminating Oil. Water White and High Test. Brilliant, Pure and Economical.

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STEEL CASTINGS

FROM 1-4 TO 10,000 lbs. WEIGHT.

True to pattern, sound and solid, of unequaled strength, toughness and durability.
An invaluable substitute for forgings or cast-iron requiring three-fold strength.
Gearing of all kinds, Shoes, Dies, Hammerheads, Crossheads for Locomotives, etc.
12,000 Crank Shafts of this Steel now running proved superior to wrought iron.
CRANK SHAFTS, CROSSHEADS and GEARING, specialties.
Circulars and Price Lists free. Address

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Iron and Machine Works.

THOS. PENDERGAST. HENRY S. SMITH.

ÆTNA IRON WORKS,

MANUFACTURERS OF

IRON CASTINGS and MACHINERY

OF ALL KINDS.

Fremont Street, Bet. Howard and Folsom,

SAN FRANCISCO.

UNION IRON WORKS,

SACRAMENTO, CAL.

ROOT, NEILSON & CO.,

MANUFACTURERS OF

STEAM ENGINES, BOILERS AND ALL Kinds of Machinery for Mining Purposes.

Flouring Mills', Saw Mills' and Quartz Mills' Machinery constructed, fitted up and repaired.

Front Street, Between N and O Streets,

SACRAMENTO, CAL.

PHELPS MANUFACTURING COMPANY,

Manufacturers of all kinds of

Wharf and Bridge Bolts, Railroad Trestle Work, Car Frames and Bolts, Machine Bolts, Set Screws and Tap Bolts, Lag or Coach Screws.

ALL STYLES OF FANCY HEAD BOLTS.

HOT AND COLD PRESSED HEXAGONAL AND SQUARE NUTS, WASHERS, BOLT ENDS, TURNBUCKLES, ETC., ETC.

13, 15 and 17 Drumm St., near California,

SAN FRANCISCO, CAL.

Golden State & Miners Iron Works,

Manufacture Iron Castings and Machinery of all Kinds at Greatly Reduced Rates.

STEVENSON'S PATENT

Mold-Board AMALGAMATORS,

Golden State Pressure Blowers.

First St., between Howard & Folsom, S. F.

California Brass Foundry,

No. 125 First Street, Opposite Minna.

SAN FRANCISCO, CAL.

All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch. ☞ PRICES MODERATE. ☜

J. H. WEED. V. KINGWELL.

WM. H. BIRCH. JOHN ARGALL.

California Machine Works,

BIRCH, ARGALL & CO.,

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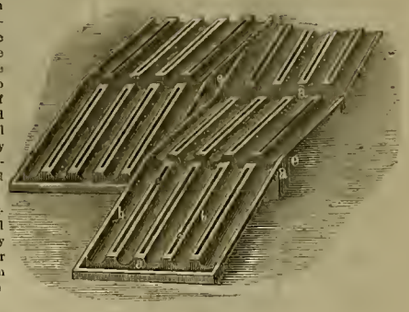

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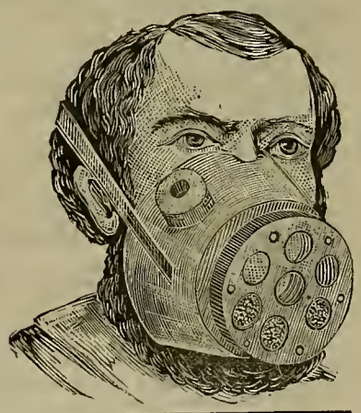

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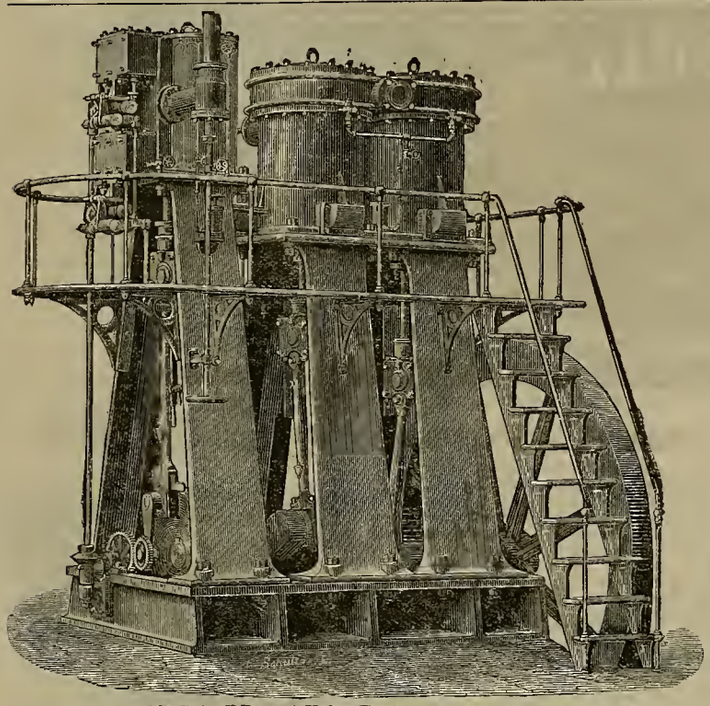

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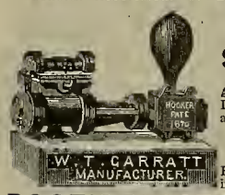

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SAN FRANCISCO, SATURDAY, DECEMBER 13, 1879.

VOLUME XXXIX Number 24.

The Electric Light.

We see by the New York papers that Thomas A. Edison is shortly to exhibit that long looked for achievement of science—the economical subdivision of the electric light. On Christmas eve Mr. Edison promises to illuminate the buildings in the modest little hamlet in which he lives and works. To that end wires have been run from house to house, and connected thence with his laboratory. The illumination will be by means of what might be called electric jets, but which, more properly speaking, are small spirals of platinum and iridium in a state of incandescence in a vacuum. The dynamo-electric machines, whence the current is generated, are already set up in the laboratory. One of these, having a power of forty horses, will generate sufficient electricity for 160 lights, each of 16-candle power, which is the measurement of electric intensity. That is to say, the extraordinary phenomenon may be seen on Christmas day in Menlo Park of electric lights toned down to the intensity of gas jets. In a few days Mr. Edison will begin the task of affixing the jets, so called, upon the gas burners in the several houses. Instead of running the wires that are to transmit the current through the gas pipes, as it is his intention to do shortly in New York, for this occasion he will lay the wires along the pipes.

"I shall send invitations far and wide," said Mr. Edison to a reporter, "in order that all may see that what has been considered as visionary and impossible has been accomplished. The thing is done. I have protected it in this country and every considerable country in Europe. That is to say, there are only a few unimportant parts of Europe yet remaining uncovered, and these will be so before the advent of the holidays. You ask me if I can compete with carbureted hydrogen gas. Let the gas companies reduce their price, and then reduce it again, for it is well known that they can still do this and make money, and I can undersell them and make a large profit." Everybody will watch with interest the results of the proposed exhibition, and Mr. Edison's strong confidence in his plan is not likely to have been gained without being very certain of his premises.

Many others, besides Mr. Edison, are devoting themselves to the perfection of appliances for utilizing electricity as an illuminating agent. Experiments are being conducted on both land and sea. The electric light was not long since experimentally used in the saloon of a new steamer, *Mendoza*, belonging to the Pacific Steam Navigation Company, as she came around from Liverpool to Glasgow. The satisfactory result of this trial is now manifested by the fact that the Pacific Company have entrusted the British Electric Light Company with the work of fitting two electric lights, produced by means of Blandy's patent, from one small Gramme machine, in the saloon of the *Mendoza*. This ship is intended for service on the west coast of South America, and is a beautiful vessel, specially designed and adapted for the particular trade for which she was built. The saloon of the steamer is very large and tastefully decorated. The particular method of applying the light, which has been selected by Mr. Radcliffe Ward, the electrical engineer to the British Electric Light Company, is by reflection from special reflectors in the ceiling of the saloon. The result is a beautifully diffused soft light that effectively exhibits the tasteful painting of the saloon panels.

The success of the light on board the *Mendoza* will doubtless lend to the adoption of similar lighting on board all the principal ocean steamships before long. The illumination of the state-rooms by the incandescent system, in one form or another, is likely to be accomplished ere long. The boon to passengers of being able to turn on a bright settled light at desire will be very great. In this case the light will be placed in globes hermetically sealed. It will be seen that the electricians are doing their best to justify the hopes they raised a little time back.

A BERLIN correspondent announces that the German government will resume the sales of its superfluous silver.

A New Fruit Gathering Apparatus.

We give on this page an engraving of a device for gathering fruit, invented by L. H. Titus, of San Gabriel, Los Angeles county. A hook *A* hangs at the top round attached to a cord with a weight at the bottom, a knot being made on the cord near the hook. The branches may be pulled in with the hook, and the cord passed around the button or the bottom-side of the round. The branch is then held in a convenient position, and both hands may be used to pick with.

B is a hopper, and is made of canvass or cloth, with a spout running into the basket, having a rubber band across the bottom to break the fall and let the fruit in gently. The inventor says that eggs may be dropped from the top of the ladder into the hopper and run through the spout without breaking.

C is a hale or brace which holds the ladder at a right angle; it passes over a rod that runs through the ladder and is notched on each under side, the notches fitting on the rod, making it an easy matter to control the angle of the ladder, it being hung at the bottom on two stumps with a rod passing through the ladder, making it hang on a hinge.

TITUS' PORTABLE LADDER.

A ladder 30 feet high can thus be easily handled, and the fruit gathered without being bruised. A representative of the PRESS recently saw this device in use at San Gabriel, where it appeared to give good results. It does not need any support, so that the limbs of the trees are not apt to be broken. Spikes are placed in the points of bearing which enter the ground and keep the device in position. It may be moved by simply bearing down on the handles and wheeling off in the same manner as with a wheelbarrow or hand-cart, carrying baskets, hook and hopper with it. Manufacturers or other parties wishing to buy county or State rights should address the patentee as above.

THE St. Gothard tunnel makes steady progress, no less than 3,000 workmen being engaged upon it. Nearly 10 tons of dynamite are used per month.

THE spinners of Oldham, England, demand 10% increase in wages.

DEATH OF A VETERAN MINER.—Capt. Williams, of the famous Van mine in Wales, died about two weeks since. His life has been very eventful and is a striking illustration of force of character and indomitable perseverance, combined with honest industry, which surmounted every obstacle. After being connected with many mines, he began working the celebrated Van in 1854. He continued in the management until his death, a period of about a quarter of a century. It was in the year 1865 that he cut the great productive lode, and so confident was he of the certainty of this great discovery to be made that he conducted the management, for a period of eight years, up to 1865 gratuitously. He did this to encourage the proprietors, and in furtherance of what he estimed his life work. In 1868 he took exclusive charge, and since then he carried out the developments underground and on the surface, which have rendered the Van mine possibly the most celebrated of its kind in Great Britain. Many great improvements in the working of this great and difficult lode were effected by Capt. Williams, and improvements in the dressing department have been carried out to such an extent that these mines may be said to as nearly approach perfection as can well be looked for. They remain monuments of his genius and ability—no mean legacy to posterity. His consideration for his workmen had ever a foremost place in his mind, and the large chapel, with schools and reading rooms attached thereto, bear testimony to his zeal in the interests of his men.

IN the reign of Queen Anne a great discovery of silver was made in the Ochil Hills in Scotland, on the estate of Sir John Erskine. The ore was so rich that 14 ozs. of it yielded 12 ozs. of silver. For a time the mine paid a profit of £4,000 a week, and then failed. Sir John, walking over the estate with a friend, said, pointing to the shaft: "Out of that hole I took £50,000;" and then, walking a little further, and pointing to another shaft, continued: "But I put it all into that hole!" How often in this latter respect does history repeat itself?

MR. GEORGE H. STRONG has been appointed Inspector of Rifle Practice for the First Regiment, National Guard of California.

Why Our Copper-Mining Interest Should be Encouraged.

With an almost culpable degree of short-sightedness in the capitalists of the Pacific slope, the very important branch of industry of copper mining has been suffered to languish and to be almost extinguished. With a copper field unequaled in its extent by those of any other portion of the world, it has been so completely ignored that the vast treasures which it contains are now lying dormant in the veins and ores beds. This inertia exists regardless of the fact that the copper consumed on the coast amounts yearly to several millions of dollars in value. This sum has to be sent away from our shores to other ports, for the purchase of what is only awaiting the encouragement of capital to be produced here, and thereby not only increase our home wealth to that amount, but also to keep for home circulation the money now expended for it. The shipments which would be made of the surplus product, would bring back to us a large amount of coin, thereby augmenting our local wealth.

Ingot copper has advanced about 43% in price within the last few months, and is still appreciating in value. This advance will increase our shipments of coin to pay the excess in price, and we consequently lose the benefit of it, which would have inured to us, if our copper mines had been duly sustained during the past few years.

Had this been done thousands of workers would now be employed, and the wages they would receive would be in circulation among us. New mines would be opened and a wider field would be brought into profitable operation; adding to the value of now almost unnoticed properties, and giving rise to new industries closely associated with the copper interest. Smelting works would have been erected and rolling mills established in the mining centers of the coast.

This latter branch of the copper industry could now be successfully maintained, and a safe field for investment is awaiting such capitalists as may have the spirit to foster this department of labor, which has ever been in other localities, where such works have been put into operation, a source of profit to their owners. They would also react to the advantage of the investors, inasmuch as they would incite prospectors to discover new veins, and by thus increasing the quantity of copper produced, give an additional impetus to the copper interest and an enlarged scope to the business of the furnaces and mills.

It would require a paid-up capital of $300,000 to establish this industry. It would take $150,000 of it to erect and put in operation a well appointed rolling mill with all the necessary machinery for turning out sheet, bar and wire copper; also to make copper bolts, nails, rivets and yellow-metal. The balance of the capital would be required for the business of the enterprise, in the purchase of copper and incidental expenses needed to its successful advancement.

The duty upon foreign copper is as follows: Pig, bar and ingot, 5 cents; old copper, 4 cents per pound. Manufactured and copper nails, 45%; yellow-metal and zinc nails, 35%, *ad valorem;* all else, 10%.

The last Eastern advices give the following market quotations: Firm and active. Sales one week ingot copper 850,000 lbs. @21¾@21⅞ cts. cash; 22½ cts. for February delivery.

Copper sheathing and nails	22 cents.
Yellow-metal sheathing and nails	18 "
" " bolts	22 "
Copper nails	25 "
" bolts	24 "
Brazier's copper, in all sizes, from	24 to 30 "
Old copper	16 "
Old yellow-metal	8 "

The quotations of the Eastern markets will hereafter be given weekly, for the benefit of the copper-mining interest.

MR. PETER STAINSBY, at one time known as "the great mining king" in England, died recently at his residence in London. At one period he had invested in lead and tin mining companies half a million sterling.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

I. X. L. District, Nevada.

EDITORS PRESS:—This district is situate in Churchill county, Nevada, distant about 25 miles from Stillwater, the county seat of the above county. It is less than a year since the developments I am going to mention have come to light. Yet it is no new discovery or wildcat excitement, for as early as the year 1861 several prospectors located here, but having no means to reduce the ore, they finally abandoned it. The following year, 1862, the Yankee Blade district excitement broke upon the mining world with great promises for the future. Several of the best citizens of Nevada rushed forth to the new El Dorado, among whom were ex-Governor Bradley, John G. Post, Abe Edgington, Al. McCausland, and others, but met with the same results that their fellow prospectors met with one year before, and from the very same cause—no means of reducing the ore.

Last year a party of prospectors visited Eureka, among whom were John L. Colvert, Pete Maloney, Mr. Higgins, and others, and called on Mr. J. S. Allen, of the Ottawa hotel in that place, and showed to him some samples of ore from the I. X. L. district. Mr. Allen had the samples assayed, and the following returns were obtained: East Star mine, from four samples, highest $500.37, lowest $104.28; Bayfield mine, returns from five samples, highest $1,008, lowest $98.73; Gilroy mine, six samples, highest $964.40, lowest $310.80. Mr. Allen at once left Eureka, and visited this place, and found the different ledges even better than they were represented to be, and at once set to work to open some of the leading prospects of the place, among which are the East Star, Bayfield, Gilroy, Stonewall Jackson, and a host of others too numerous to mention here. Mr. Allen has displayed the greatest tact since he has visited this district, and it is due to his good management and liberal patronage that the district appears as it does to-day.

There are about 50 men here at present, and parties coming in daily. But it is not our wish that anyone should come before spring—beyond agents or experts to examine the district—for as yet no accommodations have been made to receive families or others that are not used to roughing it. In the early summer, a fine 20-stamp mill is to be built; and as a beautiful town site has been already laid out, we feel that I. X. L., ere another year rolls around, will take her place side by side with many of the bullion-producing camps of Nevada.

The main ledge in this district can be traced for at least a distance of eight miles, and at any place that has been touched, it has not failed to give rich assays—some of the returns you have read above. There is an abundant supply of wood and water in the immediate vicinity of this place, and a most beautiful climate. From its sheltered location and broad, sunny valleys that lie adjacent to the district, almost anything that is grown in California can be raised here with success. Cereals and bulbous roots of all kinds cannot be excelled in any part of the Pacific coast; features that will go forth to make it one of Nevada's producing towns when the lesser and more barren camps of the State will have past to oblivion.

This district is at present well worth a visit from some of the leading mining men of the Pacific coast. There will be very little lost in paying this place a visit; but, on the contrary, all to gain by investing in it, for every mining district has to be discovered before developed; therefore, gentlemen, come and see for yourselves. Should it prove to be a second bonanza, all right, or a much less object (say one that would add many millions of dollars to the general commerce of the country), it would be no mean affair; the latter object is now in sight, only awaiting the touch of capital to develop it. I. X. L. district is a field well worth the investigation of capital, and he who comes first will have the best showing. The best way to come here is by way of Austin, this State, where full directions will be furnished to travelers wishing to visit this place; or Wadsworth, via Stillwater, as parties may desire.

T. L. CONRAN.

Nov. 24th, 1879.

IMPORTANT TO BREWERS.—Judge Dyer, in the United States Circuit Court at Milwaukee, Wisconsin, on Dec. 2d, decided the case of Matthew Godfried against the Philip Best brewing company, sustaining the complainant's patent. The decision is of great importance to brewers, as it makes them liable for royalty for the use of the process and apparatus for pitching the inner surface of kegs and barrels, which have been in use in large breweries for several years. It is understood that other large brewers, including those of Illinois and other States, have stipulated to abide by the decision, subject to its confirmation by the Supreme Court.

THE total production of anthracite coal for this year is estimated to amount to about 26,500,000 tons, or about 3,750,000 tons more than was ever before produced in one year, and 8,250,000 tons more than was produced last year.

Wood River Region, Idaho.

The Yankee Fork *Herald*, of November 22d, contains new and interesting information concerning the mines of Idaho. Speaking of the wealth of the Wood River region and the magnificent showing in the base range, it says that this season is the first time in which it began to attract the attention of prospectors and miners to any great extent. For several years past it was no secret that galena ores were abundant in that portion of Idaho, but discoveries and developments were limited until the past summer and fall. The prospects of an early railroad from some point on the Utah & Northern through to Oregon, and passing near the Wood River mineral field, stimulated prospectors to turn their attention in that direction. It is gratifying to note that their efforts are rewarded with many rich finds.

So far, four or five different galena belts have been opened up, and it is the belief of all who have explored in that section, that belt after belt of argentiferous galena ores exist all the way from the low hills at the base of the Wood River range to the divide of Wood and Salmon rivers, a distance of 45 miles. In length this great belt of high grade galena and carbonate ores extends in a southwesterly direction from Bay Horse district, near Challis, through by the head of East fork to Wood river and over to the south tributaries of the Boise. This makes the most extensive base range known, being from 20 to 40 miles in width and in length from 130 to 140 miles.

In the mines of the Lower Wood River district, which are divided into two camps, known as Jacobs' and Callahan's, the veins vary in thickness from one to two and one-half feet. The ores are galena, easily smelted, running from 40% to 60% lead and from $80 to $250 silver. There is an abundance of iron in the vicinity. The leads are generally well defined with bold croppings. It is a well watered and wooded section, and the hills are covered with bunch grass. It is a mineral country all along the base of the mountains, and once the railroad is completed thus far, the ore will be brought to easy market. The first mines were discovered in 1877 by a man named Jacobs, from whom the camp takes its name.

The distance from the old emigrant road to Bonanza via the Wood River and Saw Tooth districts is about 103 miles by the survey.

The ore in Callahan district, six miles above Jacob's Camp, on the main Wood river, is similar to that found in other parts of Wood river, carries a large per cent of lead and considerable oxide of iron. The ledge is four feet wide, with a vein of good smelting ore two to three feet running through it. The Callahan is the best developed mine on the river. There are eight or ten leads besides the Callahan, equally good and strong as the latter. The ore is easily reduced, carries about 60% lead, and from $150 to $300 silver per ton.

The climate is favorable for a winter camp. Wood, water and grass are not lacking in quantity or quality.

The Warm Spring Creek mines give promise of developing into important producers of lead and silver. The creek is a tributary of Wood river coming in from the west and is properly the west fork of Wood river. It is about 20 miles above the emigrant road, and nearly midway between Upper and Lower Wood River mines, hence the camp is sometimes mentioned as Middle Wood River district. The mineral belt is located about 10 miles from the mouth of Warm Spring creek, and was discovered the past summer by James Steele, John Boyle and Billy Short. The first mine, the Idaho, located June, '79, by Boyle, Giles, Kinney and Butler. There is an open cut 20 feet long and 15 feet deep on the ledge, exposing a large body of antimonial silver ore that assays from $80 to $205 per ton.

Wood River is the next location on the creek, made by Boyle and Giles and adjoining the Idaho. Shaft 10 feet deep on the vein, showing a good body of ore that assays on an average $150 per ton; is in porphyritic granite, showing considerable iron, formation loose but not broken.

Black Horse—Discovered and located by John Boyle. Shaft and open cut exposing two feet of galena ore, that assays over $300 per ton silver and 40% lead. Formation lime. Ten Broeck—Located by Moffitt and Ervin, in August last. From 12 to 15 inches of galena and antimonial silver. The vein is exposed for nearly 100 feet by shafts and open cuts, with a "blow out" of several tons of ore. Assays from $150 to $275, and 40% lead. The ledge cuts the country rock, making a true fissure vein. Ervin—This is a contact vein lying between the lime and granite—granite foot wall and lime hanging wall. Ledge six feet two inches wide, showing four feet of galena ore assaying from $140 to $245 silver, and 40% to 60% lead. Shaft on discovery 15 feet, cutting the vein. Open in a number of places; 300 feet from discovery is a cut on the vein, which shows from four to five feet of galena, with small quantity of oxide of iron. Discovered by Ervin and Moffitt. Sovereign—Discovered by Wm. Thompson, on Thompson creek, a tributary of Warm Spring creek, about one mile from the Idaho. An open cut on the ledge 16 feet from the surface, showing a magnificent body of gray carbonates, that assays from $200 to $900 per ton silver and 45% lead. The croppings are large, showing thousands of tons of ore that assay $30 to $35 per ton. Indian Boy—Extension of the Idaho on the north, located by Wm. Thompson. This is a small vein, well defined, carrying ore that assays from $100 to $300 silver. Developments limited. Ontario—Owned by Chambers, Hathaway and Rooks. Vein 18 inches, averaging with the other ledges of the camp. Hathaway, Niagara and North Star—Similar to the Ontario, and owned by the same parties. Comet and Accident—Located by Sullivan and Mulky. Opened by shafts at different points on the vein, showing extensive bodies of antimonial and galena ores. Gopher and Old Abe—Located by Ervin and Moffitt. These are well-defined ledges, developed by open cuts, showing prominent veins that assay from $400 to $600 silver and a few dollars gold. The country rock is lime and granite. The veins run northeast and southwest, and dip east. The mines are favorably located. There is a natural wagon road up Wood river to the mouth of Warm Spring creek. The altitude is about 5,000 feet. There are no indications of heavy snows, and no traces of snowslides. The first of May last, bunch-grass was a foot high on the south hills.

The valley of Wood river, in the mountains, is from two to ten miles in width, well adapted to the cultivation of cereals and vegetables as far up as the mouth of Warm Spring creek, and for a stock country it is unexcelled. Wood and water are in abundance, and the climate is particularly advantageous for a winter camp.

Warm Spring creek heads against the Smoky, and is as large a stream as Yankee Fork, carrying, at its lowest stage, 2,500 inches of water. On the head of the Smoky, which forms the head of the Boise river, a number of locations were made this season, of gold and galena ores. There has been but little prospecting in that locality, but the indications are favorable for a large belt of gold quartz and silver ores.

The mines on the Upper Wood river are similar in character to those of Middle and Lower Wood river. Although ledges were discovered there previous to this season, little interest was attached to the mines until July last, when the abundance of the ore and the high assays attracted the attention of miners far and near, and many parties outfitted and went into explore for mines. In all about 75 locations have been made, many of them of great promise.

Last September the prospectors held a meeting, laid off a town called Galena City, and organized a new mining district known as the Wood River district, and elected James Fulton Recorder, who was subsequently appointed a deputy by the Recorder of Alturas county according to the Territorial law. This saved the prospectors many miles of travel to and from Rocky Bar to put their claims on record. The district extends to the Salmon and the Saw Tooth, and embraces about 600 square miles of territory. The mines of Upper Wood River proper are all in the vicinity of Galena City. The belt, so far as developed, is about three miles in length and two in width. It is a network of veins; the croppings prominent and often traceable for thousands of feet. The Wood River ores carry from 40% to 75% lead, and from $80 to $300 silver, sometimes much higher than this in silver. Most of the veins bear no trace of gold, but an occasional one is found which shows from $5 to $25 per ton.

Galena City is five miles from the dividing waters of the Salmon and Wood rivers, and 12 miles from the Saw Tooth mines. The trail leads over a low divide to the Salmon, over which a wagon road can be constructed with little cost or labor. From these mines to the Warm Spring Creek mines, the distance is about 25 miles, and down to the old emigrant road about 50 miles. There is a natural wagon road up Wood river to within a short distance of Galena City. With its numerous rich mines, and its inexhaustible supplies of limestone, iron and wood, the Wood River country must, in the near future, become a great field for the reduction and shipment of its ore.

About Horse Power.

Horse power is a unit of power established by James Watt to be equivalent to a force of 33,000 pounds acting with a velocity of one foot per minute, which is the same as a force of 550 pounds acting with a velocity of one foot per second. That is to say, one-horse power is 550 foot-pounds of power or effects, or 11-man power of 50 effects each. The product of any force in pounds and its velocity in feet per second, divided by 550, gives the horse power in operation. In Watt's rule for horse power is given a velocity of only one foot per minute, which is equal to 0.2 or one-fifth of an inch per second—about the velocity of a snail. The force corresponding to this velocity is 33,000 pounds, or about 15 tons, which is too large for a clear conception of its magnitude, and a horse can never pull with such a force. A horse can pull 550 pounds with a velocity of one foot per second, which is the most natural expression for horse power. This expression is used on the continent of Europe as follows:

Countries.	Terms.	Units.	Eng. equiv.
English.	Horse power.	550 foot-pounds.	550 ft. lb.
French..	Force de cheval.	75 kilogr. metrs.	542.47 ft. lb.
German..	Pferde kraft.	513 Fuss-funde.	532.25 ft. lb.
Swedish.	Hast-kraft.	500 skalpund fot.	542.06 ft. lb.
Russian.	Syl-lochad.	550 Fyt-funt.	550 ft. lb.

SILVER MINE IN OHIO.—Recent news from Ohio relate that lead and silver ore have been discovered on a farm near Cynthiana. Mr. Porterfield, the owner, has sunk a shaft 25 feet, and specimen ore from the bottom assayed 860 pounds of lead and 18§ ounces of silver to the ton.

Fluor-spar in Yolo County.

The Sacramento *Record-Union*, in its issue of November 29th, contains an account of a ledge of fluor-spar found near Winters, in Yolo county. Speaking generally: Spar is a mineralogical term, applied to certain crystallized substances which easily break into cubic or prismatic or other fragments with polished surfaces. There are several varieties of mineral which very closely resemble spar, and it is difficult, without close test, to distinguish some of the agate formations from spar. There is a compound of baryta, the sulphate of which occurs crystalline. Native sulphate of baryta is known as heavy spar. It is found in quantities in Cumberland and Westmoreland, England. Fluor-spar is a mineral product common in Derbyshire, England, and noted for its great beauty. It is generally crystallized in cubes, but its primitive form is octahedron. It is of various colors, often beautifully banded, especially when in nodules, and is much prized for the manufacture of vases, and is occasionally used for heads, brooch stones and other ornamental purposes. Feldspar is harder than spar, and generally light colored. Calcareous spar is white and soft. The beautiful specimen before us we should then class, without chemical analysis or more than test of the eye, as spar of the variety which is hardest, and bears so close a resemblance to agate as to deceive regarding it until its hardness is tested, when it is found to be coarser and more brittle than agate. The specimen was brought to this office by Israel Luce, marble worker. It was found in what is thought to be ledge formation, near Winters, Yolo county, in the same general range with the onyx quarry near Benicia. It is said that a large ledge or quantity of it has been traced at Winters, and that the specimen before us is from the top and presumably not so fine as at greater depth. The specimen has been polished by Mr. Luce and found to work easily, but is of close texture enough and of sufficient strength to bear working up into ordinary forms. It bears a high polish, quite equal to that the best marble will take. It is translucent, and held to the light at a point an inch thick the delicate brown shades of the mineral are shown charmingly blended. The face of the specimen shows a series of handsome meeting arches some three inches span each and composed of alternate bands of black and bluish narrow lines and broad, delicately shaded ones of brown, salmon-colored and tinted as if with burnt umber, brown sienna and finally with a mixture of these and Indian red. Below these arches are rosettes of like shadings. These figures closely resemble the beautiful hand formations found in agate, but exceed them in boldness, size and delicacy of color. This quality of spar, or crystallized rock, would make splendid mantel ornamentation in panels, face of keystones and supports, etc., and fairly rival onyx. It is probable, too, that it would answer the same purposes accomplished by encaustic tiling, and certainly from the fantastic yet orderly character of the grain and tinting and natural figure work in the spar, would exceed it in beauty. Larger specimens are to be brought to this city and polished and tested.

Cajon Pass Coal Mine.

During the month of February last, a Mr. A. C. Sizemore discovered a coal claim in the Cajon Pass, 18 miles north of Colton, and on the direct line of the Los Angeles and Independence railway as surveyed. Mr. Sizemore was attracted by an outcropping ledge which showed 18 inches of decomposed coal, and could be traced for about three miles in length. Work has been commenced in earnest on the ledge. At last reports the shaft was down a distance of 265 feet, and was still being pushed vigorously ahead. The ledge trends downward at an angle of 45° with the perpendicular. It has well-defined sandstone walls six feet apart, and casings of slate, inside of which the coal appears varying from 18 inches to three feet eight inches in thickness. The strata are said to average about as follows:

Hanging wall of sandstone. Slate casing, 6 inches; coal 12 to 18 inches. Coal and clay mixed of variable thickness. Coal 8 to 10 inches; slate casing 6 inches. Foot walls of sandstone.

The coal near the surface is quite soft, but becomes harder as the depth increases; it also appears to be impregnated with oil, something like cannel coal. It makes a perfect combustion, and leaves a white ash. The mine has been visited by several naturalists and expert coal men, and they one and all pronounced the indications to be those of a true vein. In this respect the ledge is different from any other thus far found in this part of the State.

We understand that Prof. Hilgard has made a critical examination of the coal. It has likewise been put to a practical test by various establishments in our city, and it is pronounced by all to be the best coal ever found in the State. The only question of the success of the mine turns upon the development of a ledge of sufficient thickness to make its working profitable. It is understood that if a continuous vein of four feet is disclosed the mine can be disposed of at a very handsome figure. To put the matter to a thorough test, the owners of the property have extended the time of their agreement with Messrs. Palen & Saleshery six months, and preparations are now being made to enlarge the facilities for work so that the shaft may be continued to a depth of 500 feet.

MECHANICAL PROGRESS.

Rock Drill Carriage.

To ensure the largest possible amount of work done by the drill Mr. James McCulloch, engineer, of Manchester, has invented an apparatus or carriage to be used for supporting or carrying rock-drilling machines for mining, tunneling, and similar operations, and designed to provide an apparatus which will be of great strength, simple in construction and operation, and which will, moreover, afford means whereby the drilling machine may be very quickly and easily adjusted to different positions. By employing an apparatus constructed according to his invention one attendant is enabled to set the machine to work in any desired position and at any angle without loss of time, and with slight exertion. A drilling machine mounted upon this carriage or apparatus may be readily adjusted to the varying hight and width of the headings; also to a position for drilling holes at any part and at any angle of the face of the same without removing the carriage from the position in which it is fixed at the commencement of the operations. In carrying the invention into practice he employs an ordinary bogie or truck, which may be on wheels or otherwise; upon this truck he provides a bed-plate, upon which is mounted a vertical tubular bar, which has a screw thread formed upon it. This vertical bar is so arranged that it may be raised and lowered by a screw nut whose outer periphery forms a worm wheel. With this worm wheel is geared a worm fixed upon a horizontal shaft, which may be operated by a crank handle outside the frame of the truck. By this arrangement the vertical bar can be tightened up against the roof to any pressure as may be required, leaving the apparatus in a thorough solid position. Upon the vertical bar he provides a double universal clamp or cross head, which serves to support a horizontal tubular rack bar. This part of the apparatus is arranged to be raised and lowered by means of another screw nut, whose exterior periphery forms a worm wheel, and is geared with a worm fixed on a shaft supported in bearings on the clamp. The rack bar is caused to travel in an horizontal direction by a toothed pinion, which engages with the teeth on the bar, and is operated by a crank or handle at the side of the cross head. The horizontal bar is also moved in a circular direction by means of the clamp or cross head. This rack bar is tubular, and encloses a shaft screwed at one end, its screwed part working into a pivot or end piece for adjusting the bar when in working position. At one end of the shaft there is a self-acting weight, which acts upon the pivot when it is required. By this arrangement the horizontal bar is kept in a constant rigid position while the drill is at work, and at the same time it does not alter the position of the drill from the line of the hole just started. The drilling machine may be mounted upon the horizontal bar, or if required on the vertical bar. It will be readily seen that a rock-drilling machine placed upon an apparatus constructed as above described may be adjusted to any required position or angle without moving the truck whereon the said apparatus is mounted.—*London Mining Journal.*

ANOTHER AUDIPHONE.—The Cincinnati *Gazette* says that Prof. J. W. Graydon, of that city, has invented an audiphone which is claimed to be a great improvement over the Chicago "fan" audiphone. It consists of a small electro-microphone, to the center of the diaphragm of which is attached a cord, which may be of any length, and to the other end of which cord is attached a small piece of wood. The manner of working the instrument is very simple, and can be briefly described as follows: The deaf person takes a firm hold of the piece of wood between his upper and lower teeth, and the party desiring to converse with the deaf talks through the electro-microphone attachment at the other end of the cord, holding the cord taut. The theory advanced is that the sound is conveyed through the nerves of the teeth and the bones of the face to the auditory nerve, which, owing to some defection in the ear, caused by disease, is not approachable through the usual channel, thence to the brain. The instrument will only work, however, when deafness has been caused by disease. In case of paralysis of the auditory nerve it is useless. Some very interesting tests of the audiphone were made at the deaf and dumb department attached to the Third Intermediate school recently. Among others was one, a bright looking little colored girl, who was entirely deaf. The Professor talked to her at a distance of 25 feet through the instrument, and she repeated after him everything which he said. Another was a little girl who had been deaf and dumb from birth. Using the mute alphabet, she informed the teacher in charge that she could hear that one statement of the Professor was made in a louder tone of voice than another, but that she could not understand what he said, never having been able to hear such sounds before.

PHONOGRAPHIC MACHINE.—Sig. Darlo Mazzel, stenographer to the Italian Senate, has invented a machine which claims to produce a speech in the ordinary printed characters as rapidly as it is spoken, a word of several syllables being recorded by a single touch of the keys.

Signals in Mines.

George C. Phillips, of Silver City, Nevada, writing to the *Territorial Enterprise*, of Virginia City, proposes two new plans for signaling in mines. Mr. Phillips says:

Some time since two ideas entered my mind; the first plan is to have a small wire cable extending from top to bottom of the shaft, and at every 400 feet could be placed a small cylinder and piston; a small cord could be extended up 200 feet and down 200 feet from the small cylinder; this small cord could be engaged with a valve or connected with a valve, so as to cause the piston in the small cylinder to pull the main bell rope a certain distance every time. If a small cylinder was placed at every 400 feet each piston could be so engaged to the bell cable as to operate or move the cable a sure and certain distance every time independent of each other, those pistons could be operated by compressed air.

My second plan is to have a three or four-inch pipe or tube extend from top to bottom of the mine, and at every 400 feet this pipe or tube could be enlarged so as to receive a bell, while from this enlarged part a line could be extended up 200 feet and down 200 feet from the bell, and so on until the bottom is reached. The bottom end of the pipe should be closed and a small jet of compressed air admitted near the bottom of the pipe, so as to propel the sound of the bell upwards, and the upper end of the tube should come close to where the engineer has to perform his duty. Either one of those plans will answer the purpose.

You remember my suggestion about entering the smoky mine. Some of my friends say it cannot be done, and ask whether I could go up the smoke stack of a boiler when the stack is full of hot smoke. I intend to demonstrate the whole thing to them soon.

IMPROVED COLLIERY WINDING-GEAR. — A new system of winding-gear, known as Kaepe's, has been adopted at many of the collieries in Germany and France, and is being introduced at some of the collieries in England. The principal feature in the new system consists in doing away with the ordinary drum and the great weight of rope, which in deep mines is a very great strain upon the engine. In Kaepe's system the cages are attached to each end of the winding rope, which passes over the head-gear pulleys and over a winding pulley, which takes the place of the drum, and a balance rope of the same weight as the winding-rope is fixed to the bottom of each of the cages, and hangs freely in the shaft, its lower end being allowed to dip into the sump at the bottom. By this method, however deep the shaft, the ropes and cages are always balanced, and the engine in winding up has only to overcome the weight of the rope in the shaft and the friction of the working parts. A steady engine speed is thus secured, whilst considerably less power is required, and the risk of overwinding is very much reduced. The system has answered satisfactorily where it has been tried, and is spoken highly of by mining engineers. Engines and winding apparatus on this principle are at present being constructed at the Bridgewater Foundry, near Manchester, for the Bestwood Coal Company, Nottingham.—*Universal Engineer.*

GLASS TUBING.—The manufacture of glass tubing is surprisingly simple. The glass blower takes a small quantity of melted glass from the pot with his blowing tube, rolls it slightly on a marble slab to give it a cylindrical form, he then adds a small quantity of glass from the same pot and blows the enlarged mass while rolling it, taking great pains to keep the shape cylindrical. If tubes of large caliber are required, the inside diameter of the cylinder is enlarged and the glass is allowed to cool slightly before drawing. For tubes of very small caliber, such as thermometer tubes and other capillary tubes, the internal diameter of the cylinder is decreased and the glass is used very warm. In making a piece of glass tubing, the assistant places a ball of glass against the end of the glass cylinder by aid of his blowing tube. Now the men, each holding an end of the glass cylinder by means of their blowing tubes, begin to separate, walking backward. The cylinder is thus lengthened, and at the same time made smaller in diameter, and the diameter, of course, depends upon how much the tube is drawn out. When the tube has attained the right size, it is generally too warm and soft to admit of laying it down without destroying its shape; it is therefore cooled by means of a fan. When it becomes sufficiently cool, it is laid upon a series of equidistant parallel wooden blocks of uniform hight, where it remains until it becomes cold. It is then cut into lengths with a diamond or a file. If the tubes are to resist great pressure or changes of temperature, they are annealed with great care. They are sometimes plunged into boiling linseed oil and slowly cooled.—*Scientific American.*

SLIDE-VALVES.—Improvements in slide-valves for portable, traction, stationary, and other engines, have been recently patented in England, by Messrs. Clayton & Shuttleworth, of Lincoln. These parties construct the slide-valve with two faces placed at an angle—preferably a right-angle—the one to the other, the port face of the cylinder, to which the valve is adapted, being made of an angular recessed shape, to correspond therewith. The joint width of the two combined faces containing the steam ports is of the same superficial area as the valve ordinarily used. The orifice for the reception of the valve rod is placed at or near the center of the triangle formed by the end of the valve, this point being practically the center of adhesion; hence, the cause which produces the tilting or rolling motion above referred to is removed, and the valve will retain indefinitely a steam-tight force. This improvement is said to remedy the tilting or rolling motion of ordinary slide-valves, which wears the face to a convex form, causing a wasteful escape of steam.

SCIENTIFIC PROGRESS.

The Problem of Solar Radiation.

One of the most stupendous problems staring the modern physicist in the face, is to explain how it is possible that the solar energy, which reaches us in the form of heat, can pass through millions of miles of that space through which the earth is being driven by its momentum, and in which space a most intense cold prevails.

If the earth had no heat of its own, this solar radiation would be incompetent to heat its surface to such a degree as to make organic life possible. This is proved by the perpetual snow on high mountain tops, which lose so much more by radiation than the valleys and plains, that the interior heat of the earth cannot keep them at a temperature above 32° Fah. It is proved by the low temperature prevailing on the surface of the moon, which, being so much smaller than the earth and possessing little or no atmosphere, has long since lost the heat required for organic life. It is also proved by the fact that the mean temperature of the ground is always a little higher than that of the air, and increases with the depth, and finally, the 200 active volcanoes on the earth's surface, with the numberless hot springs, are the most potent proofs that the earth's interior must be very hot, and loses this heat only very gradually.

That this terrestrial heat is, at the present stage of the earth's existence, utterly incapable of developing organic life, is proved by the low temperature prevailing at the poles, where the formation of ice is due to the deficiency of solar heat, while on the mountain tops it is due to the insufficiency of terrestrial heat.

Still, however evident and clear is the action of this terrestrial heat, the transmission of the solar heat through millions of miles of a medium so attenuated as to surpass the best vacuum we can produce in our air pumps, is, at the present condition of our knowledge, an apparently insoluble puzzle, and has become more so since the discovery that heat is merely a mode of motion, and, like light, a mere vibration of material molecules. The question is, how can the motion of that interplanetary medium, which is apparently a mere nothingness, evolve through such enormous distances the stupendous energy on our terrestrial surface, which energy is consumed in the raising of water into clouds, and its return as rain and water-power; it is consumed in raising winds and storms, in evolving vegetable and animal life, in short, in performing all the functions portaining to a live planet. How is this stupendous energy, or latent motion, transmitted through a mere nothing? That is the question.

A New Piston Packing.

A paper was lately read before the Institution of Engineers' and Ship Builders' of Scotland by John Turnbull, Jr., in which Lockwood's new piston packing was referred to. This packing has a spring ring, designed to press the packing rings outward against the walls of the cylinder, and at the same time to press the rings apart against the flat faces, each motion being independent of the other. In plan, it represents a series of contiguous segments of a circle, and in section a single segment of a circle. It is made of steel wire equal in section all through, and in one piece for any diameter of cylinder, thus rendering it equally elastic at all points. The ends are secured together by means of a double-ended bolt, having a solid washer between; and the bolt is made long enough at both ends for additional washers being put on at any time after the ordinary tear and wear of the cylinder and packing rings requires increased tension on the spring ring. The latter is considerably lighter than both the ordinary cast-iron or the helical coiled spring rings. The packing rings have a continuous cavity round their outer circumference, not so much to reduce the friction as to form a receptacle to retain the lubrication and moisture from the walls of the cylinder. Such an arrangement is especially suited for engines having separate exhaust ports, and whose cylinders are horizontal. The inner edge of each packing ring is made parallel for some distance toward the faces, so that the spring ring can enter easily and without any compression; while by the gradual screwing up of a junk ring, the packing rings are brought closer together, and permitted just to touch each other by their inner edges and not to press unduly. During the operation of screwing up, the packing rings are gradually distended by the points of the spring ring acting on an inclined plane, until it comes upon the protecting flanges, when compression downward begins. After the junk ring is firmly screwed up, a hoop-iron gland may be applied round the packing rings to draw them into the diameter of the cylinder, so as to enable them to enter. The gluts or tongue-pieces are made the whole of the width of the face, so that they cannot get out. In the discussion which followed, several engineers present gave the results of their experience, which was pronounced to be favorable.

Instantaneous Fuse.

An improved igniter and instantaneous fuse has been introduced by Bickford, the object of which is to provide a cheap and simple means for firing a number of blast-holes simultaneously, in place of the electrical apparatus used exclusively hitherto. The new system was exhibited and tested recently before the Mining Institute of Cornwall. It consists of a little cylindrical case of tin plate, devised so as to contain an ordinary safety fuse at one end, and at the other a set of instantaneous fuses, which may be of any number from 4 to 16, representing the number of holes required to be blasted. Between the end of the safety fuse and the ends of the instantaneous fuses is inserted an explosive disk, the action of which is such that on the communication of fire from the safety fuse, the whole of the instantaneous fuses are immediately ignited. The igniter tested contained eight instantaneous fuses, an average number for ordinary mining, and the simultaneous effect of the ignition was at once seen and considered satisfactory. On commencing to show a second similar set, it was suggested by one of the gentlemen present that detonating caps be attached to the end of the instantaneous fuses, so as to enable the company better to judge of the absolutely instantaneous discharge of the quick fuses. Caps were accordingly attached to the instantaneous fuses, which had been purposely constructed of the proper diameter, as their use has hitherto been most frequently with dynamite. The safety fuse having been ignited as before, one single report caused by the explosion of the eight detonators soon followed, showing that the eight fuses had been ignited and conveyed their fire almost instantaneously.

It was stated that this new fuse had been proved to burn at the rate of 100 feet per second, and there next followed an interesting experiment tending to show what an exceedingly rapid rate of combustion was obtained with this fuse. A length of 60 feet was spread out on the ground and fired by means of the safety fuse at one end. On the fire reaching the instantaneous fuse, the combustion of its whole length immediately followed, scarcely any perceptible time, certainly not a second, being occupied. The fuse burns with a kind of explosion, but with very little violence.

Renewing Burnt Steel.

It is generally believed that steel, when once burnt, is absolutely unfit for any purpose whatever, and it seems a difficult matter to convince people that such is not the case. Messrs. Bauer & Co., of New York city, have for some time been engaged in accumulating proofs to the contrary, and show that with the aid of "steeline," a compound which they prepare, burnt steel may be restored, and that, in fact, overheating of steel and subsequent cooling in steeline offers many advantages in working. We witnessed recently some experiments made with the compounds which prove its efficiency. One end of a steel bar was heated and tempered in the usual way, exhibiting a good fracture, the other end was then burnt, cooled in "steeline," an oily, semi-fluid mixture, heated again to a somewhat lower heat than usual, and then cooled in water. A fracture of the burnt steel showed the open granular fracture which would lead to its immediate condemnation, while the same burnt material, after treatment, had all the characteristics of a steel superior to the metal originally treated. We are assured by a firm whose reputation ranks among the highest in this country, that they found the steel work easier by its application, and that it is less liable to break in hardening. Messrs. Bauer & Co. have commenced an interesting series of experiments looking to the use of ordinary Bessemer rail steel for cutlery, saws, files, etc., by a treatment with "steeline." They have succeeded thus far in obtaining creditable results, having made files, saws and knives which rank well. From better qualities of steel they show excellent specimens of springs, so that the results thus far are very encouraging, and may be considered as strong proofs of the correctness of their method of manipulating steel, strongly at variance as it may appear with accepted notions. —*Iron Age.*

ARTIFICIAL FORMATION OF FELDSPARS.—F. Fouque and A. Mitchel Levy have recently prepared the minerals above mentioned. Nepheline is formed when a mixture of silicic acid, alumina and sodium carbonate, in such proportions that the oxygen of protoxide, sesquioxide and acid are as 1: 3: 4, are heated together; white silk-like crystals are obtained, which, under the microscope, are seen to be small hexagonal prisms (they are 0-12 min. long and 0-06 min. broad), which accord in every respect with natural crystals of nepheline. If somewhat more silicic acid be taken, like that corresponding to the proportion 1: 3: 4½, a completely crystalline mass is obtained, which bears in its optical characters the same resemblance to hexagonal nepheline as chalcedony does to quartz. By melting together one-tenth pyroxene and nine-tenths nepheline a mixture of four different minerals was obtained: nepheline, pale green spinel, garnet in brown-yellow octahedra, and microlite. Leucite was also found in the fused product, and resembled both in form and optical characters the natural mineral.—*Comptes Rendus.*

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Nov. 20.		Week Ending Nov. 26.		Week Ending Dec. 4.		Week Ending Dec. 11.	
Alpha	13¼	11¾	12	9¼	10	8¼	8¼	7⅜
Alta	5	4	4.55	3¾	4	3¼	3.45	2.90
Andes	1.16	1	1.10	1	1	65c	70c	55c
Alps	....	....	....	....	....	....	....	....
Argenta	1	90c	95c	80c	95c	85c	1	90c
Atlantic	....	....	15c	....	10c	5c	5c	....
Aurora Tunnel	....	....	15c	....	....	....	....	....
Baltimore Con	....	....	....	....	....	....	....	....
Belcher	3.95	3.05	3.20	2¾	2.95	2	2	1.40
Belmont	1	90c	1	90c	1	80c	1.45	90c
Best & Belcher	20	17¾	13¾	16¼	18¼	14	13¾	10⅝
Bullion	6¼	5¼	5¾	4¾	5¼	4.20	4.65	3.45
Bechtel	1.90	1¾	1¾	1½	1¾	1½	1¼	1.40
Belle Isle	4.40	3½	3.30	2	2.65	1.85	1¾	1.40
Bodie	13⅛	12¼	12⅝	10¼	10⅛	9½	9	8¾
Bonton	3.60	3	3.10	2.60	2.80	2.15	2	1.10
Bulwer	11	10⅛	10¼	9¾	10	9¾	10	9¼
Boyle	....	....	....	....	....	....	....	....
Black Hawk	70c	50c	50c	....	25c	20c	40c	20c
Belvidere	75c	70c	50c	....	60c	45c	1	60c
Booker	1.05	95c	85c	75c	85c	75c	70c	55c
Caledonia	1.95	1½	1½	1¼	1¼	1.05	1.10	50c
California	5¼	4¾	5	4.65	4¾	3.70	3.85	3¼
Challenge	2¾	2¾	2.60	2.20	2.20	1.80	1.80	1⅝
Chollar	7¾	6⅝	8	7	8	7	6⅝	5¾
Confidence	11	9⅝	10½	9	9½	7	7	6¾
Con Imperial	90c	75c	80c	65c	70c	55c	60c	50c
Con Virginia	5½	5⅜	5¼	5	6¼	4¼	4.95	3¾
Crown Point	3.90	3	3.05	2½	2.60	2	1.80	1¼
Con Washoe	....	....	....	....	....	....	....	....
Champion	40c	15c	30c	25c	30c	25c	30c	20c
Concordia	....	....	....	....	40c	20c	25c	15c
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	1¼	1.10	1.20	1.10	1.10	1	1.10	70c
Eureka Con	26	19¾	17⅝	16¼	19	16½	24½	17¾
Exchequer	4.60	4	4.30	3¾	4	3.40	3.40	2.60
Endowment	90c	75c	80c	60c	75c	70c	80c	75c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	2¼	2	1.95	1¾	1	25c	1	70c
Gila	40c	30c	40c	30c	35c	20c	25c	20c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	13	12½	....	....	13	12½	12½	12
Goodshaw	40c	35c	35c	25c	20c	15c	20c	5c
Gould & Curry	10½	9¼	9¾	8	8½	7½	7	5¼
Hale & Norcross	18	13¾	14¾	13	14½	11	9⅝	7⅛
Hillside	1¾	1.70	1.40	80c	1.10	1	1.10	1
Highbridge	....	....	....	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	20c	10c	20c	....	....	....	....	....
Independence	1.35	90c	80c	75c	80c	70c	60c	40c
Julia	3.15	2½	2.35	1.80	1.95	1.20	1½	80c
Justice	2¾	2.40	2½	2	2.35	1.60	1.80	1¼
Jackson	4	3½	....	....	....	....	3½	....
Joe Scoates	....	....	....	....	....	....	....	....
K K Con	3¼	....	4	....	4	3½	4½	4
Kentuck	3.90	....	3¾	3½	3½	3	3	2.60
Kossuth	20c	....	20c	15c	15c	....	....	....
Keystone	3.65	3.60	3½	....	....	....	....	....
Lady Bryan	50c	25c	40c	35c	50c	25c	40c	25c
Lady Wash	1.05	90c	90c	75c	80c	50c	70c	50c
Leopard	45c	25c	25c	20c	25c	....	15c	5c
Leviathan	50c	40c	40c	25c	30c	25c	30c	20c
Leeds	50c	....	50c	40c	60c	40c	40c	...
Lee	....	....	....	....	....	....	....	....
May Belle	35c	25c	25c	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	2.60	2¼	2½	2.10	2	....	1¾	....
Martin White	1¼	1.20	1¼	1.10	1	80c	1⅜	85c
McClinton	75c	60c	50c	40c	45c	40c	40c	35c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	33	26	29	23½	24¼	20	22½	18
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	5	....	....	....	....	....
North Con Virginia	....	....	10¼	10	10¼	....	....	....
New York	30c	20c	50c	20c	45c	30c	35c	30c
Northern Belle	6½	6	6⅝	6½	6¼	6	6¼	6⅛
New Coso	....	....	....	....	....	....	....	....
Navajo	60c	45c	50c	35c	30c	25c	30c	25c
Occidental	2.15	2	1¼	1	2	1¼	1¼	85c
Ophir	31½	26½	30	26	26¾	22½	25	21
Oriental	25c	10c	15c	5c	....	....	35c	5c
Overman	8⅜	8	8¼	6⅝	7	5⅜	5⅜	4¼
Panther	....	....	....	....	....	....	....	....
Pheuix	....	....	....	....	....	....	....	....
Phil Sheridan	35c	30c	25c	20c	25c	20c	25c	20c
Potosi	5⅝	4⅜	4.90	4¼	4.55	3.60	4.05	2.60
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	1.40	1.20	1.10	1	1	....	1	50c
Richer	....	....	....	....	5	....	....	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	15	12½	11¾	9¾	10¼	7¾	8	6¾
Seg Belcher	15	13	15	12	16	15	13½	13
Sierra Nevada	53	44½	45	37½	39¾	39	34½	24½
Silver Hill	1.60	65c	1½	1¼	1.35	1	1	65c
Silver King	6	5½	....	....	5	4	5½	4
Silver Prize	....	....	....	....	....	....	....	....
Succor	30c	....	....	....	20c	....	....	....
Summit	1.70	1¼	1.20	90c	1.10	80c	90c	60c
Scorpion	4½	3.80	3.85	2½	3.10	1.95	3¼	2½
Solid Silver	30c	....	....	....	35c	....	35c	....
South Bodie	25c	20c	30c	20c	25c	15c	15c	10c
South Standard	....	....	15c	....	....	....	25c	....
Star	35c	30c	35c	25c	25c	20c	20c	15c
St. Louis	....	....	....	....	....	....	....	....
Syndicate	5¾	3.90	3.10	2.90	3	2	3¼	2.20
Tioga Con	3	2¾	2¼	2	2¼	2	2	1.65
Tiptop	1.95	1½	1.60	1½	1¾	1.65	1.90	1.70
Trojan	10c	....	10c	....	10c	5c	5c	....
Union Con	66½	52½	60	43¾	61	45¾	57½	44¾
Utah	18¾	16	17¾	14¾	16	14	13½	10
Vermont Con	....	....	....	....	....	....	....	....
Ward	2.10	1⅝	1.90	1.35	1½	1.20	1.30	1
Wells-Fargo	10c	5c	5c	....	5c	....	....	....
Woodville	30c	25c	25c	20c	20c	15c	15c	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	16½	14¾	15⅝	13	13¾	11¾	10½	8⅝

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Addenda G & S M Co	California	2	20	Dec 10	Jan 14	Feb 3	T H Dixon	238 Montgomery st
Alpha Con M Co	Nevada	11	1 00	Nov 26	Dec 30	Jan 20	Wm Willis	309 Montgomery st
Aurora Tunnel & M Co	California	4	10	Nov 13	Dec 16	Jan 3	C V Hubbard	203 Bush st
Belcher S M Co	Nevada	20	1 00	Nov 17	Dec 23	Jan 13	Jno Crockett	203 Bush st
Best & Belcher M Co	Nevada	16	1 00	Nov 5	Dec 29	Jan 19	Wm Willis	309 Montgomery st
Black Hawk G M Co	California	7	25	Nov 14	Dec 18	Jan 7	H A Charles	419 California st
Caledonia S M Co	Nevada	29	50	Nov 10	Dec 16	Jan 6	R Wegener	414 California st
Con. Imperial M Co	Nevada	10	20	Dec 10	Jan 14	Feb 4	W E Dean	203 Bush st
Curtis Con M Co	Nevada	2	05	Nov 21	Dec 24	Jan 12	H S Stone	419 California st
Crown Point G & S M Co	Nevada	39	1 00	Nov 17	Dec 22	Jan 12	Jas Newlands	203 Bush st
Defiance G M Co	California	4	30	Nov 12	Dec 17	Jan 6	W H Lent	309 Montgomery st
Dudley M Co	California	6	25	Nov 19	Dec 20	Jan 16	E C Masten	309 Montgomery st
Flowery M Co	Nevada	3	25	Nov 14	Dec 19	Jan 7	W W Stetson	309 Montgomery st
Gen'l Thomas M & M Co	Nevada	5	25	Nov 3	Dec 8	Dec 29	Wm Willis	309 Montgomery st
Grand Prize M Co	Nevada	3	75	Nov 25	Dec 30	Jan 20	E M Hall	327 Pine st
Hillside M & M Co	Nevada	1	50	Nov 21	Dec 24	Jan 13	F Frankenthal	330 Pine st
Independence M Co	Nevada	4	25	Nov 15	Dec 18	Jan 8	E M Hall	327 Pine st
Indian Queen M & M Co	Nevada	2	10	Nov 6	Dec 20	Jan 10	A K Durbrow	309 Montgomery st
Julia Con M Co	Nevada	10	1 00	Nov 19	Dec 24	Jan 16	H A Charles	419 California st
Jupiter M Co	California	6	35	Nov 12	Dec 15	Jan 8	E C Masten	309 Montgomery st
Justice M Co	Nevada	30	50	Nov 29	Jan 3	Jan 24	R E Kelly	419 California st
Mammoth M Co	California	3	1 00	Dec 5	Jan 15	Feb 13	A W Field	302 Montgomery st
Martin White M Co	Nevada	5	60	Dec 10	Jan 12	Feb 3	J J Scoville	309 Montgomery st
McCrackin Con M Co	Arizona	4	25	Nov 17	Dec 24	Jan 20	A Wenzelburger	216 Sansome st
Mexican G & S M Co	Nevada	9	2 00	Nov 7	Dec 11	Dec 31	C L McCoy	203 Bush st
New York M Co	Nevada	20	30	Oct 22	Nov 24	Dec 16	D L Thomas	203 Bush st
North Bonanza M Co	Nevada	4	25	Nov 21	Dec 26	Jan 15	W W Stetson	309 Montgomery st
Northern Belle Isle M Co	Nevada	1	10	Nov 8	Dec 11	Dec 31	E M Hall	327 Pine st
Occidental Con G M Co	California	3	10	Nov 10	Dec 20	Jan 10	W T Smith	402 Montgomery st
Oriental Con G & S M Co	California	5	25	Nov 8	Dec 10	Dec 27	H C Hinman	411 California st
Overman S M Co	Nevada	44	2 00	Nov 25	Dec 31	Jan 21	Geo D Edwards	414 California st
Potosi M Co	Nevada	2	50	Nov 4	Dec 9	Dec 30	W E Dean	203 Bush st
Real del Monte M Co	Nevada	9	25	Dec 1	Jan 3	Jan 24	C V D Hubbard	203 Bush st
Savage M Co	Nevada	40	1 10	Nov 9	Jan 2	Jan 22	E B Holmes	309 Montgomery st
Seg Belcher M Co	Nevada	15	3 00	Oct 31	Dec 5	Dec 26	Geo D Edwards	414 California st
Sierra Nevada S M Co	Nevada	60	2 00	Oct 31	Dec 4	Dec 24	W W Stetson	309 Montgomery st
Tioga Con M Co	California	8	20	Nov 26	Dec 31	Jan 21	W H Lent	309 Montgomery st
Utah S M Co	Nevada	27	2 00	Oct 22	Nov 25	Dec 13	G C Pratt	309 Montgomery st
Wells Fargo M Co	Nevada	13	10	Nov 17	Dec 22	Jan 9	D L Thomas	10 Leidesdorff st
Yellow Jacket S M Co	Nevada	24	1 00	Oct 13	Nov 18	Dec 18	Mercer Otey	Gold Hill, Nevada
Ward G & S M Co	Nevada	5	40	Dec 10	Jan 16	Feb 5	Jacob Stadtfeld	419 California st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Aurora M Co	California	1	10	Dec 3	Jan 3	Jan 18	P Conklin	28 Sansome st
Alpha Hydraulic Grav M Co	California	1	20	Oct 2	Nov 10	Dec 13	James Ireland	215 Sansome st
Butte Hydraulic M Co	California	—	10 00	Oct 31	Dec 2	Dec 22	L L Dennery	220 Sansome st
Cataract & Wide West H M Co	Cal	—	25	Nov 15	Dec 22	Jan 12	Wm B Lake	26½ Kearny st
Chollar M Co	Nevada	—	50	Nov 4	Dec 9	Dec 29	W E Dean	203 Bush st
Diana G & S M Co	Nevada	4	10	Sept 24	Nov 17	Dec 15	J T McGeoghan	318 Pine st
Eagle G & S M Co	California	1	10	Dec 6	Jan 6	Jan 22	F W Utter	112 Leidesdorff st
Florida Hill M Co	Idaho	1	10	Oct 31	Dec 5	Dec 30	R Wegener	414 California st
Hazard Grav M Co	California	4	03	Dec 2	Jan 5	Jan 25	J T McGeoghehan	318 Pine st
Headlight M Co	California	1	15	Dec 4	Jan 17	Feb 12	A W Field	302 Montgomery st
Monte Cristo Con M Co	California	1	10	Oct 3	Nov 17	Dec 15	Butler Burris	309 Montgomery st
Morgan M Co	California	5	30	Nov 13	Dec 23	Jan 15	J J Raphael	533 Kearny st
Northern Light G & S M Co	Cal	5	10	Nov 5	Dec 8	Dec 26	F S Monroe	310 Pine st
Numa M Co	Nevada	2	02	Oct 23	Dec 22	Jan 12	D Wilder	328 Montgomery st
Quartz Mountain G M Co	California	8	50	Dec 1	Jan 5	Jan 26	E Hestres	729 Montgomery st
Quinn M Co	California	—	25	Nov 15	Dec 19	Jan 7	T J Blakeney	Palace Hotel
Revenue M Co	Nevada	1	50	Nov 26	Dec 29	Jan 23	A J Bunner	411½ California st
San Xavier M & S Co	Arizona	1	25	Oct 14	Dec 1	Dec 22	F A McGee	32 Merchants' Ex
South Bulwer G M Co	California	5	25	Oct 27	Nov 29	Dec 20	W Stuart	320 Sansome st
Summit G M Co	California	4	30	Nov 17	Dec 22	Jan 12	W H Lent	309 Montgomery st
Telfair M Co	Arizona	1	02	Nov 12	Dec 20	Jan 15	J Pentecost	702 Market st
Tellurium G & S M Co	California	20	10	Dec 3	Jan 7	Jan 29	J M Litchfield	415 Montgomery st
University G M Co	California	4	15	Nov 10	Dec 13	Jan 3	W L Oliver	328 Montgomery st
Wide Awake P & M Co	Arizona	8	03	Oct 11	Nov 11	Dec 11	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
El Tesoro S M Co	Arizona	W H Chickering	214 Sansome st	Stockholders	Dec 15
Gould & Curry S M Co	Nevada	A K Durbrow	309 Montgomery st	Annual	Dec 15
Leopard M Co	California	E M Hall	327 Pine st	Annual	Dec 29
Last Chance M Co	—	T A White	113 Leidesdorff st	Stockholders	Dec 19
Ophir S M Co	Nevada	C L McCoy	203 Bush st	Annual	Dec 17

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Belle Isle M Co	Nevada	R H Brown	S F Stock Ex	75	Nov 5
Bodie Con M Co	California	W H Lent	Nevada Block	50	Dec 1
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	2 00	Oct 20
Ophir S M Co	Nevada	C L McCoy	203 Bush st	1 00	Dec 12
Pioneer M Co	California	J W Pew	310 Pine st	08	Oct 6
Standard Con M Co	California	Wm Willis	309 Montgomery st	60	Dec 12

Sales at S. F. Stock Exchange.

Friday A. M., Dec. 5.

60 Alpha........8¼
780 Alta........3.10@2.95
450 Andes........55@60c
450 Best & Belcher..12½@12⅝
335 Bullion........4.65@4.60
410 Belcher........2@1.90
1365 Benton........1½@1.10
65 Confidence........6
615 California........3.80@3¾
1315 Con Virginia........3.95@4
640 Chollar........6¾@5⅝
985 Con Imperial........55@60c
715 Challenge........1.80@1¾
425 Caledonia........1.05@1
605 Crown Point...1.70@1.60
680 C Dorado........1
860 Exchequer........3.10@3
215 Flowery........25c
255 Golden Gate........2
620 Gould & Curry........6¾@6½
1365 Hale & Nor........9⅝@9
400 Justice........1.70@1.60
445 Julia........1½@1¼
100 Kentuck........2¾
125 Lady Bryan........25c
275 Lady Wash........60c
250 Leviathan........25c
585 Mexican........21@20½
450 Mountain View....2¾@2½
1400 Mackey........10c
130 N Bonanza........60c
700 New York........35c
20 Occidental........1¼
715 Ophir........23½@24½
55 Overman........6¾
650 Potosi........4.05@4
10 Seg Belcher........13
365 Sierra Nevada....34@34½
440 Savage........7¾@8
585 Silver Hill........95c@1
250 Scorpion........2.80@2¾
1000 S Utah........10@5c
925 Union Con........53@52½
375 Utah........13@12½
380 Ward........1¼
200 Woodville........15c
665 Yellow Jacket........10@9½

AFTERNOON SESSION.

900 Albion........20@25c
750 Adenda........50@55c
740 Argenta........90c
270 Belle Isle........1.40@1½
500 Belmont........1.05@1¼
350 Bodie........8¾@9
865 Bechtel........1½
790 Belvidere........75@60c
50 Bulwer........9¾
850 Black Hawk........20@25c
300 Booker........70@55c
10 Boston........1.40
150 Concordia........20@25c
550 Champion........20c
100 Dudley........50c
1770 Day........1.10@90c
190 Eureka Con........18@17¾
700 Endowment........80c
100 Gila........25c
340 Grand Prize........70@75c
100 Goodshaw........15c
200 Golden Terra........12½
200 Giant & O A........5½
500 Hillside........1.10@1.15
800 Independence........50@60c
820 Jupiter........1
600 Leeds........40c
490 Martin White....90@85c
230 Mono........4
530 McClinton........40c
65 Mt Diablo........11¼
50 Mammoth........5½
450 Northern Belle........6½
175 Noonday........3
450 Navajo........25c
135 N Noonday........2½
200 Queen Bee........35c
620 Ray'd & Ely........60@50c
300 Real del Monte........1¾
695 S Bulwer........50c
400 Star........15c
695 Syndicate........2.30@2.20
100 S Bodie........15c
30 Summit........70c
100 Silver King........4
600 Tiptop........1¾@1.70
490 Tioga Con........2
1100 University........5@10c

Saturday A. M., Dec. 6.

365 Alpha........8¼@8
245 Alta........3@3¼
420 Andes........65@70c
1100 Atlantic........5c
370 Argenta........90c
300 Albion........25c
590 Best & Belcher...13@13¼
600 Bullion........4.65@4.60
365 Belcher........1.70
760 Benton........2
300 Belmont........1.05
150 Bulwer........10@9¾
210 Belle Isle........1.55@1.60
850 Belvidere........90@95c
100 Booker........60c
320 Bechtel........1¼
25 Bodie........8⅝
500 Black Hawk........40c
400 Boston........1¼@1.40
175 Chollar........6⅝
1270 Con Virginia........3.90@3¾
1040 California........3.70@3¾
465 Caledonia........90c@1
1930 Con Imperial........60@50c
525 Crown Point...1.80@1.70
255 Confidence........6
465 Challenge........1.80@1¾
3000 Con Dorado...1.40@1.30
150 Champion........30c
20 C Pacific........5¾
100 Concordia........25c
765 Day........95@85c
300 Dardanelles........80c
310 Exchequer........3.35@3.40
75 Eureka Con........19
800 Endowment........80c
620 Flowery........25@20c
565 Gould & Curry........6¾@7
120 Golden Gate........2
330 Gila........25c
330 Grand Prize........75@90c
300 Goodshaw........10c
1150 H & Norcross........8¾@8⅝
50 Hillside........1.10
600 Justice........1¾@1.80
200 Jupiter........1¼
840 Julia........1.30@1.40
80 Kentuck........2.90
550 Lady Bryan........35@30c
100 Leviathan........30c
895 Lady Wash........70@60c
100 Leopard........5c
540 Mexican........21¼@21½
2600 Mackey........10c
320 Mount View........1½@1¾
400 McClintou........40@35c
145 Mt Diablo........11
60 Mono........4.10
50 Mammoth........5½
300 M White........75c
830 New York........30c
60 Northern Belle....6¾@6½
610 N Bonanza........50@75c
253 N Belle Is........30c
120 Noonday........3.10
200 N Noonday........3
560 Ophir........25@24½
155 Overman........5⅜@5½
440 Occidental........1@90c
960 Oriental........5c
175 Potosi........3.85@3.80
330 Phil Sheridan........20c
480 Raymond & E....60@55c
200 Real Del Monte........1¾
530 Savage........7½@7⅝
905 Silver Hill........1
10 Seg Belcher........13
530 Sierra Nevada........33@34
300 Scorpion........3¼
500 Solid Silver........35c
45 Summit........75c
340 S Bulwer........50@55c
300 South Standard........25c
115 Silver King........5½
195 Tioga........2
650 Tiptop........1¾@1.90
205 Utah........13¾
785 Union Con........56@57½
200 University........10c
150 Woodville........15c
975 Ward........1¼@1.30
525 Wales........3¼@3.20
855 Yellow Jacket........10@9

Monday A. M., Dec. 8.

500 Alta........3@2.90
140 Alpha........7½@8
610 Andes........50@70c
1100 Atlantic........5c
340 Best & Belcher...12¾@12½
375 Belcher........1¾@1.80
1670 Bullion........4¼@3½
530 Benton........1¾@1.90
640 California........3.85@3¾
360 Chollar........6½
1910 Con Virginia....4¼@4.95
395 Crown Point....1¼@1.60
90 Confidence........6¼@6½
450 Con Imperial....60@55c
300 Caledonia........75@85c
90 Challenge........1.65@1¾
1300 C Dorado........1.40@1½
150 Dardanelles........80c
530 Exchequer........2¾@2.60
300 Flowery........15c
680 Gould & Curry........6½@6
5200 Golden Gate........1¼@1¼
795 Hale & Nor........8¼@8
135 Justice........1.65@1⅝
680 Julia........1@1.10
45 Kentuck........2.60
150 Leviathan........25c
145 Lady Bryan........30@40c
685 Lady Wash........55@60c
1200 Mexican........21@22½
400 Mackey........10c
150 Mt View........1½@1.55
200 North Carson........10c
170 New York........35@30c
200 N Bonanza........50@55c
755 Ophir........23½@22½
320 Overman........4½@5
370 Occidental........85c
50 Phil Sheridan........20c
1635 Potosi........2.60
650 Savage........7@6½
205 Silver Hill........90@60c
1775 Sierra Nevada...30½@28½
315 Scorpion........3@2.90
1470 Union Con........50@47½
130 Utah........11½@11
250 Ward........1
300 Woodville........15c
335 Yellow Jacket........9½

AFTERNOON SESSION.

800 Argenta........90@95c
700 Albion........30@25c
1100 Adenda........55@60c
590 Bechtel........1½
545 Bodie........9
1580 Belvidere........95c@1
210 Booker........60c
100 Belmont........1.45
465 Belle Isle........1.60@1.65
1000 Champion........20c
110 C Pacific........5¼@4½
290 Caledonia (B H)........3.70
1950 Day........80@90c
100 Dudley........50c
430 Eureka Con........22@24½
3800 Endowment........80@75c
760 Gila........20@25c
475 Grand Prize........90c@1
1500 Goodshaw........15@20c
210 Golden Terra........12½
400 Independence........55c
100 Jupitor........1
400 K K Con........4
400 Leopard........10c
200 Leeds........40c
50 Metallic........70c
30 Mt Diablo........10½
50 McClintou........40c
150 Mono........4¼@4.05
615 M White........1¾
240 Northern Belle....6¼@6½
600 Navajo........25c
1750 N Belle Is........30@25c
135 Noonday........3½@4
400 Oriental........5c
1000 Oro........20c
150 Paradise........75c
250 Queen Bee........35@45c
820 Raymond & E........95c@1
100 Summit........90c
550 S Bodie........15@10c
200 S Bulwer........55c
30 Silver King........4
345 Syndicate........3¼@3.15
255 Tioga Con........2@1.90
230 Tiptop........1¾@1.90
400 University........10@5c
290 Wales........3¼

Tuesday A. M., Dec. 9.

330 Alta........3
70 Alpha........7½@7⅜
550 Atlantic........5c
280 Andes........60@70c
625 Bullion........3.45@3⅜
760 Belcher........1⅝@1.45
435 Best & Belcher...11¾@11⅝
585 Benton........1⅝@1.70
150 California........3.70
570 Con Virginia........4@4.05
80 Chollar........5¾
205 Confidence........5½@5¾
430 Con Imperial....50@55c
275 Crown Point....1¼@1.30
525 Caledonia........60@70c
350 Con Dorado........1.40
400 Challenge........1½
200 Dardanelles........80c
325 Exchequer........2¾@2.70
1000 Flowery........10c
185 Gould & Curry........6@5¾
600 Golden Gate.....1.20@1¼
665 H & Norcross........7½@7¼
60 Justice........1¼
1100 Julia........1@1.05
2965 Lady Wash........55@50c
750 L Bryan........30c
50 Leviathan........20c
995 Mexican........19@18½
1800 Mackey........10c
400 Mt View........1½@1¾
600 N Bonanza........50c
650 New York........30c
300 Ophir........22@21½
200 Overman........4¾@4.70
100 Occidental........90c@1
150 Phil Sheridan........20c
515 Potosi........3.10@3.20
380 Scorpion........2.60@2.60
1045 Savage........6½@6½
1640 Sierra Nevada...26½@24½
520 Silver Hill........75@65c
1200 Trojan........5c
245 Utah........10@10½
2070 Union Con........45@47
600 Ward........1.10
690 Yellow Jacket........9@8¾

AFTERNOON SESSION.

880 Argenta........95@90c
450 Albion........30@35c
400 Belmont........90@95c
380 Bodie........8¾@9
275 Bechtel........1.40@1½
305 Belle Isle........1.70@1.55
740 Booker........65@70c
20 Bulwer........9¼
250 Belvidere........90c
250 Black Hawk........35c
1800 Champion........25@20c
300 Concordia........25c
1465 Day........70c
100 Eureka Con........21@20½
550 Endowment........75c
600 Gila........20@25c
450 Grand Prize........80@75c
100 Hillside........1.10
90 Independence....50@40c
5000 Indian Queen........25c
480 Leopard........15c
100 Manhattan........1¾
10 Mt Diablo........10½
400 McClinton........40c
100 Mono........3¾
100 Mammoth........3¼
550 Navajo........30@25c
150 Oriental........35c
250 Paradise........75c
50 Queen Bee........40c
400 Raymond & Ely...90@65c
200 Real del Monte..1¼@1.40
50 Star........20c
50 S Bodie........10c
20 Summit........60@70c
300 Syndicate........2.65@2¾
50 S Bulwer........55c
170 Tioga........1.90@1¾
335 Wales........3¼

Wed'sday, A.M., Dec. 10.

100 Andes........70c
55 Alpha........7½@7⅜
90 Alta........3.35@3.45
770 Benton........1.55@1.60
555 Belcher........1½
635 Bullion........3.80@3¾
390 Best & Belcher..10⅝@10⅜
595 California........3½
220 Con Virginia........3.90
310 Chollar........5⅜@5½
900 Con Imperial....50@55c
825 Crown Point....1¼@1.30
375 Challenge........1½
1015 Caledonia........50c
200 C Dorado........1.35
305 Confidence........5½@6
100 Dardanelles........80c
405 Exchequer........2¾@2.70
400 Flowery........10c
545 Gould & Curry....5½@5¾
300 Golden Gate....1.15@1⅛
960 Hale & Nor........7½@7½
530 Justice........1¼@1½
925 Julia........80c@1
330 Kentuck........3@2¾
405 L Bryan........35@25c
840 Lady Wash........50c
450 Mexican........18@18¼
1700 Mackey........10c
150 Mountain View..1½@1.60
300 N Bonanza........40@35c
400 New York........30c
230 Ophir........21
50 Occidental........90c
165 Overman........4⅜@4.50
200 Phil Sheridan........20c
360 Potosi........3@3.05
915 Silver Hill........70@65c
885 Scorpion........2.60@2½
745 Savage........6½@6⅝
20 Seg Belcher....13¼@13½
1030 Sierra Nevada....25½@25¾
1300 Trojan........5c
135 Utah........10¾@11½
1460 Union Con........46½@44¾
800 Ward........1.10@1.30
295 Yellow Jacket....9¼@9⅝

AFTERNOON SESSION.

2350 Argenta........90c@1
350 Albion........35@40c
1380 Adenda........40@35c
1500 Atlas........15c
405 Bodie........8¾@8½
300 Bechtel........1.40
180 Belle Isle........1⅝
350 Booker........60@55c
800 Belmont........95c@1
150 Boston........1.40@1⅝
400 Black Hawk........30@35c
900 Belvidere........95c@1
250 Champion........25c
225 Concordia........15c
200 Caledonia (B H)........3.40
10 Con Pacific........5
950 Day........70@75c
160 Dudley........50c
400 Endowment........75c
100 Eureka Con........19
550 Goodshaw........5c
50 Golden Terra........12
110 Grand Prize........80@75c
200 Gila........20c
1670 Hillside........1.05@1
330 Independence........40c
675 Jupiter........1
25 Jackson........3½
400 K K Con........4¼
200 Leopard........15c
290 McClinton........35c
325 M White........85@90c
120 Mono........4@3¾
200 Mammoth........3.30
550 Navajo........30c
150 Northern Belle........6¼
285 Noonday........4@3.80
50 Oriental........30c
550 Oro........20c
300 Paradise........70c
200 Queen Bee........35c
60 Raymond & E........60c
410 Real del Monte..1½@1.40
65 Star........20c
150 Summit........65@70c
200 S Bulwer........55c
230 Silver King........4½
30 Syndicate........2¼
100 S Bodie........15c
360 Tiptop........1¾
125 Tioga Con........1.65@1¾
300 University........5c
325 Wales........3¼@3

SALES OF LAST WEEK AND THIS COMPARED

Thursd'y A. M., Dec. 4.

415 Andes........65c
405 Alta........3.40@3¼
120 Alpha........8½
1200 Atlantic........5c
260 B & Belcher........14½@14
490 Belcher........2.20@2¼
575 Bullion........5@4.35
440 Benton........2.30@2.15
50 C Dorado........1½
780 Chollar........7
595 Crown Point........2
1820 Con Imperial....65@70c
940 California......3.80@3.70
380 Con Virginia....4¼@4.30
110 Confidence........7½
415 Caledonia.....1.15@1.10
200 Challenge........2
650 Exchequer.....3.60@3.40
400 Flowery........25c
450 Gould & Curry.....7¾@7½
280 Golden Gate........2
390 Hale & Nor........11@11½
40 Justice........1.80
620 Julia........1.70@1.65
190 Kentuck........3.10@3¼
200 Lady Bryan........40c
325 Lady Wash........75@70c
100 Leviathan........25c
885 Mexican........22@21¾
2250 Mackey........10c
450 Mt View........2.85@2.70
300 N Bonanza........70c
50 New York........35c
200 North Carson........10c
50 North Con Vir........10¼
310 Ophir........25@24½
300 Overman........5¾@5⅝
20 Occidental........1¼
100 Potosi........3.90
100 Phil Sheridan........25c
415 Savage........8½
515 Sierra Nevada....37@36½
20 Seg Belcher........16@15
450 Silver Hill........1@1.10
520 Scorpion........3.10@3
600 Trojan........10c
85 Utah........15@15¼
1115 Union........64@56½
500 Ward........1.45
800 Wells-Fargo........5c
520 Yellow Jacket....12@11¾

AFTERNOON SESSION.

1210 Addenda........60@65c
300 Atlas........25c
600 Albion........20c
1410 Argenta........95@90c
130 Belmont........85@80c
50 Boston........1.40
450 Booker........60c
550 Black Hawk......25@30c
1295 Belvidere........1@1.15
120 Bodie........8¾@8½
675 Belle Isle........1.90@1¾
235 Bechtel........1½
650 Champion........25@20c
850 Caledonia (B H).3½@3.70
810 Day........1.10@1.05
755 Eureka Con........18
500 Endowment......85@80c
1200 Gila........20@25c
150 Grand Prize........70c
100 Goodshaw........15c
110 Hillside........1.10
110 Independence........65c
250 Jupiter........1¼
100 Metallic........80c
525 Martin White....70@80c
30 Mammoth........6½
260 Mono........4
510 McClinton........35@50c
10 Mt Diablo........12½
1450 N Belle Is........30c
850 Navajo........25c
255 Noonday.......3.60@3.30
660 Northern Belle.....6¼@6
100 Queen Bee........20c
100 Rough & Ready........40c
100 Real del Monte........2
140 Raymond & Ely........90c
300 S Bulwer........55c
400 Sta Mina........1.15
500 S Bodie........15c
35 Summit........80c
200 Star........20@15c
400 Syndicate......2.10@2.05
150 Tioga Con........2.10@2¼
245 Tiptop........1¾
280 University........5c
200 Wales........3.05@3

Thursday A.M., Dec. 11.

30 Alpha........8
495 Alta........3.20@3¼
160 Andes........70c
375 Best & Belcher........11¼
450 Bullion........4¼@4.05
1050 Belcher........1¼@1.40
300 Benton........1.70@1¾
335 California........3.70@3¾
820 Con Virginia.....4.10@4¼
280 Chollar........6⅜@6¼
785 Crown Point.....1.30@1¼
40 Confidence........7
1055 Caledonia........1.10@1
350 Con Dorado........1.35
150 Dardenelles........80c
245 Exchequer........3@2.95
100 Flowery........10c
490 Gould & Curry......6@5¾
850 Golden Gate........1.15
210 Hale & Nor........8½@8⅝
450 Julia........1
305 Justice........1.30
175 Kentuck........3
400 Lady Bryan........30c
200 Lady Wash........50c
200 Leviathan........30@25c
710 Mexican........19¾@20
2700 Mackey........10c
430 Mt View........1@1¼
550 New York........30c
425 N Bonanza........45@50c
265 Ophir........22@22½
210 Overman........4½@4¼
710 Potosi........3.50@3½
50 Phil Sheridan........25c
155 Savage........7@6¾
650 Sierra Nevada....28@28½
20 Seg Belcher........13
380 Silver Hill........80@90c
935 Scorpion........2.90@3
50 Senator........10c
185 Utah........12¼@12¾
820 Union Con........47½@48
190 Ward........1.15
120 Yellow Jacket...10¼@10½

AFTERNOON SESSION.

820 Argenta........1@1.05
650 Albion........45c
360 Addenda........50c
200 Altas........25c
140 Belvidere........95@90c
30 Belmont........1
250 Black Hawk........25c
100 Booker........55c
200 Bulwer........9@8½
110 Bodie........8¾@8¾
255 Belle Isle........1¾
610 Bechtel........1¼@1.15
75 Caledonia (B H).3.40@3½
250 Concordia........10c
60 C Pacific........4½
1720 Day........35@75c
75 Dudley........50c
60 Eureka Con........18@18¼
750 Endowment........75c
250 Golden Terra........10½
250 Goodshaw........15@10c
150 Grand Prize........75c
200 Gila........20c
505 Hillside........1.05@1.15
900 Independence...85c@1.10
125 Jupiter........1
20 Jackson........3¼
150 K K Con........4@3¾
905 Martin White......90c@1
90 Mt Diablo........11½@11¼
120 Mammoth........3¼
75 Mono........4
30 McClinton........35c
370 N Noonday........3
140 Noonday........3.90@3.95
300 Navajo........30c
95 Northern Belle...6¼@6¼
150 Oriental........35c
75 Paradise........70@75c
300 Real del Monte........1.40
120 Raymond & E........70c
100 Richer........5c
250 S Bulwer........55@50c
225 Syndicate........2½@2.55
110 Summit........60@50c
400 Star........20c
555 Tioga Con........1¾@1.80
705 Tiptop........1¾@2
1650 University........25@20c
200 Wales........3¼@3.15

California Board—Latest Sales.

Wed'sday A.M., Dec. 10.

55 Alta........2¾@2.95
1200 Atlas........13@15c
100 Andes........65c
1200 Ætna........2c
300 Atlantic........5c
60 Belcher........1¼
30 Best & Belcher...10¼@10½
40 Bullion........3.60@3.70
40 California........3½@3¼
40 Con Virginia........4.10
200 Con Imperial........50c
40 Crown Point........1¼
20 Chollar........5¼
100 Challenge........1.45
60 Caledonia........65@60c
150 Exchequer......2.60@2.65
200 E Sierra Nevada.50@47½c
40 Gould & Curry...5⅝@5.70
100 Goodshaw........15c
30 Hale & Nor........6¾@6⅝
240 Justice........1¼@1.35
100 Kossuth........15c
150 Leviathan........20@21c
40 Mexican........17¾@17⅝
210 Mackoy........10c
60 New York........32½c
20 Ophir........21¼@21½
55 Savage........6½@6
60 Sierra Nevada....24⅝@26
120 Silver Hill........70c
900 S Utah........3@4c
20 Union........45@45½
40 Utah........10@10¼
30 Wales........3¼
2300 W Comstock........15c
30 Yellow Jacket....8¾@8⅝

AFTERNOON SESSION.

40 Alpha........7⅞
80 Alta........3@3.10
150 Andes........87½c
220 Argenta........95c
500 Atlantic........4c
600 Atlas........19@15c
2000 Ætna........2@3c
130 Belcher........1½
60 Best & Belcher..10½@10⅝
100 Benton........1.60
60 Bullion........3.90@3⅞
100 Big Prize........25c
1400 Black Hawk......35@40c
145 California.....3.60@3.65
75 Con Virginia........4
300 Con Imperial....50@52½c
30 Crown Point........1.30
20 Chollar........5¼
120 Caledonia........55@60c
70 Exchequer........2¾
300 Enterprise........1¼
40 Gould & Curry.....6¾@5¾
60 Hale & Nor........7¾@7⅞
300 Julia........95@97½c
140 Justice........1.35
40 Mexican........18⅞@19⅛
100 New York........31c
20 Ophir........22@21⅞
40 Potosi........3.20@3¼
20 Savage........6¼@7
30 Sierra Nevada....26½@26
150 Silver Hill........70c
400 S Utah........4c
100 Trojan........6c
60 Union Con........46½@46
20 Utah........11
70 Yellow Jacket.....9⅝@9

Pacific Board—Latest Sales.

Wed'sday A. M., Dec. 10.			
10 Alta	2.90	20 Utah	10¼
470 Best & Belcher	10⅝@10¾	10 Yellow Jacket	8⅛@9
135 Bullion	3.70	AFTERNOON SESSION.	
20 Belcher	1¼	70 Alta	3
100 Chollar	5½	100 Andes	70c
100 California	3.60	120 Best & Belcher	10⅝@11
2110 Con Imperial	52c@50c	180 Bullion	3.30@4
350 Caledonia	60c	40 Crown Point	1.35
210 Con Virginia	4@3.90	140 Con Imperial	51c@53c
430 Colorado	2⅛@2¼	10 Chollar	6¼
450 Crown Point	1.2.@1.35	5 Con Virginia	4
100 Exchequer	2¾	50 Caledonia	65c@70c
100 Gould & Curry	5⅞@5¾	100 Exchequer	2¾
200 Hale & Nor	6¼@7	25 Gould & Curry	6@5.80
50 Julia	90c@1	60 Hale & Nor	8
200 Lady Wash	55c	60 Justice	1⅛@1.40
155 Mexican	18⅛@17½	150 Julia	95c@1
100 N Bonanza	50c	10 Mexican	19
180 Ophir	21⅛@21¼	30 Overman	4⅛@4.70
100 Overman	4.20	120 Ophir	21¼
60 Potosi	2.90@3.10	300 Rough & Ready	15c
130 Savage	6⅛@6⅞	20 Savage	7
50 Scorpion	2.65	90 Scorpion	2¼
360 S Nevada	24⅛@25¼	100 Silver Hill	75c
100 Silver Hill	68c	40 Sierra Nevada	26⅛@27¼
120 Union	45	700 Trojan	5c
		300 Wells-Fargo	3c

Mining Share Market.

During the past week the condition of the mining share market has been of an ordinary character. The fluctuations have been of so little moment as to preclude any speculation. The market on this coast will undoubtedly remain in its present weak or rather vacillating condition until the newly-elected Legislature has indicated the direction of its acts towards carrying out the provisions of the new Constitution. The long-continued lull and marked inanition of the mining share business has not been without good results. It has enabled recuperation on the part of those upon whom the fever of speculation had set its seal, and it has developed the stronger and more reliable investments from the weaker. As week after week passes, with very nearly the same results as to condition, the sifting, gleaning operation of dullness has been more apparent. Appearances are strong that there will not be any reaction in the market towards a heavy rise. Strikes and rumors of strikes have very little effect, and the general lack of enthusiasm is more than manifest from the few small spurts of the past week.

San Francisco Microscopical Society.

The regular meeting of the San Francisco Microscopical Society was held Thursday evening, December 4th, 1879, an unusual number of members present. The business commenced early, with Vice-President Kinne in the chair. Professor Joseph Le Conte was elected corresponding member, and F. A. Holman, M. D., was proposed for a similar membership of the Faculty. Henry G. Hanks, the first President of the society, was readmitted a resident member, without the usual initiation fee required of new members.

After a brief discussion, it was voted to hold the annual reception of the society on the 19th inst., at Mercantile Library Hall; and Messrs. Hyde, Hanks and Mouser were appointed a committee to make the necessary arrangements.

A very interesting paper was sent in by Melville Attwood, Esq., and read by Vice-President Kinne. Specimens of rock sections accompanied the paper, which were shown and explained by the Secretary. Mr. Attwood's paper was on "The Importance of a Classification of Metalliferous Veins," the substance of which we give in another column.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Syndicate, Dec. 4th, $12,316.38; Northern Belle, Dec. 1st, $7,475.34; Northern Belle, Dec. 2d, $7,601.54; Standard Con., Dec. 1st, $38,829.61; California, Dec. 2d, $47,805.02; Con. Virginia, Dec. 2d, $51,083.96; Navajo, Dec. 8th, $3,600; Belle Isle, Dec. 8th, $10,000; Gila, Dec. 5th, $2,579.10; Navajo, Dec. 8th, $3,600; Belle Isle, Dec. 8th, $10,000; Northern Belle, Dec. 6th, $8,489.05.

"THE CALIFORNIAN."—We have before us the first number of "The Californian, a Western Monthly Magazine," published in this city by the A. Roman Publishing Co. The new magazine is founded by the originator of the *Overland*, and reminds us somewhat of that lamented publication. In style and typographical appearance it is, however, for superior, and the contents have a wider scope and more variety. We have as contributors to the first number, Emma F. Dawson, J. H. Hittell, Charles H. Shinn, Mary Austin, H. N. Clement, E. H. Clough, Richard Edward White, Minnie Booth Phelps, Chas. A. Wetmore, W. C. Morrow, Jr., Edward Sill, Prof. George Davidson, J. W. Gally, Chas. H. Phelps, Sarah E. Anderson, Fred M. Somers, Oscar Weil, D. S. Richardson, and Julia Bugeia. We are promised a magazine thoroughly Western in its character and we hope it will recieve liberal and hearty support. If the first number is an indication of the character of its contents for the future, it will speedily take its place among the first-class publications of the country.

THERE is a well-founded suspicion that one of the principal men concerned in the plot against the Czar's life, by the explosion last week, is a returned convict from Siberia.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

ALPINE.

COLORADO NO. 2.—*Argus*, Dec. 1: During the past week the 20 stamps in the company's mill have been kept running constantly on good milling ore. Everything in and around the mill is in good condition. The mine is looking as well as usual. Ore is being taken from the 100 level, also from the lower workings, to supply the mill. The west crosscut will be commenced to-day, to cut the ledge 80 ft north of the stope in the lower tunnel.

AMADOR.

BUTTE BASIN.—*Dispatch*, Dec. 6: We are pleased to learn that the energetic proprietors of the Butte Basin mine are now getting control of the water in their mine, and are now lowering it at a very encouraging rate. It was at one time feared they would be compelled to stop work owing to the great inflow of water, but we understand they are lowering it at the rate of about 14 ft every 24 hours.

BUTTE.

RICH MINES.—Oroville *Register*, Dec 5: The old Beehive quartz mine at Mount Hope, five miles above Forbestown, worked 17 years ago by E. H. Pratte, of this place, and others, and abandoned because it was supposed that the ledge had pinched out, has been reopened by Messrs. Mayberry and Mallard, experienced miners from the State of Nevada, and the result is the finding of a ledge, in richness equal to the once celebrated Allison mine of Nevada county. The company has erected upon the mine a substantial mill with eight stamps, which has been running about six weeks. Our informant, who is a gentleman of unquestionable veracity, saw from the mine, for six days' run, a gold brick valued at $2,000. The company, since commencing operations, have expended in Oroville alone for supplies, etc., over $60,000. This and the Banner mine, at Oregon City, a few miles from this town, worked for nearly 18 years, have, through the superior knowledge of working quartz mines obtained from experience in working the silver mines of Nevada, been reopened with astonishingly rich results. The *Mercury* learns from James Havey, Chief Engineer, that the property is being rapidly developed. Thirty-two men are employed. An eight-stamp quartz mill is kept constantly at work day and night. The ore is very rich and the rock is getting better every day. The main shaft is down 64 ft, and will be sunk 150 ft further. Sixty thousand ft of lumber has been ordered for use in timbering the shaft. On the 50 level a tunnel has been run into the mountain a distance of 100 ft, from which a drift has been cut and stoped a distance of 200 ft on the main ledge. Sulphurets of an exceedingly rich nature characterize the rock, and the assayer at the mill is confident that the mine is a bonanza of the first magnitude. The prospects in the Vermilion hydraulic mine, at Forbestown, purchased by Ourling Bros. & Belden, a year ago, from J. W. Vail, for $8,000, is yielding fine pay, principally coarse gold. The water to work this mine is raised from the South Fork ditch by a force pump, to Perkins' ravine in Yuba county, to the hight of 300 ft. The claim is worked through an open cut, and much difficulty is experienced in keeping the cut open, the bedrock being of a clay nature; the bank, when the ground is saturated with water, slides in and fills up the cut. The hydraulic claim of Sam Davis and John Guydery, purchased of Sam Vail, is presenting excellent indications. The hydraulic claims of Cruser & Anderson, Mooretown ridge, upon which they have been working to open for the last two years, is now in working order, and rich developments may be looked for as soon as they begin to wash.

CALAVERAS.

ANGELS ITEMS.—The *Echo*, of the 2d inst., contains the following items of interest: Mining in the vicinity of Vallecito is looking up. There are five gravel mines in active operation on the flat, but as water is scarce at the present time they are piling up the dirt preparatory to washing when the water becomes more plentiful. Mr. Mitchell, who is the owner of one of the mines on the flat, is said to be getting some very good prospects. The mines at Collierville are said to be paying well. They are among the best paying mines in the county. A quartz lode was recently discovered by a gentleman named Moore, on San Antonio ridge, between Murphys and Sheep Ranch. The vein is about 14 inches in width and pays from $15 to $20 per ton. The Cataract mine, which is situated at Echo, near the Stanislaus river, and which has been in litigation for some time, is about to resume operations again. This is one of the largest hydraulic claims in the county.

LONE STAR.—*Calaveras Chronicle:* A bonanza of surpassing magnitude and richness has lately been discovered in Lone Star mine at West Point. Twenty-three tons of ore, crushed in Carlton's mill, yielded 230 ounces of gold, worth $17.50 per ounce. That is an aggregate of over $4,000—a yield of about $174 per ton. It is very rich rock that produces like that, and what makes it more remarkable is the fact that the ledge is fully seven ft in width.

INYO.

PATTERSON PLACER MINE.—*Independent*, Dec. 6: The Patterson Placer mining company, comprising grounds located at Cherokee, Badger Hill and Chimney Hill, four miles above, received a patent thereto a few days ago. This mine is owned by Joseph Hustler, J. Nankervis, M. Fitzpatrick, the Eureka Lake Company, the Milton Water Company, estate of J. B. Hunter, deceased, and about 30 other persons. The claims include an average of over 300 acres, comprising some of the richest ground on the ridge.

MONO.

NOONDAY.—Bodie *Chronicle*, Dec. 6: The combination shaft is down 536 ft, but no more sinking will be done for the present. The new pumps have arrived, and one has been placed in position at the 312 level, and the other will be put in at the 512 level. The drift east from crosscut on 312 level is in 250 ft, meeting with strata of quartz and looking very favorable. The drift south, on vein No. 1, 312 level, is in about 200 ft, with a large vein and fine ore, assaying $200 a ton. The south drift on No. 2 vein is in 160 ft, but here the vein has pinched out and gone to the west. The drift north on vein No. 2 is in 160 ft, showing a large vein of paying quartz and fine-milling ore. The upraise from vein No. 2, 20 ft south of east crosscut, is in 75 ft, the vein being large, and giving good ore. On 212 level they have started a crosscut from the extreme end of south drift in North Noonday. It is now in about 60 ft in a good looking country. The upraise from this drift is in 125 ft, with a small vein of good ore. The Noonday mill is about finished and will probably be ready to start up on or about the 15th inst.

JUPITER.—The ore body in south drift No. 2 is two ft wide, a large portion of it being good ore. Assays of samples of ore from the face run from $62 to $118 a ton, mostly silver.

MCCLINTON.—At the end of the north drift, 319 ft from the shaft, a crosscut was started west and has been driven 27 ft, cutting two ledges of good looking quartz, which prospects well. The east crosscut from the new shaft has been driven 35 ft, and is now in 133 ft, with favorable prospects for striking a ledge.

COX PACIFIC.—The whole bottom of the shaft is in broken ledge matter, with some streaks of quartz, which give fair assays.

DEFIANCE.—Since last report the shaft has been sunk 40 ft, and in that distance passed through two more ledges, both pitching west and equally as promising as depth is attained.

QUEEN BEE.—Crosscutting for the ledge and now in 26 ft from the shaft, and in favorable-looking formation, which is mixed with strata of quartz.

SOUTH NOONDAY.—The new shaft is down 76 ft. During the past week very important developments have been made in the shaft. The ledge was cut at a depth of 70 ft. It is about four ft wide, dipping to the east at an angle of 60 degrees. Some of the ore has been assayed, giving very satisfactory results.

MARYLAND CON.—In sinking the new shaft a fine ledge of high-grade ore was struck on Thursday. This ledge is 18 inches in width, and increases as the sinking progresses. It has been recorded and is known as the McPherson ledge. It has an easterly dip of 80 degrees.

NEVADA.

DERBEC MINE.—Nevada City *Transcript*, Dec. 5: The gravel in the Derbec mine is now looking better than ever before. About 140 tons per day is being extracted, and during the past three weeks some $10,000 worth of bullion has been sent below. The gravel all passes through the Cox gravel machine already in operation. Another one of the machines is being put up to work the tailings, and will be put in operation the early part of next week. When the projected tunnel from North Bloomfield is completed, the mine will be immediately on a dividend-paying basis. It is believed that enough pay gravel will be found in putting the tunnel through to offset the expense incurred in its construction.

EAGLE MINE.—*Transcript*, Dec. 6: The Eagle quartz mine (formerly Davenport), on Deer creek, just above this city, owned by Messrs. Byrnes, Hubbard & Co., is being opened up by a force of six or seven men. The drift, at a depth of 70 ft on the incline, is being continued to the north, and is in about 100 ft. The vein is from eight inches to two ft thick, and there is now some 12 tons of ore on the dump that assays at $103, and will probably mill in the neighborhood of $30. This claim was formerly a splendid producer, and the developments since the present owners revived it have been so encouraging that they propose to erect hoisting works on it within a few weeks. The machinery will be run by water at a very reasonable expense.

THE PHOENIX MINE.—Work has been recommenced on the Phoenix (formerly Cunningham) mine, at the east side of Gold flat, and this time evidently in earnest. The workmen are cleaning out the old tunnel and retimbering it, and laying a track. Drifts are to be run on the north and south ore chutes, above the 210 level.

GILLESPIE'S MINE.—Gillespie & Son, on Gold flat, continue to take good ore from their mine across the road from the Thomas works. It will be remembered that the last crushing paid about $20 a ton, all specimens having first been picked out and only the low-grade rock put through. This mine has produced some of the richest specimens ever found in Nevada county.

NEW YORK HILL.—Grass Valley *Union*, Dec. 6: Some very rich quartz has been coming out of the Ford & McDonald claim, on New York hill, of late. Some of the pieces are said to be nearly half gold. The ledge, where this quartz is taken from, is small, but this is more than compensated for by its richness. The prospecting shaft on the Irish-American is down 100 ft, and from the fact that the flow of water is increasing it is expected that the ledge, which is being sunk for, will be reached any day.

STRIKE ON GOLD FLAT.—*Transcript:* George Simmons, of the Town Talk house, and some other parties, have recently made what is described as a very rich strike on Gold flat. They sunk a shaft 30 ft deep, and at that point developed the Green Mountain ledge, which has a westerly course from the school house, and is about two ft thick where tapped. The ore contains much free gold and sulphurets. The windlass, which has been in use thus far, is to be supplanted by a horse-power hoisting apparatus, and work will be carried on night and day.

EL CAPITAN MINE.—*Herald*, Dec. 6: The rock in this mine looks well, and the ledge is clearly defined. The ore taken out and crushed thus far in sinking the incline has paid $10 per ton, besides the sulphurets. A good six-inch pump is in the mine, which will be capable of keeping the mine free from water. The Superintendent has let a contract for sinking the incline down 100 ft further, and when that job is completed, tunnels will be run along the vein and stoping of ore commenced. The El Capitan proper extends 1,000 ft in length along the lode.

TUOLUMNE.

A MINERESS.—Sonora *Independent*, Dec. 6: We learn that Mrs. Zimmerman has struck very rich pay in her claim back of her store, on Washington street, which is at the base of the hill on which is located the Divoll & Co. bonanza, where $265,000 was recently captured. The lady is a host in herself, and manages her own claim. She employs two men in the shaft and attends to the windlass herself.

OLSEN DISTRICT.—Much excitement exists in the Olsen mining district, and a town site has been laid out. It is also said that 300 men are to be put to work in the Olsen mine; 60 immediately on different parts of the mine, and the balance as soon as it can be sufficiently developed to work them to advantage.

QUARTZ MILLS BUSY.—Some three years ago there were but three quartz mills in operation in this county, so depressed was that interest. At the present time we can count 16 running and about to run at no distant day, viz.: Confidence, Soulsby, Hunter, Spring Gulch, Morrish, New Albany, Riverside, Evans, Tyger, Patterson, Atlas, Harris, Heslep, Seebers, Golden Gate, Nonpareil, Mount Jefferson, Big Creek mill, Little Gormand (Saw-mill flat), Haight (Chile), Keltz, Starr King and Gem.

A GOOD CLAIM.—A big "chispa" was found in the Smith & Whiterock claim, at Brown's flat, on Friday of last week. The piece weighed 23¼ ounces and contained 18¼ ounces of pure gold. In three days the claim yielded five ounces of fine gold besides the chunk, or $436.

LIGUNA MINE.—We were shown some rich rock from the Liguna mine. The company have now about 25 tons out, which they will crush before taking out more. Should this lot prove satisfactory, permanent improvements will immediately be erected at the mine.

FERGUSON MINE.—*Union-Democrat*, Dec. 6: This week 230 ounces of retorted gold, of the value of about $3,700, was brought to town, the result of 12 days' crushing. The previous run, of 11½ days, yielded $2,274.78, making a total of nearly $6,000 for 23½ days' run in November. A rich body of ore is developed, and the mine promises to pay largely. Some of the ore is too rich to be worked in a mill.

RODGERS MINE.—Work is being pushed on the Rodgers mine, on Piety hill. The incline is now run 170 ft down. Tuesday it struck into an old drift known as the English tunnel, which has become a reservoir for water sinking from the surface. The water is being raised, which will take a few days, when the incline will be carried on. The ore taken out of the vein prospects well.

NEVADA.

WASHOE DISTRICT.

UNION CON.—Gold Hill *News*, Dec. 10: The drift running east, 10 degrees south, has reached what is supposed to be the east clay of the ore body, and sill floors are being extended along the drift, and it is being timbered up preparatory to extracting the ore which has been laid bare more than 80 ft.

MEXICAN.—The north drift, 2300 level, is cutting heavy clay seams held in bird's-eye porphyry, and in the clay are stringers of quartz dipping to the east and looking very promising.

CON. VIRGINIA.—Connection had not last evening been made between the south drift, 2150 level, and that north from the bottom of the joint Best & Belcher winze. It was expected, however, that every blast put in would cause an opening.

CALIFORNIA.—Stoping ore on the 1750 level, and from the drift south from the north winze, has been commenced.

SIERRA NEVADA.—The drift north from the east shaft is being continued through a fine vein formation; total length of drift, 140 ft. The stopes on the 2200 level yield 25 tons of good ore per day.

JUSTICE.—The Ramsdell mill is crushing ore from the mine and running steadily. The returns are sufficiently remunerative to warrant the continuation of the work.

OPHIR.—The southeast drift, on the 2200 level, toward the Hardy vein, is in 57 ft and passing through vein porphyry carrying streaks of quartz.

GOULD & CURRY.—The joint Best & Belcher crosscut east on the 1700 level is nearing the perpendicular of the new G. & C. and B. & B. shaft at the rate of six ft per day. The rock encountered continues to be hard and dry; total length of drift, 1,720 ft from the main north lateral drift, which runs 300 ft east of the Bonner shaft.

JULIA CON.—The winze from the 1800 level is being continued on down through a body of fine quartz; total depth, 172 ft.

BELCHER.—The crosscut east, 2760 level, is now in 75 ft, and without material change, the quartz encountered being of a lively and promising character. The south drift on this level is in 340 ft.

SAVAGE.—Crosscut No. 2, 2200 level, has been pushed steadily forward since last report, and continues in quartz the face 140 ft from the main lateral drift. Indications of water having been encountered in crosscut No. 1, it has been discontinued; total length, 138 ft. The tank drift, 2200 level, is in 65 ft.

ALTA.—The last set of timbers above the 1950 level of the incline was placed to-day. Of late, work in this part of the mine has disclosed some very fine quartz and some stringers and bunches of ore. The Lady Washington drift north, on the 1550 level, is nearing the north line of that mine, and is in fine vein matter.

HALE & NORCROSS.—Crosscut No. 2, 2200 level, is in 00 ft, the face in good vein matter carrying stringers of quartz. Crosscut No. 3, 00 ft from the Chollar line, is in 35 ft, and is in the matter of the vein which looks well.

LEVIATHAN.—The crosscut east from the main south lateral drift on the 750 level is now in over 100 ft, over half of it in the ore vein. Thus far only low-grade ore has been encountered, but something better is expected before the east wall is reached. Other crosscuts at more eligible points further north will be commenced soon.

UNION SHAFT.—The foundations for the pumping engines are coped and ready for the machinery. The large walking beam of the engine has been received and is being placed. Surface improvements are about completed, and the building enclosing the pumping engine and air compressor has been finished.

SOLID SILVER.—The repairs to the main tunnel are completed in good, substantial style, and yesterday a drift or crosscut east was started near the face of the tunnel to intersect the east ore vein. This will make the second crosscut, and is expected to develop valuable ore at that point.

BELMONT DISTRICT.

BELMONT.—*Courier*, Dec. 6: The latest report from this mine, dated Dec. 1st, says: On Tuesday last, on drift north from ore body, between 300 and 400 levels, we struck some very rich ore. We then commenced sinking and found it getting larger every foot we advanced; shall continue same, as I do believe it will open up a large body of ore. The ore body in north part of mine is improving every day, and the ore of a much higher grade, some of it assaying $2,000 per ton.

SAN ANTONIO MINE.—Mr. Coulter, the Superintendent, in his report of Dec. 3d, says: Since my last report we have crosscut the ledge at the bottom of the winze and find it over 10 ft thick at that point. The vein stuff consists of broken up quartz and porphyry mixed with clay. Three assays made last week gave as follows: Decomposed quartz mixed with clay, etc., $12.56; porous quartz, yellow chlorides, $43.08; poorest vein matter, $9.43; average about $22 per ton in silver. These assays from the ledge several hundred ft north of the ore chute leads me to believe that we will surely find ore, on our 450 level, as much richer than the above essays as the difference is in the same distance on the surface. We have also started a drift northwesterly from the winze, following on a vein of fine chloride. This drift is now in 15 ft, and the ore improves as the work progresses. What ore we extract as we run through it is stored in the 300 level.

BRISTOL & PIOCHE DISTRICT.

ITEM.—Pioche *Record*, Dec. 6: The furnace which started up on the 21st of October, was run down for the want of coal on the first of December, having turned out during that time bullion in large quantities and working through a large amount of ore. By the time the furnace will be ready to start up, on the 20th, it is expected that in the interval coal will come in sufficient quantities, and with the amount that will continue to come in daily, the furnace will be able to run from 100 to 150 days.

TEM PAHUTE DISTRICT.

ITEMS.—Tybo *Sun*, Dec. 6: The altitude of the mines above the base of the mountain is 800 ft, the average dip of mountain from summit to base is 30°, course of vein is north and south and dips to the east. There are 12 pipes or chimneys of ore showing itself on the surface and different workings of the different mines from the Blue Belle on the north to the Baalbec on the south, and all dipping apparently on the strike of the lode or mineral belt to the north and east. There are five pipes or chimneys of ore on the hanging wall from 25 to 300 ft in length, namely: the Baalbec, Tenoria, Savage, Inca and Bagdad. The Silver Peak, Santa Cruz & Co., on the quartzite or footwall there being a body of lime or tap rock on the surface. Present developments justify an output of 300 tons of free milling ore per month.

WHITE PINE DISTRICT.

TREASURE HILL.—Eureka *Sentinel*, Dec. 4: Joe Grandelmeyer arrived from Hamilton yesterday. He reports that mining matters are rather dull around Treasure hill. Work is progressing in the Eberhardt and Henry tunnels, and Hon. Thos. Wren is also running a tunnel into the Gb Joe, but outside of this little work is being done. He speaks in confident terms, however, of the future of White Pine, and is positive that it will yet take rank among the bullion-producing camps of this coast.

SULPHUR MINES.—Winnemucca *Silver State*, Dec. 5: J. T. Jeffress, Superintendent of the Rabbit Hole sulphur mines, informs us that he has about completed arrangements to supply the whole country with refined sulphur. All the Rabbit Hole mines are now consolidated and owned by one company. The company have let a contract to haul 1,500 tons of brimstone from the mines to the railroad at Humboldt House, and are now making shipments regularly. They expect shortly to be able to deliver from 10 to 12 tons of sulphur daily at the railroad, and will be able to deliver it at a lower price in San Francisco than what it can be imported for. Their intention is to supply the whole Pacific coast with the article, as there is an unlimited supply of it at the mines. Considerable sulphur is used in the manufacture of acids, and there is quite a demand for it for this and other purposes in all parts of the country.

ARIZONA.

GLOBE DISTRICT.—*Star*, Dec. 4: Fifty miners are at work on the Mack Morris. A 10-stamp mill has been bought for the mine and will soon be on the ground. Ninety tons of ore from the Stonewall No. 1 mine, of all classes, milled at the Isabella mill, paid $55 per ton. The McCormick mine, owned by Mr. Mansfield, is developing finely. In the Stonewall Jackson mine a rich strike has been made on the 300 level; they shipped by express several hundred pounds of native silver from this level. One five-stamp mill belonging to the Isabella company, running on custom ores of this district, is turning out $30,000 per month. In the Alice and Southwest Alice late developments place them among our best mines. Developments on the Black Prince show some good ore and great results are expected by the owners.

SANTA RITAS.—It is said that Eastern capitalists are negotiating for a group of mines in the Aztec and Tyndall districts, and they have satisfied themselves of the value of the property examined. These gentlemen propose to take a group of 13 mines, make two incorporate companies of them (or more), and set aside one-half of the entire capital stock for sale, the proceeds of which shall first develop the leading mines of the companies, and build reduction works able to handle 30 to 50 tons of ore per day. A gentleman who left here a month ago for the East, telegraphs that he can organize a strong company for the Santa Ritas, who now owns a first-class 10-stamp mill, improved roaster, and all the appliances for working ores by the lixiviation process, and they desire to arrange for active operations early in January.

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Important Patent Decision.

The United States District Court for the Northern District of Illinois, has recently rendered a decision which will be of interest to patentees generally. Section 4901 of the Revised Statutes of the United States, title "Patents and Copyrights," declares that: "Every person who in any manner marks upon or affixes to any unpatented article the word 'patent,' or any word importing that the same is patented, for the purpose of deceiving the public, shall be liable, for every such offense, to a penalty of not less than $100, with costs, one-half of said penalty to go to the person who shall sue for the same, and the other to the use of the United States, to be recovered by suit in any district court of the United States within whose jurisdiction such offense may have been committed."

It appears that the Singer Sewing Machine Company retained the word "patented" on the machines manufactured by them, notwithstanding that all of the patents under which they were formerly made have expired. William G. Wilson, the inventor of the Wilson sewing machine, brought suit against the Singer Company, to test their right to use the word "patented" on their machines. The declaration contained three counts, charging a violation of this statute by putting on 100,000 machines the words "Patented Sept. 10th, 1846; May 8th, 1849; Nov. 3d, 1850; Aug. 4th, 1851; Aug. 12th, 1851; April 11th, 1854; May 30th, 1854; Nov. 21st, 1854; Dec. 19th, 1854; May 29th, 1855; Oct. 9th, 1855." This made 100,000 offenses, which, at $100 for each offense, would make the neat sum of $10,000,000, of which one-half was to be given to the informer. A demurrer was filed to the declaration, and argued at some length.

Judge Blodgett, in deciding the matter, declared that the point made by the plaintiff was that "because the Singer patents had expired the company had no longer the right to affix to the machine the word 'patented,' or any word or sign importing that it, or any part of it, was patented or had been patented." The statute was highly penal, and its scope would not be extended by implication. It must also be strictly construed. The law of the United States in force at the date of the several dates inscribed on the machines limited the life of a patent to twenty-one years. That was fourteen years for the original term and seven years' extension, if an extension was granted. It is clear then that at the time when the company was charged with having committed the present offense, the patents mentioned in the inscription had expired by limitation of law, even if all had been extended so as to remain in force the full twenty-one years. The mischief which the statute intended to punish could hardly be stated more concisely than in the words of the law itself, "the purpose of deceiving the public," *i. e.*, stating falsely that an article was then the subject-matter of a patent. Could it be said that the public was deceived by the notice inscribed on or affixed to a manufactured article that it had been patented and that the patent had expired? The "public" was presumed to know the law as well as a patentee—to know that a patent issued on the 9th of October, 1855, had expired on the 1st of November, 1876. If, therefore, the inscription were true, in fact, as it was conceded to have been in the present case, it did not subject the defendant to the penalty of the statute. After a full consideration of the case, the Judge concludes that the plaintiff had not made out a case within the intent of the law. The question at issue involved the merits of the case, and the demurrer must be sustained.

Petroleum Fuel in Iron Furnaces.

A process of using crude petroleum as fuel is employed at the Eames Iron Works, Titusville, Pa. The advantages of petroleum as a fuel are the perfect control under which the heat is held, the extremely high calorific intensity, and the freedom of the fuel from any elements injurious to the iron. It is claimed that the work can be performed much quicker, and the quality of the product can be made more uniform and of higher grade, than can be secured with coal fuel.

The generator wherein the petroleum is vaporized consists of a cast-iron vessel with horizontal shelves projecting alternately from opposite sides, over which shelves the oil, entering overhead by a quarter-inch pipe, trickles down. This generator is contained in a brick setting about six feet square and five feet high. Around and below this is a large iron box called a superheater, the four sides of which are full of flues. Below that again is the furnace, containing another superheater surrounding the fire.

A six-inch oil pipe 75 feet high stands a short distance away. This is sealed at the top, and is pumped full of oil by means of a smaller pipe running up its side. There is also an overflow pipe attached, by means of which the large pipe is relieved when full, the oil returning to a tank built in the ground for that purpose. At the bottom of the great pipe is a small one that leads to the top of the generator, while another pipe runs from the boilers to the bottom of the same vessel and supplies the steam. The 75-foot column of oil yields a uniform pressure of a trifle over 24 pounds, but a steady 20 pound is all that the gauge is required to indicate for the generator. The column is used in preference to a pump on account of the evenness of its pressure, which never varies in the slightest degree. From this column the generator is fed through a small aperture, the oil trickling down by drops on the different series of shelves mentioned above.

The steam, after leaving the boilers, is passed through the coil of pipes in the superheater until it is heated to incandescence and finds vent in the bottom of the generator, and there meets the oil as it drips from the bottom shelf. Every trace of oil is taken up and swept on to the combustion chamber, where it is ignited and also forced into the furnaces by the air blasts which it encounters at this point. The combustion chamber consists simply of a cellular tier of fire bricks placed on ends, extending across the bridge wall. Within these cells combustion begins; and it is found that if this combustion space has a horizontal thickness of more than 18 inches, the fire bricks fuse down. The heat escaping from the two furnaces passes through the flues of the two 60-horse power boilers, which supply the power for all the heavy machinery in the works. A 12-horse auxiliary boiler furnishes the steam for the generator.—*Oil City Derrick.*

New Caledonia Nickel.

At the present Industrial and Scientific exhibition at Paris, France, a collective exhibit of nickel is made by the *Societe Francaise Anonyme de Nickel*, which company has been formed to work the extensive deposits of nickel ore, discovered by M. Jules Garnier in New Caledonia, and called after him *Garnierite*, by the unanimous consent of Professors Dana and Liversedge, and Mr. W. B. Clarke, the American geologist, who were associated in the discovery. M. Garnier believes this mineral to be contemporaneous with the magnesian rocks which constitute the frame-work or skeleton of the island, and to have been deposited while in solution in the hot and siliceous water, in the numerous clefts of the serpentines. It is here that the ore is found in the greatest purity and in the largest quantities, but it is also met with in the diallage, diorite and amphibolite rocks, which cut up the serpentines into innumerable veins. Though garnierite is generally accompanied by oxides of iron, chromate of iron and black oxide of cobalt, it is distinguished from all other nickel ores that have yet been discovered by being absolutely free from sulphur, arsenic and antimony, which have rendered smelting so difficult an operation. It is a double silicate of nickel and magnesia.

Nickel was formerly extracted from its ore by a long series of complicated operations, embracing both the wet and dry ways; but as, in garnierite, there is no sulphur, arsenic or antimony, and but very little iron or cobalt, only two dry operations are required. The ore is raised by Messrs. John Higginson & Co., from their mines near Numœa, and subjected to a preliminary fusion in blast furnaces erected on the spot. It is then shipped by the *Societe Francaise Anonyme* to their works at Septemes, near Marseilles, where it is refined in special furnaces by methods patented by M. Garnier, who has joined the company. The metal is supplied to founders in a perfectly pure state, in the form of ingots and granules, or alloyed with an equal quantity of copper. In this way a perfect guarantee is afforded to purchasers, which is not the case in alloys with an undefined content of nickel. In order to facilitate the introduction of their metal into foreign countries, however, the company undertake to supervise the mixing and casting of white nickel bronze, containing about 20% of pure metal, which is sufficient to prevent oxidation.

The object of the collective exhibit is to show the adaptability of nickel alloys to the various branches of industry, and especially the great advantage of employing nickel bronze, instead of brass nickelized by electro deposit. While the former keeps bright without any special cleaning, the thin nickel coat of the latter soon wears off at projecting edges, and exposes the brass beneath. While being 20% stronger than brass nickelized, nickel bronze costs only 5% more at the low price at which the raw material is sold by the *Societe Francaise Anonyme*; and another point to be noted is that nickel bronze may be worked by exactly the same plant and processes as copper and brass.

The case also contains some specimens of *acier-larocque*, or cast nickel steel, and its industrial applications, exhibited by MM. Rullier, Mauget et Cie. This combination is the result of experiments by M. Larocque, who found that a small quantity of nickel (3% to 10%) greatly increases the strength of steel, especially the resistance of a cutting edge, while, at the same time, preventing oxidation. An anvil, hammers, axes, wheels, rolls and parts of machines are exhibited, and show a remarkably fine surface.

A Valuable Invention. — Westchester, South Carolina, has a cotton factory that spins yarn directly from the seed cotton. The machinery is simple, and it is claimed that by its use the value of the staple can be increased nearly 100%, taking into consideration the amount of money saved on bagging, ties, packing, weighing, storing and shipping. The Atlanta *Constitution* predicts that in the course of the next two years at least 100 of these factories will be in operation, in Georgia, as "wherever there is a grist mill, planing mill or saw mill, a yarn factory can be added without an increase of power, and at a very little increase in cost."

The Kane Geyser Well.

A singular freak of nature occurs in the Kane geyser, or Spouting water well, which during the past year has attracted such general attention in Pennsylvania. The cause of the action has been so erroneously represented that a correct explanation seems to be demanded.

This well is situated in the valley of Wilson's Run, near the line of the Philadelphia and Erie railroad, four miles southeast from Kane. It was drilled by Messrs. Grubout and Taylor, in the spring of 1878, to a total depth of 2,000 feet. No petroleum was found in paying quantities and the casing was drawn and the hole abandoned, since which time it has been throwing periodically—10 to 15 minutes—a column of water and gas to hights varying from 100 to 150 feet.

During the operation of drilling, fresh "water veins" were encountered down to a depth of 364 feet, which was the limit of the casing. At a depth of 1,415 feet a very heavy "gas vein" was struck. This gas was permitted a free escape during the time the drilling was continued to 2,000 feet.

When the well was abandoned, from failure to find oil, and the casing drawn, the fresh water flowed into the well and the conflict between the water and the gas commenced, rendering the well an object of great interest. The water flows into the well on top of the gas, until the pressure of the confined gas becomes greater than the weight of the superincumbent water, when an explosion takes place and a column of water and gas is thrown to a great hight. This occurs at present at regular intervals of 13 minutes and the spouting continues for 1½ minutes. On July 31st, Mr. Sheafer (aid McKean county) measured two columns, which went to hights respectively of 120 and 128 feet. C. A. Ashburner says: On the evening of August 2d, I measured four columns in succession, and the water was thrown to the following hights: 108, 132, 120 and 138 feet.

The columns are composed of mingled water and gas, the latter being readily ignited. After nightfall the spectacle is grand. The antagonistic elements of fire and water are so promiscuously blended, that each seems to be fighting for the mastery. At one moment the flame is almost entirely extinguished, only to burst forth at the next instant with increased energy and greater brilliancy.

During sunshine the sprays form an artificial rainbow, and in winter the columns become incased in huge transparent ice chimneys. A number of wells in the oil regions have thrown water geysers similar to the Kane well, but none have attracted such attention. As early as 1833 a salt well, drilled in the valley of the Ohio, threw columns of water and gas at intervals of 10 to 12 hours to hights varying from 50 to 100 feet. This well is possibly the first of the "water and gas geyser wells."—*Stowell's Petroleum Reporter.*

Michel's Improved Amalgamator.

In our issue of March 29th, of this year, page 193, we described and illustrated an amalgamator invented by Justin Michel, of Nevada City. We see by the Nevada *Transcript* that the invention has been in use at the Maltman reduction works of that place, and, after testing the apparatus, the proprietor has endorsed it in the following language:

One of the Michel pans has been running almost constantly at my works for the past year, and I have no hesitation in pronouncing it to be the best amalgamator for gold ores on the Pacific coast.—O. Maltman, Nevada City, November 24th, 1879.

A *Transcript* reporter has visited the Nevada foundry, where the manufacture of these pans has been commenced on an extensive scale, and he describes the construction in detail, but as we have already done so, a repetition is unnecessary. The *Transcript* adds, however, the following:

Settlers are not required in connection with the Michel pan, which is a great saving of course. With a motor of one-horse power, the rate is from 35 to 37 revolutions a minute, and there is a reducing capacity of over two tons of ore per 24 hours. The rich arsenical sulphuret ore recently produced at the Kenton mine was put through the pan at Maltman's works with perfect success.

One important feature of this pan is that no quicksilver is lost during its operations. The tailings from it have been assayed on various occasions, and found to contain so little free gold that they would not pay for re-working by any known process.

To prove that the introduction of it will enable the working of lower grade ores than can be handled profitably with other methods, one instance in particular can be cited. Sixteen hundred pounds of tailings from a quartz mill in this vicinity were recently put through it and paid at the rate of eight dollars per ton.

The total sales of public lands to actual settlers for the past five years range about as follows: For 1875-76-77 they reached from 3,500,000 to 4,000,000 acres each; for the year ended June 30th, 1878, 7,166,974 acres, and 8,650,119 acres during the year ending with last June. The totals of the entries under the Homestead and Timber Culture law contract as follows: For the fiscal year of 1877, 2,698,771 acres; for the fiscal year of 1878, 6,288,799 acres; for the fiscal year 1879, 8,026,685 acres.

Origin of the Colorado Canyons.

Pah-goo, a Ute Indian, relates to George West some of the traditions of his tribe respecting the cataclysm which gave Colorado its present peculiar appearance. Pah-goo calls the Colorado river the Toom-pinto-weep, and says that there is an old river bed fully half a mile deep. His forefathers had a tradition that, long years ago, they had lived near a vast warm lake northeast of the big river; that the country was warm, full of big trees and big deer, and big oxen with white horns; that big fishes and snakes as long as a 100 lodge poles abounded in this lake; that one day all the big oxen began to roar together, and that they raised such a steam from their nostrils the earth reeled and the sun was obscured; that suddenly the lake fell, and continued falling for three moons, and then became so much reduced that they knew it not any more, but that the big lake they found had been drained away to the south, and that its warm waters had cut out through the mountains the present canyon of Green river, and of the big river (the Colorado); and that the old bed in the Toom-pinto-weep is where the lake waters were drained. All the big deer and the oxen with white horns strayed away eastward and perished in the mountains. A big flood soon after the above occurrences formed Grand River canyon, and after this flood came a small race of people who had skin canoes, and who brought seed corn of a small kind, called in Spanish chiquito mays; that these people were almost white, and that they taught the Utes how to make good spears and bows and earthenware; that they built stone houses in the cliffs, and cultivated pumpkins, corn and beans; that they had silver and gold in abundance, and iron tools that they had obtained in the high mountains to the northeast; that afterwards, from the northwest, big red Indians came over to this country and killed and drove off the little people, who finally all went south, as well as the big red men, who are the Apaches, Navajoes and Kiowas.

These small and nearly white people were undoubtedly the Aztecs, who certainly wandered in the direction of Colorado, being driven there by the occasional plagues which nearly depopulated northern Mexico centuries ago. Pah-goo declares that "grande lagarios" (probably alligators) were found among the Apache and Navajo Indians, but that they all disappeared as the country became drier and colder. It appears from the traditions that melted rocks were poured out everywhere and left the country desolate. It is, also, of tradition that in the old river bed of the Colorado there is plenty of gold, which fact was related by the Aztecs or small men.

New Gold-Saving Machine.—At the Scadden Flat mill, a new style of gold-saving machine has been set up by the patentee, Mr. Newbury, who is experimenting with the tailings that run away from the sluices below the mill. The machine bears some resemblance to a mammoth smoking pipe, the stem being an upright cast-iron tube, about five inches in diameter, which connects at the bottom with another hollow upright casting, about twelve inches in diameter, which rises alongside of the stem to about one-fifth of its hight. Inside of this bowl is an iron framework with both upright and horizontal flanges, which is worked by a ratchet leverage, and is intended to keep the quartz-sand and quicksilver in motion. The machine is charged with six flasks of quicksilver, which amount makes the quicksilver rise to the hight of about 15 inches in both the hollow stem and bowl. The quartz tailings are conducted into the stem or column at the top by a funnel, and from the stirring motion given to the quicksilver, by the framework and flanges spoken of, the sands pass down through the quicksilver in the stem and up through that in the bowl and then discharge to waste. It is claimed that by this operation (every particle of sand having to pass through the mass of quicksilver), that the free gold, however infinitesimal in fineness, is saved, and that the sands which escape will not show the least "prospect" in gold. The theory of this invention is not new, but the mechanical operation of it is different from any that has yet been presented. As it is generally admitted that there is quite a percentage of fine gold lost in ordinary milling operations, any invention that gives promise of reducing this loss is worthy of study and trial on the part of those engaged in the business of reducing quartz.—*Grass Valley Union.*

Little over 40 years ago every particle of the table cutlery used in the United States was imported from England. At the present time, out of an annual consumption of $2,430,700 worth of those commodities, England supplies not more than 8%, and American cutlery now goes largely to Australia, South America, and even to Europe.

The jury impaneled at the international exhibition of science applied to industry in France, has awarded the diploma of honor to the signal corps of the United States army for the most perfect system of collecting and utilizing meteorological data for the benefit of commerce and navigation.

The highest inhabited house in the world is said to be the one erected for the miners employed on Mt. Lincoln, in the main range of the Rocky mountains, Park county, Col. It is 14,157 feet above the level of the sea.

The Study of Political Economy.

An eminent English writer in a leading American periodical* holds that political economy is not a science, and argues lucidly in support of his view. Upon this leading point, however, the doctors disagree, and we are willing that they should have the full enjoyment of their discord. We find in the lateral branches of this writer's argument certain statements, definitions and allusions which seem to us of the utmost importance, and we use them as a text upon which to found an exhortation.

In this age of our country, which may, we think, be fitly termed its industrial age, it seems especially desirable that those actively engaged in the development of our industries should put forth extra effort to inform themselves as fully as possible concerning the laws which underlie production and trade. Our understanding of the natural laws and of the material which are involved in our work is advancing most rapidly through the discoveries of scientific investigators and in the light of experience. It cannot be doubted that this branch of our industrial education is progressing faster than is our understanding of the laws which underlie success in production and trade as embodied in political economy. The plain inference is that our minds should be rounded up in this direction, and therefore we commend all our readers who are not familiar with the subject to give a part of the coming winter evenings to the study of political economy. For the young man of sober mind, and possessed of a desire to master some of the world's most practical problems, the study of political economy affords an opportunity for self-culture easily attainable and very satisfactory.

We find in the article alluded to above, the most direct commendation of political economy to the ordinary reader. The writer fitly denounces the style adopted by some economical writers, and which he attributes to their overweening desire to make a "science" of their subject, as though, forsooth, in making their meaning obscure by the adoption of ingenious and uncommon terms, they could elevate the theme to the plane of the exact sciences. As this writer forcibly observes:

"The language of every-day life was cast aside, and that of intellectual casuistry put in its place. Merchants, traders and artisans found matters which occupied their conversation every hour wrapped up in language new, hard and unfamiliar, and this, be it carefully observed, on matters which they felt no want of good and expressive words to discuss. Had they been in search of astronomical or geological information, unusual language would have seemed natural; they would have had the feeling of their own ignorance and of the abstruse nature of the subjects. But to hear buying and selling, talked of in hard words and scientific formulas, could only repel them from listening. They called it jargon. Can anyone after this be surprised that a scientific economist is the one person whom every one turned away from on questions of supreme economical importance?"

But this writer does not stop with the denunciation of those who have succeeded in making economical principles obscure and unintelligible. He gives a most encouraging and truthful definition of what political economy really is, and we commend his words to those who may be prompted to take up the line of inquiry which we have advised. He writes as follows:

"Political economy stops at common observation. Unlike geometry and chemistry, it has no beyond. It does not reveal a single new truth which, in some form or other, was not previously known and acted upon by men possessed of natural sagacity. It examines and takes to pieces common processes which underlie the economical action of all men. It shows what they are—why intelligent men have practiced them as the obviously true and natural course to adopt. It discerns the rules which have governed their action, and it can speak of laws, but so also can the laborer, who knows that a vigorous hoeing will greatly enlarge the crop of turnips. Political economy is not a science, but a body of systematic knowledge, gathered from analyzing common processes which the human race has pursued at all times with greater or less efficiency. Its vocation is to unravel the complications of industry and trade, and to apply the suggestions of common sense and natural sagacity to the processes they employ.

Such, in brief, is the study which all our wide-awake industrialists, who have hitherto neglected it, should make a part of their winter's intellectual work. The facts and the deductions from facts which they will acquire and master will give many of them new insight into the causes which underlie success and failure in the world of industry, and there will be many points gained for guidance in individual affairs. At the same time, too, those who pursue the study conscientiously will find their intellectual powers strengthening and sharpening as they proceed, and the result will be that their fathers will have better sons, their children better fathers, and the State better citizens, both as electors and legislators. And the State has need of such a gain.

*"Is Political Economy a Science?" by Prof. Bonamy Price, in *North American Review* for December.

Useful Information.

Belting.

Upon this subject, so important to mill and machinery men, the Cincinnati *Artisan* has this to say: Among the valuable elements entering into belt depreciation may be mentioned its length, width and thickness, strain, friction or power to transmit tension, proper adjustment and temperature. If the belt is of leather and oak tanned, it will last one-third longer than a chemical tanned. The manner in which belting is laced or joined together makes a great difference in the wear. Having each end of the pieces to be joined cut off true and square, and laced not too tightly, the wear of the belt may be decreased 20% per year. Some of the methods used to prevent a belt slipping on the pulley are detrimental to its wear, among which may be mentioned powdered rosin or pitch, which soon penetrates the leather and rots the belt. Roughing the surface by filing is another source of wear. Running a belt too tight on a pulley will generate heat, decompose the oil and organic matter in the belt, and hasten its decay. In having a belt sufficiently tight to convey the power and not slip on the pulleys, or so accurately arranged as to just do the work only, the depreciation on the machine may be decreased 2% a year, and on the belting over 20%. This is further seen when we consider that a three-sixteenth-inch leather belt, three inches wide, has a breaking tension of 2,400 pounds, and an ordinary machine with this size belting can be successfully worked with a permanent tension of 180 pounds. Doubling the tension, whilst it would not break the belt, yet the additional force constantly employed—being an increase of about 1-13 of its breaking tension—is so much useless friction to be overcome, and an additional strain on the entire machine, expended to resist the former and a consequent added element of actual wear.

A belt of unequal thickness will not only run badly, but wear much faster than one of equal thickness throughout. Rubber belts depreciate faster than leather. Frequently a few minutes of quick motion will roll the gum off in such quantities as to entirely destroy the belt. During freezing weather, if moisture finds its way into the seams, or between the different layers of canvas in rubber belts and becomes frozen, the layers soon tear apart and the belt is ruined.

Using leather belts in damp places, or where steam comes in contact with them, materially hastens depreciation; fully 10% faster than when run in a dry place.

Preserving Bodies. — Mr. Kreismann, United States Consul-General at Berlin, in his dispatch to the Department of State communicates a description of a newly discovered process for the preservation of dead bodies. The German government has induced the patentee to abandon his patent, and has made public a description of the process. The following extracts are translated from the Berlin newspapers: The dead bodies of human beings and animals, by this process, fully retain their form, color and flexibility for years and may be dissected, while decay and offensive smell are completely prevented. Upon incision, the muscular flesh shows the same appearance as in the case of a fresh dead body. The liquid used is prepared as follows: In 3,000 grammes of boiling water are dissolved 100 grammes of alum, 25 grammes of cooking salt, 12 grammes of saltpeter, 60 grammes of potash and 10 grammes of arsenic acid. When cool it is filtered. To 10 liters of this liquid, 4 liters of glycerine and 1 liter of methylic alcohol are added. The process of embalming is by saturating and impregnating the bodies with it. From 1½ to 5 liters of the liquid are used for a body.

An Effective Glue.—A very effective glue mixture is said to be employed by Turkish artisans in the nice work of attaching diamonds and other jewels to their metal settings. In the production of this substance the method pursued is to dissolve five or six bits of gum-mastic, each of the size of a large pea, in as much spirits of wine as will suffice to render it liquid; in another vessel as much isinglass—previously softened in water—is dissolved in brandy as will make a two-ounce vial of strong glue, adding two small bits of gum ammoniac, this being rubbed until dissolved. The whole is then mixed with heat, and kept in a vial closely stopped; when it is to be used, the vial is set in boiling water. This cement resists moisture, and will indissolubly unite two surfaces of polished steel.

Brown Dye for Silk.—Fill a copper or sauce-pan with river water. When it gently boils, put in a quarter of a pound of chipped fustic, two ounces of madder, one ounce of sumac, and half an ounce of cam wood—if not required to be so red, the cam wood may be omitted. These should boil at least from half an hour to two hours, that the ingredients may be well incorporated. The copper must then be cooled down by pouring in cold water. The goods may be then put in, and simmered gently from half an hour to an hour. If this color should appear to want darkening or saddening, it may be done by taking out the goods and adding a small quantity of black dye or a small piece of green copperas. When of a proper color, rinse in three waters and hang up to dry.

Uses of Euphorbia Gum.

The London *Times* says: Some few years since a survey was being carried out in Natal for the Colonial government, during which it was discovered by one of the officers engaged on the work, that when certain plants belonging to the natural order *Euphorbiaceæ* were cut with the cleaning knives, the gum which exuded from the plants adhered firmly to the blades, and was very difficult to remove. It was, moreover, found that the knives so coated did not rust, and this led to further experiments being made with the view of utilizing the gum as a preservative material. Iron plates were coated with the gum and subjected to immersion in the waters of South Africa, which are stated to be proverbial for their foulness and for the rapidity of the growth of vegetation. The euphorbia in Natal grows in close contiguity to the sea-shore, so that there was ample opportunity for securely testing its value as a protective covering for iron against corrosion and marine growth. The experiments proving perfectly successful, it was then sought to put the discovery into a practical form. To this end the gum was dissolved in a preparation of spirits, and this was found to be a ready means of applying it as a coating for ships' bottoms and for ironwork generally requiring such protection, the spirits evaporating and the gum being left on the surface of the metal. With this preparation experiments were made a few years since by Sir Andrew Clarke, C. B., who had a sheet of iron coated with it and placed in the waters in her Majesty's dockyard at Chatham, where anything immersed becomes rapidly fouled. At the end of two years the sheet of iron was taken out and was found to be quite clean, and free from fouling and corrosion. The composition has also been successfully tested in Africa against the ravages of the white ant. This success is attributed to the circumstance that the gum of the euphorbia, which forms the base of the fluid, is of such an intensely bitter nature that it paralyzes the efforts of all insects to attach themselves to it, or to bore into any substance coated with it. These successes have led to its adoption in practice for the purposes above indicated, and it is now being introduced in England. We have examined several applications of this composition, which gives a glossy coating alike impervious to air or moisture, while, according to results, its own peculiar protective property remains unimpaired.

Good Health.

Causes of Insanity.

A table in the last report of the Utica State insane asylum, giving the occupations of the patients, shows that by far the largest number (282 in a total of 410) whose occupation was known were farmers' housekeepers, meaning, we suppose, farmers' wives, laborers and domestic servants. This illustrates that a monotonous and toilsome life, with little or no relaxation or recreation, is more liable to unsettle the mind and destroy the reason than a life of greater mental and social activity. Most of the patients were native Americans, and married. Their ages, in the main, were from 20 to 40; very few were illiterate; but few also had more than a common-school education. In 427 cases but 122 inherited any taint of insanity; 205 patients remained not over six months, and 141 not over two months, showing that the malady was not severe. Intemperance was a minor cause—11%. Female disorders caused about 12%, while the prime cause in the largest number of cases was ill-health, stimulated by overwork, grief, anxiety and sleeplessness. To the causes cited above which encourage mental disturbances, we would add dyspepsia, due to poor or ill-cooked food. In this connection we would refer to the admirable paper on the health of Massachusetts farmers, by Dr. J. F. Adams, of Pittsfield, in the report of the Massachusetts State Board of Health for 1874, in which a large amount of interesting data is given regarding the ill-health of the farmers, and especially of their wives and daughters. Overwork, exposure, poor food, unsanitary dwellings, impure water, unventilated bedrooms and insufficient recreation, are all mentioned as the chief causes of sickness among this class. It is denied that farmers are specially liable to insanity, yet it is added that causes of insanity are not altogether wanting, as shown by the 81 farmers admitted to the asylums the year before. The farmer lives amid more natural conditions than the artisan, business or professional man; but, while he escapes intellectual strain, he labors too incessantly and joylessly, and frets and worries about his crops, his stock and his mortgages. The remedy is more recreation and less work. Then the farmer may lose his reputation for chronic grumbling. —*Sanitary Engineer.*

How to Obtain Sleep.—The following is recommended as a cure for sleeplessness: "Wet half a towel, apply it to the back of the neck, pressing it upward to the base of the brain, and fasten the dry half of the towel over so as to prevent the rapid exhalation. The effect is prompt and charming, cooling the brain and inducing calmer, sweeter sleep than any narcotic. Warm water may be used, though most persons prefer cold. To those suffering from over-excitement of the brain, whether the result of brain-work or pressing anxiety, this simple remedy is an especial boon."

Poisoning by Moldy Bread.

That the introduction of fungi into the human system is often attended with fatal results cannot be doubted. Moldy cheese is the delight of certain palates and is the cause of much indigestion, and moldy bread is thus alluded to by the London *Miller:* Some time ago, two persons out of eight who had eaten a portion of a bread pudding in a dining establishment at Bransley, died, and the deaths were naturally the subject of an inquest. Mr. A. H. Allen, a public analyst, testified that he had examined the liver and kidney of one of the victims, and the liver and lungs of the other, without finding any trace of poisonous metal. The material used in making the pudding had been carefully examined with negative results. The glaze of the basin in which the pudding was cooked had been found to be free from lead or other poisonous metals. The pudding had been very carefully examined and no deadly poison had been detected. The negative results of the chemical examinations for various metallic poisons had been borne out by the failure of either pudding to produce purging or other poisonous effects on a puppy which was fed on the suspected pudding for two whole days. There are not a few cases on record of irritant poisoning and death being produced by moldy bread. Thus, horses have been killed in a short space of time after eating such bread in their ordinary food. The symptoms were those of an irritant poison. In 1829, an investigation was made in France into the cause of illness due to eating bread, and it was found, by experiment, that bread in a particular state of moldiness or decay may not only produce symptoms of poisoning, but actually cause death; and it was impossible to distinguish the harmless from the dangerous kinds of mold. As fungi grow very rapidly, it is quite possible for moldy bread to be quite poisonous at one date and to have lost its poisonous properties two days afterwards. One of the most poisonous of these fungi is ergot, which produces symptoms very similar to those occasioned by the pudding, and the reports of the evidence in the present case have caused an eminent toxicologist to express a very strong opinion that the presence of this fungus was the cause of the poisoning. The witness stated further, that from experiments and observations he thought it clearly shown that the pudding contained a substance which resembled ergot in all its chemical reactions. The pudding was made of bread said to be moldy, and which was several weeks old and had been in contact with ham, butter and miscellaneous scraps. Mr. Allen then submitted extracts of letters from the leading toxicologists of the kingdom whom he consulted on the subject, and all of whom agreed with him in his opinions as set forth above.

Concerning the Memory.—The *Medical Press and Circular* gives some entertaining statistics of memory from M. Delaunay. The inferior races of mankind, such as negroes, the Chinese, etc., have more memory than those of a higher type of civilization. Primitive races which were unacquainted with the art of writing had a wonderful memory, and were for ages in the habit of handing down from one generation to another hymns as voluminous as the Bible. Prompters and professors of declamation know that women have more memory than men. French women will learn a foreign language quicker than their husbands. Youths have more memory than adults. It is well developed in children, attains its maximum about the fourteenth or fifteenth year, and then decreases. Feeble individuals of a lymphatic temperament have more memory than the strong. Students who obtain the prize for memory and recitation chiefly belong to the former class. Parisian students have also less memory than those who come from the provinces. At the *Ecole Normale* and other schools the pupils who have the best memory are not the most intelligent. The memory is more developed among the peasantry than among citizens, and among the clergy than among the laity. The memory remains intact in diseases of the left side of the brain, and is much affected in those of the right, from which it may be inferred that the right side is more the seat of this faculty than the left. From a physiological point of view memory is diminished by over-feeding, by physical exercise, and by education, in this sense, that the illiterate have potentially more memory than those who know how to read and write. We remember, moreover, better in the morning than in the evening, in the summer than in the winter, and better in warm than in cold climates.

Ventilating Bedrooms.—A simple device for ventilating bedrooms is within the reach of every one having an ordinary window in his room, by which fresh outer air can be admitted in small quantity with such an upward current as will prevent its being felt as an injurious draft by the inmates. It is particularly adapted to sleeping rooms when the weather is too cold to admit of an open window. Thus, start both top and bottom sashes of the window half an inch, which is not quite enough to clear the rebate or stop-beads at top and bottom, but which leaves an opening of an inch between the meeting rails, through which a current enters, but diverted upward by the glass as it should be, so as not to fall directly to the floor, as its coolness might otherwise induce it to do. It thus becomes well mixed with the air of the room without being felt as a draft.—*The Plumber.*

MINING AND SCIENTIFIC PRESS.

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The Week.

The week has been marked by an excellent rainfall and snowstorms, rendering certain an accumulation of water for mining purposes. Active preparations continue to be made toward utilizing the water supply, in the way of repairing and extending ditches and reservoirs. The demand of water will not very much exceed the supply required for extensive mining operations now either well underway or projected by substantial parties.

Missouri has been afflicted with a tornado in Randolph county, which destroyed human lives as well as houses, fences, grain, stock and trees. The most extraordinary occurrence, however, was the singular explosion in Oakland on last Tuesday night. The explosion was caused by an accumulation of gas in the main sewer on Jefferson street. It appears that the gas company have a large gas receiver at the foot of Jefferson street, and the supposition is that at high tide the gas was forced by the water into the branch sewers, and thence into the houses. Along Jefferson street, from Sixth street on the north and Second street on the south, the shock was the heaviest. At No. 806 Jefferson street, the front windows were shattered to atoms. The porch covering the rear portion of the house was knocked completely down, and the baseboards around all sides of the house were scattered in all directions. Inside of the house the mantels were broken, plaster cracked, and things mashed in general. The houses adjoining were similarly affected, but not as much. Between Fourth and Fifth streets, on the same street, the houses, from an outer appearance, looked as though they had been scorched. Those occupying some of the houses were so frightened after the explosion and shake-up, that they would not again retire. This morning hundreds of people flocked to the scene, and every mouth had a theory. Had it not been raining, it is probable that disastrous fires would have occurred. The explosion was simultaneous and accompanied by a sharp report and the tumbling of earth. It is said that the gas was ignited by some person entering an apartment filled with the escaping gas.

[Publishers' Notice.]

Annual Double Sheet Edition "Mining and Scientific Press."

December 20th, 1879.

On the above date we shall issue a Twenty-four page sheet of the PRESS, containing ably and carefully prepared articles on the mining progress of the past year and the outlook for the coming season; on inventions and scientific discoveries; on the advancement and present state of the mechanical arts, trades and home and foreign manufactures.

The opening Nos. of several important series of articles on mining and metallurgy will appear, with contributions from some of our best writers.

A large number of extra copies will be printed and mailed, postpaid, direct to representative miners, mechanics and to leading business and professional men and manufacturers, in San Francisco and throughout the Pacific States and Territories. The issue will be well illustrated, handsomely printed, and we trust prove a credit to the special industries it represents on the Pacific slope. Agents, news dealers and others desiring extra copies should send in their orders as early as practicable.

DEWEY & CO., Publishers.

November 28th, 1879.

German Metallurgists.

It is worthy of remark that Germany, the cradle of mining and metallurgical skill and science, by reason of her immense progressive strides, retains her prominence, and is to-day the home of that science needed in the advancement of this branch of industry.

If we study closely the cause of the success of German metallurgists, we will learn that it is owing to several advantages they possess, which are the result of many years' experience, associated with science and natural advantages. Although Karsten says "that the date of the commencement of mining in Saxony is not to be ascertained, nor is it to be determined where it first begun; that we only know with certainty that silver ore was mined in Saxony in the second half of the twelfth century, and reached a prosperous hight, through the immigration of Hartz'e minors, toward the end of that century." He says also "that the people who overturned the Roman Empire wandered to and settled in Bohemia, Moravia and Saxony in the seventh century, taking with them the art of prospecting for ore and the extraction of metals."

As mining in the Hartz dates from the ninth century, it is in all probability not so old as in Saxony. There is little or nothing extant from which we can discover the exact manner in which the mining and reducing operations were then conducted. Stella informs us "that in the first book on mining laws, which was written in Italy in the thirteenth century, there appeared numerous German technical phrases," which indicates that mining had then its principal seat in Germany. Agricola (1546) describes lead, silver and copper extracting processes which were conducted in a rude manner. We see that mining here has not so ancient an origin as in some other countries; but has been prosecuted with an almost untiring zeal and an energy well worthy of imitation.

This industry has been and is, fostered and protected by the different governments, not only through laws, subsidies and loans, but also by establishing and supporting educational institutes which are directly under governmental control.

Thus science and industry have been encouraged. By means of these well-regulated mining schools and academies a constant supply is maintained of educated men, who have been directly the cause of Germany retaining her position, and leading other nations with her many valuable improvements.

GOLD MINING IN CANADA.—A correspondent of the Quebec *Chronicle* writes as follows: The township of St. George, Beance, presents an appearance never before witnessed in this province. The Sir William Logan estate on Jersey Point, at the junction of the Riviere du Loup and the Chaudiere, is a scene of activity that promises well for the whole district; 120 men and 20 teams have been at work there for the last fortnight under the superintendence of an able mining engineer, and large machinery necessary for the operations has left here by the Quebec boat, which will astonish the population at the mines; they having been satisfied for years to pick up the gold out of the rivers whilst at low water. Other parts of the country are also making a stir, and gold is found and sold daily in various parts.

Classification of Smelting Ores.

At no other metallurgical establishment in the world are to be found so many and various ores for treatment as at the Royal Saxon Metallurgical Works in Freiberg. Almost all known metals are to be found in the ores there treated. The metallurgical processes of Freiberg have for their main object the production of silver, gold, lead, bismuth, zinc, copper, vitriol, etc. In addition to the ores delivered by the Saxon mines in and about Freiberg, foreign and domestic ores are purchased and treated, and also sweeping, or dross, containing silver, lead, copper or gold. The sulphur present, in large quantities in the greater part of the ores, is made use of as much as possible for the manufacture of sulphuric acid; some of the ores carry also a large percentage of arsenic. This is also treated to advantage in the manufacture of various arsenical products, such as arsenious acid, orpiment and metallic arsenic. The silver in the Freiberg ores is more or less finely distributed throughout the ore in the form of silver-glance, stephanite, tetrahedrite, polybasite and native silver. The lead occurs almost exclusively as galena. The copper occurs as copper pyrites, tetrahedrite, variegated copper ore and copper-glance. The greater part of the ores contain, beside these metals, unpayable quantities of gold, bismuth, cobalt and nickel. The gangue is composed principally of calcite, hitter-spar, fluorite, baryta and quartz.

All the ores delivered at the smelting works are divided into two classes—payable and non-payable. To the first class belong all those which contain over a specified amount of metal, and to the second class all those which do not reach this amount. To the non-paying ores belong: Dry silver ores containing from .01% to .04%; copper ores not containing 4½% of silver and copper together; lead ores not carrying more than 15% of lead; and nickel and cobalt ores.

All the ores are classified, according to their composition, into nine classes, which are enumerated by Mr. H. Painter, one of the U. S. Commissioners to the Vienna exhibition, as follows: 1, lead ores—*a*, plumbiferous ores, *b*, galenas; 2, copper ores; 3, arsenical ores; 4, zinc ores; 5, sulphur ores; 6, pyritous silver ores; 7, quartzose pyritous ores; 8, quartzose dry silver ores; 9, spathic dry silver ores. The lead ores are all argentiferous, and comprise about half of the ores delivered at the works. They are classified into plumbiferous ores and galenas. Those containing between 15% and 20% lead belong to the first class, and those containing over 30% lead are reckoned in the second class (galenas.) The average percentage of lead contained in all the plumbiferous and galena ores amounts to 40%, and the silver to .15% = 43 ozs., 33 dwt., 14.40 grs. The copper ores are almost always argentiferous, and contain from 1% to 10% copper, with a general average of 3% at the highest.

The delivery of copper ores from the Freiberg mines is, comparatively speaking, very small, but at times rich foreign ores are bought. The arsenical ores contain from 10% to 40% arsenic, viz: *a*, arsenical ores averaging 35% arsenic; *b*, arsenical pyrites, averaging 15% arsenic and 25% sulphur; *c*, arsenical lead ores, averaging 13% arsenic and 18% to 20% lead. They are delivered over to the arsenic works.

The zinc ores, principally composed of zinc-blende, contain from 30 to 40% zinc. Lead ores carrying less than 30% zinc are classed with the plumbiferous ores, and are turned over to the zinc works for treatment. All the zinc ores carry more or less silver. All Freiberg ores that contain 20% and more of sulphur are classed with sulphur ores. Pyritous silver ores are such as are rich in silver and sulphur, and when they contain .20% silver and more the sulphur is not paid for. They do not contain more than 1% copper, or 15% zinc.

The quartzose silver ores are poor in silver and carry a very large percentage of silicic acid. By dry ores, in general, is understood all such argentiferous ores as do not contain lead and copper in payable amounts. By quartzose dry silver ores is to be understood all such as are principally composed of quartz, and contain only so much pyrites that they are not capable of producing 20% of raw matte by smelting. The spathic dry silver ores are only distinguishable from the quartzose therein by the associated gangue, being of a spathic instead of silicious native. The classification of ores may be simplified as follows:

1. Lead ores—*a*, plumbiferous ores, with 15% to 29% lead; *b*, galena, with more than 30% lead.
2. Pyrites, chiefly iron pyrites, containing not more than 15% zinc and very little arsenic.
3. Pyritiferous ores, with 15% to 30% zinc.
4. Blende, with more than 30% zinc.
5. Arsenical ores, averaging 35% of arsenic.
6. Arsenical pyrites, with 18% arsenic and 26% to 28% sulphur.
7. Arsenical lead ores, with 12% arsenic and 18% to 20% lead.

The ores are also divided into stamped, jigged and washed ores, corresponding to the manner in which they are dressed at the mine. Taken as a whole, they are called "slime" ores. The distinction of "lump ore" is also made; meaning ore in pieces about the size of a walnut.

SIR WILLIAM BOXALL, the eminent English painter, is dead.

The Mining Industry and the U. S. Geological Survey.

Now that the different geological surveys are consolidated under one head, with Clarence King in charge, the predilection of that gentleman in favor of practical mining matters will cause more attention to be paid to metallurgical processes, etc., than heretofore. The different surveys have done excellent work in their departments—work appreciated at home and abroad; but as far as the mining industry is concerned, the results have been only general in their nature and related more to general geology than to details of mining matters.

A main object of the United States Geological Survey is to advance the knowledge and practice of the mining arts, by investigation and description of the occurrences of ores, of the methods employed in mining them, and of the processes by which they are treated. We are assured that now every mining district will receive the attention of the survey. The information obtained and the results of special investigations, will be so presented as to afford a trustworthy record of the mineral character of the country and of its resources, and of the methods of manipulation which have proved most suitable under varying local conditions. Each district will therefore receive the benefit, not only of the survey within its limits, but of the collective experience of the whole country. Among other things, the U. S. Geological Survey has been intrusted with the task of gathering statistics for the next census. Raphael Pumpelly is Chief of the Division of Mining Geology, and expert special agent of the census, which is sufficient indication that complete and valuable statistics will be compiled. It is presumed that a list of the quartz mills, roasting and smelting furnaces, quicksilver reduction works, etc., will be made up, and such other information as will be useful to all connected with the mining industry.

Prof. G. F. Becker, formerly of the University of California, is geologist in charge of the San Francisco office, and he is already pursuing the task of collecting mining information for the Survey Reports. Full descriptions of our various metallurgical processes, with the appliances connected with them, is sadly needed; but until now all hops of getting such information, officially, has been abandoned since our State Geological Survey came to an untimely end.

Altogether, we feel certain that the proposed work of the United States Geological Survey will be of great practical use to the mining community. It is only hoped that the publications will be distributed more liberally than has heretofore been the case with the Government reports relating to mining matters.

AUSTRALIAN GOLD MINES.—Reports from the several mining districts in the colony of Victoria give very encouraging accounts of operations there. The improved prospects of some of the large gold-bearing mines of Sandhurst have given renewed hopes to the miners, mine owners and business people of the district. A striking instance of the good luck which occasionally falls to individual miners was shown in the month of September in the case of four men who were working the St. Mungo claim, Sandhurst, and paying the owners of the mine a certain percentage on the gold obtained for the use of the mine. These men, in a drive at a distance of about 60 feet from the surface, came upon a rich spur of quartz, from the first ton of which they obtained the extraordinary result of 255 ounces of gold. Two loads crushed shortly afterwards gave 191 ounces, and 10 tons from a lower level yielded 50 ounces, making altogether 496 ounces of gold from 13 tons of quartz. Out of that the fortunate four divided £1,400, beside paying £500 tribute to the proprietors of the mine. A week later they had another surprising yield of 255 ounces of gold from two tons of quartz, and an equal quantity of debris from the floor of the drive. At the alluvial diggings at the Whipstick, a place near Sandhurst, a nugget of gold weighing 40 ounces was found by a lucky digger six inches below the surface of the ground. The finder, for obvious reasons, declined to state the locality where he obtained the nugget.

CORNSTALK AND SORGHUM SUGARS.—According to all reports, the sorghum sugar interest of the prairie States is wheeling ahead in a most lively manner. The Commissioner of Agriculture states that the making of sugar from the juice of the amber cane is a complete success. At a sugar manufactory 50 miles north from Chicago, the Commissioner reports a shipment of a carload of most excellent sugar, October 23d, with other carloads to follow. More than this, the Commissioner is enthusiastic over his cornstalk sugar experiments, and promises that with sorghum and stalks the "great West" will soon be flooding the saccharine markets of the world. We hope so.

THERE are now 25 soldiers and 25 Apache scouts at Fort Cummings, New Mexico. The road to the Mimbres is being constantly patrolled, and no party of hostiles could pass up from the south without being discovered.

Immense Mining Machinery.

The Pumping Engine for the Sierra Nevada, Mexican and Union Shaft.

Prescott, Scott & Co., of the Union Iron Works, have just completed ready for shipment another one of the elaborate and massive pieces of mining machinery for which this firm are becoming famous. This is the new pumping engine for the joint shaft of the Sierra Nevada, Mexican and Union mining companies, on the Comstock. The engine is of a unique type, and the first one of the kind ever built on this coast. The details are from designs by Wm. H. Patton, consulting engineer for the companies mentioned. An idea of the magnitude of the machinery will be gained from the statement that it weighs in the aggregate about 1,200 tons.

It is a direct acting compound hoisting engine, and the two cylinders are upright, and placed at an incline towards each other. The initial cylinder is 65 inches in diameter, with 6 foot 9 inch stroke; and the other cylinder is 100 inches in diameter, by 8 foot 3 inch stroke. The jackets are cast in sections; the liners in one piece. The largest pumping engines on the Comstock before this were: That on the Chollar-Norcross-Savage shaft, the cylinders of which were respectively 32 and 65 inches in diameter and 10 foot stroke; and that of the Yellow Jacket with cylinders 33 and 65 inches in diameter and 12 foot stroke. The smaller of the cylinders of this engine is as large as the largest of the others.

The larger of these cylinders weighs alone 43 tons, and the smaller one 30 tons. The sole plates for the cylinders weigh 23 tons each. The pistons are 16 inches thick. The piston rods are of different lengths fitted with glands with adjustable gearing and lantern brasses. The engine will run about eight strokes a minute.

The engine sets 18 feet between centers, and is fitted with Eugene O'Neill's improved valve motion, all the valve gear coming in between the cylinders in a very compact form.

The initial valve chest is placed between the cylinders down close to the base, on the side where the engineer stands, and serves to join the cylinders at the bottom. The expansion steam chest is placed on the opposite side at the top of the cylinders. The connection from throttle leads across the top and down the opposite side of cylinders to where the engineer stands.

The fly-wheel sets back of the engine, and revolves on a shaft 27 inches in diameter. This fly-wheel is an immense piece of construction in itself, weighing 110 tons. It is 37½ feet in diameter, and was cast in 12 sections. The center or hub of this wheel alone weighs 15 tons, and pillow blocks 5 tons each. The fly-wheel shaft is connected with two wrought-iron cranks. The engine crank is 6 feet between centers and weighs 9 tons. On the opposite end of the shaft is the crank for the air pump and condenser. This is 3 feet between centers and weighs 6 tons. The connection from the main engine crank to the pump bob or beam is by an immense rod 24 feet between centers.

This big pump bob or beam works in a deep pit or chamber dug out of the ground and is below the engines. The center of the beam is 21 feet 6 inches below the foundation of the engine.

The pump bob is made in sections, of armor plate, flanged and ribbed for strength. The castings connected with the beam to hold the truss, weigh, on each side, 10 tons. The beam is 48 feet between centers, with a double truss running clear around it. The shaft on which this beam oscillates is 22 inches in diameter. The sole plates for the journals of the pump bob are 17 feet long, 28 inches wide and 6 inches thick. The pillow blocks are 18 inches diameter in bore and 28 inches long.

The initial cylinder piston rod link takes hold of the beam at the end where the pump rod is connected, and the link of the other rod at the other end. The bob is journaled a little at one side of the center on account of the preponderence of weight at one end, which accounts for the difference in length of stroke of the two cylinders working at opposite ends of the same beam. The slides of the engine are connected to the coping stone in the pit by immense bolts built in the stone. The link connections from cross-heads to beam are 13 feet 3 inches between centers.

The air pump and condenser are on the right hand side of the engine in a vertical position. The air pump is 4 feet 6 inches in diameter, 6-foot stroke. The condenser is 4 feet 9 inches in diameter. The exhaust pipe from condenser to engine is 20 inches. The condensers and air pump are so constructed as to have a cast-iron casing all around, water-sealed, so when in position they are completely covered up. This casing is 14 feet 5 inches high by 13 feet 6½ inches long, and 6 feet 6½ inches wide.

The connection from the bob to pump rod is by two immense wrought-iron straps, gibs and keys. It is intended to handle a line of pumps 3,000 feet.

The pump rod is made of timbers 18 inches square, with 40 pieces of strap plates, each 33 feet long, 10 inches wide and 1 inch thick, bolted with 1¼-inch bolts.

There are six balance bobs on the shaft, placed 200 feet apart and arranged to handle 14 14-inch plunger pumps and a 20-inch lift pump at the bottom. This sump pump is 24 feet long. The column pipe to the lift pump is 22 inches in diameter, made of lap-welded tube, and is the largest ever manufactured for pump use.

To run this engine there are four 54-inch boilers, 16 feet long.

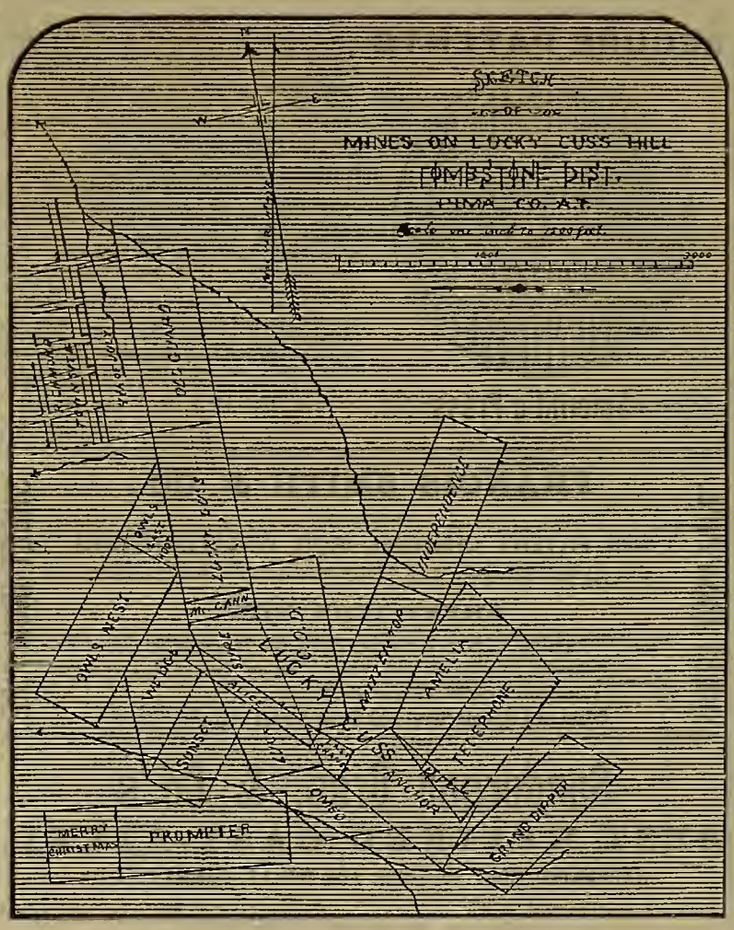
Arizona—No. 6.

[Written for the PRESS by W. H. S.]

Lucky Cuss Hill, Tombstone District.

Lucky Cuss Hill, where the famous mine of the same name is situated, is about a mile and a half from the thriving town of Tombstone, in a westerly direction, and is the center of a group of rich mines and mining prospects. The Lucky Cuss mine, from which the hill derives its name, is situated on one of its northern spurs, and has five shafts sunk, No. 2, the deepest one, is down 230 feet. One tunnel has been run into the hill about 200 feet, and four or five drifts run on the different levels, of an aggregate length of four or five hundred feet.

This company has some seven or eight hundred tons of ore on the dump, rich in chloride, carbonate and horn silver. The company is erecting a 15-stamp mill at Charleston, about ten miles west from the mine on the San Pedro river, where they get plenty of water. The mill is to be called the Corbin mill, after the efficient manager of this property, who brings with him to this enterprise a large and successful Eastern business experience. The location of the mill at this distance from the mine, as in case of the Gird and Contention mills, is for the purpose of getting an adequate supply of water, which cannot be done at the mines with their present facilities.



Anchor Mine.

This mine lies just over the hill from the Lucky Cuss, and has a ledge eight feet in width at the shaft. Very rich in chlorides and horn silver. The horn silver, in some specimens, is very handsome, appearing in small bunches or clusters, resembling somewhat fine wire or spun silver. Much brown spar is found, discolored by iron stains. This carries gold as high as $12 per ton. The assays which have been made from this mine run from $125 to $1,000 per ton. The direction of the ledge is about southeast and northwest. The vein has a dip of 80° north, and is in porphyry walls capped in lime. Mr. John Haley, of Tombstone, was the discoverer and locator of this mine. He is an old prospector and miner, and knows a good thing in that line when he sees it. S. M. Allis, Esq., Deputy Mineral Surveyor of Tucson, is associated with Mr. Haley in the ownership of this property, including the Allis and Last Chance, which seem to be a prolongation of the Anchor ledge.

Among the other mines of this group, attracting attention and showing more or less development, may be mentioned the Telephone and C. O. D., owned by J. Murray Bailey, both in rich ore with a promising future. The Grand Dipper has a shaft down 60 feet, disclosing a body of high-grade ore, rich in chlorides and horn silver. The popular Sheriff of Pima county, Shibell, is one of the lucky owners in this bonanza.

The Sunset, recently bonded by B. Frank Hall, of Philadelphia, has a shaft of 14 feet in rich ore, and the Mizzen Top, owned by Postmaster Harwood of Tombstone, has a 20-foot shaft showing a fine body of ore. The Prompter, owned by Col. Lewis of the Richmond water works, although, strictly speaking, not on this hill, as it lies across a ravine, is deserving of notice from the strong character of its croppings and the great width of its ledge, which is from 10 to 20 feet in porphyritic walls. Two shafts have been sunk, one 25 the other 15 feet, both in the ore body the full width of the shafts, showing chlorides and black sulphurets of silver. The ore assays high and there seems to be plenty of it. The new city of Tombstone, its rapid growth and representative business men, and the other important mining interests centering there, will be commented upon in future articles. The group of mines about the Lucky Cuss are now touched upon because they have been more particularly examined. The map or sketch will sufficiently indicate the location of these mines with reference to each other. The mountains of southern Arizona are full of rich mineral deposits and the principal want now is, men of capital to convert these deposits into bullion. Of men without money, there are enough here already until further developments are made and more machinery put at work.

MANNA IN WASHINGTON TERRITORY.—This is not the manna upon which the Israelites fed in the wilderness, but a substance valuable to the pharmacist and sometimes called fir sugar. It is a cream-colored flaky substance with a sweetish taste, containing mannite, which has a mild laxative effect upon the system. It is the concreted juice of a tree, and the supply now comes wholly from Sicily, being derived from a small native tree, *Fraxinus ornus*. A sample of manna was lately sent from Yakima, W. T., to the Smithsonian Institution at Washington, and referred to the Department of Agriculture for analysis. It is reported to be an excellent article. It occurs as an exudation upon the branches of a species of fir tree and is said to be in such quantities as to break down the branches. It will also doubtless break down the manna market unless some enterprising man should start a manna pill factory or a manna cake bakery. We will accept a royalty of one per cent. on the profits as a recompense for this suggestion.

THE *Ethiopia*, from New York November 22d for Glasgow, and the bark *Geflon*, from Hamburg for Philadelphia, have been damaged by collision, the former in the Clyde and the latter at Cruxhaven.

Threading the Continent.

The return of the sunshine of prosperity to Eastern fields and manufacturing interests is calling capital from its hibernation and warming it up for a season of activity and enterprise which we trust may be long and satisfactory. The era of magnificent enterprises which followed the war bids fair to be eclipsed by the decade which will soon open. There is reason to believe that this will be the case, because the era which culminated in 1873 was one of great inflation and grand ideas, which were but partially borne out by the logic of facts. Hence the decline and fall. We seem now to be entering a period in which sounder views will prevail; in which courage will be duly tempered with caution; in which there will be liberal expenditure no doubt, but upon a better basis of practicality and durability.

The latest advices from the eastern financial centers bring news of unusual activity in railroad enterprises. It is true that there is noticeable a most grasping spirit of monopoly, and most eager efforts to turn the tide of prosperity into certain channels for the aggrandizement of the few, but these endeavors are met by counter movements which bid fair to guard the public interest and turn the designs into schemes which will benefit the whole country. This is the present aspect of the several railroad enterprises which are now racing across the continent. Jay Gould who is reported to have done his best to control the possible approaches to our coast from the East, is now said to have been met and beaten by the Atchison, Topeka and Santa Fe corporation. This company now claims to have secured three approaches to the Pacific coast—one a new line along the 35th parallel due west to Los Angeles, and thence north to San Francisco; another to connect with the present Southern Pacific road, and another to disport into Mexico and strike the Pacific ocean at Guaymas. This is the present announcement of the matter, and work is said to be underway toward such results. Certainly there has never been a time when enterprises seemed easier to prosecute, and there is no lack of capital to carry them into effect. Then, to the north of the existing road, there is the old-time Northern Pacific enterprise, being infused with new life by the return of prosperity, and by the astonishing development of the agricultural interest along our northern boundary.

The question arises whether all these enterprises can prove enduring, and whether they are called for by the growth of the country. It seems clear enough that they are all more feasible than the existing line appeared at its inception. Each of the proposed lines has a far better show of developing local traffic and fostering the growth of the great interior of the continent. For it is fast being demonstrated that the great interior States and Territories are not nearly so worthless as they were once supposed. Agriculture is gaining a permanent hold upon areas which have been regarded as deserts, and mineral resources are being developed where the rocks were counted worthless. This changed view of the vast interior which is forced upon the outside world by the growth of the new States and Territories, is enlisting abundant capital in threading them with new avenues of transportation, and the result is that the country is advancing so rapidly that all former estimates of our national wealth and productive area must be revised and extended. Two or three years ago the man who foretold the present tendency of affairs would have been laughed at as a visionary, for it was then thought that the improvements had so outgrown the demand for them, that it would require a generation to heal the breach. It is a gratifying thought for the close of the decade that the fact seems far otherwise.

The grand producing interests of California must be greatly stimulated by the new lines of transportation to Eastern markets which are now promised. It seems indisputable that between the several enterprises there will prevail a spirit of wholesome competition which will reduce the cost of carriage to a fair figure and thus will incite the development of industries in this State which now are unprofitable. There will also be a considerable reduction of time occupied in transit, which will be a great item in the movement of our perishable products. The approach of through lines to the different parts of the State, should make our growth more symmetrical and encourage many whose present distance from centers is very depressing.

There seems every reason to look hopefully upon the new movements. The relation of railroads to the people is becoming better defined and understood, and the introduction of a "live and let-live principle" seems assured. The force of competition which will creep into the situation and the regulative action which we must hope our new railway commission will exert certainly should give us confidence for the future. It does not appear that any of the coming enterprises propose to place burdens upon the people, except such as may be voluntarily assumed; and if this be their plan, and their work be to draw California still more closely into the sisterhood of States, and her peerless products nearer to the markets which await them, surely we can all speed their progress and welcome their approach.

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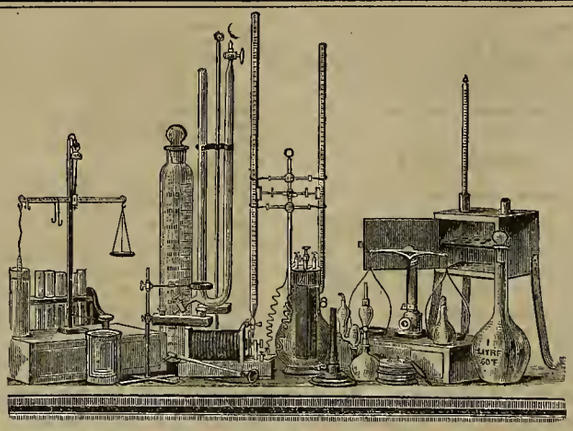

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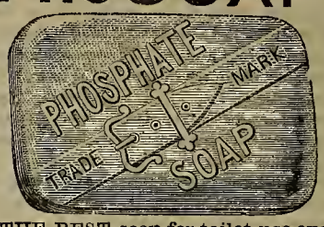

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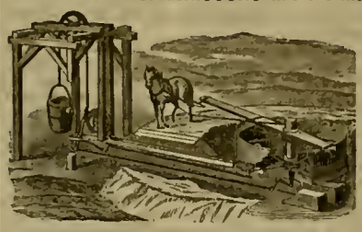

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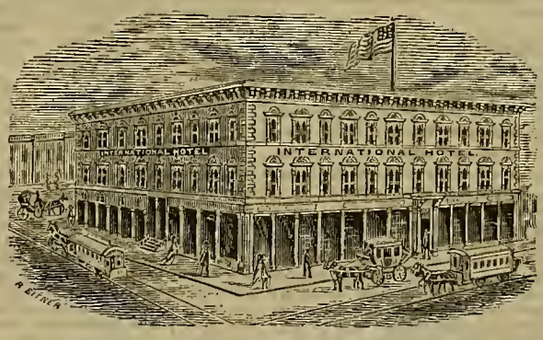

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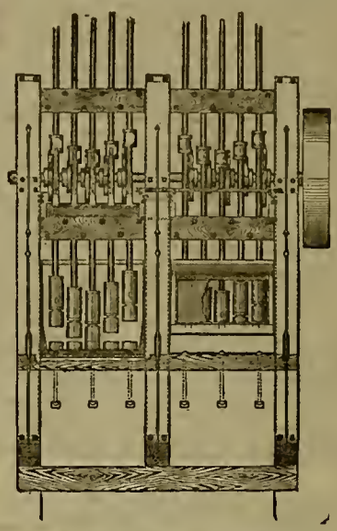

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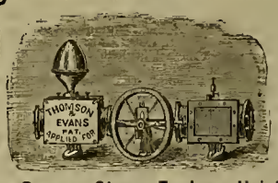

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CONTINUED FROM PAGE 373.

ARIVACA.—The Longavina is being drifted upon from the bottom of a 100-ft shaft, in a fine ore body which yields from $200 to $400 in silver. The Russians mine, Sonora, is delivering ore to the Arivaca mill, 15 tons per trip; ore carrying both gold and silver. The Liberty mine has steam hoisting works completed and is raising with the same. At 70 ft depth they have three ft of high-grade mineral. The steam hoisting works of the Con. Arizona are up and at work. This mine has developed one of the finest ore bodies in the district. Mr. Fairbrother, of Stockton, Cal., is pushing work on the Reading mine, near Cerro Colorado. He has a good mineral showing. A new strike has been made near the Captain Jenks mine, which runs high in silver.

CAVE CREEK.—It is said by Tucson parties that a rich and extensive discovery of mineral has been made in Cave Creek canyon, in the south end of the Huachuca mountains. The locality takes its name from subterranean cavities which have heretofore been supposed to be natural caves, but recent exploration show that they are chambers in vast deposits of silver-bearing ore, from which at some time immense amounts of the precious metal must have been taken. These ancient workers, propably the early padres, reduced the ores at furnaces about 16 miles south of the mines, and between which points plainly-marked trails still exist. The magnitude of these furnaces is plainly indicated by the extensive ruins. The mines were recently re-discovered by a party of prospectors, among them C. F. McConkey and W. W. McCalley, who have secured five claims, lying parallel, including two of the caves, and upon almost any portion of which rich mineral can be uncovered. A gentleman who visited these claims informs the *Weekly Nugget*, the best way to express it is, "One hundred and sixty acres of solid mineral." A correspondent writing to the same paper says that the mountain on which are the most valuable mines as yet discovered is of lime, with iron croppings, and under these croppings, at not more than six inches, is the mineral. For a distance of 3,000 ft up the mountain, and 4,000 on the side there is no change in the formation, and in each place where a prospect hole has been sunk, the mineral shows, consisting of galena, sulphates, chlorides, a slight trace of sulphur and horn silver. There are 10 claims located on the mountain and each mine is a bonanza in itself. Assays run from $60 to $400 as far as has been tested. The nearest way to get to this canyon from Tombstone, is up Ramsey's canyon, down the head of Bear gulch and from there over the dividing range into the west fork of Cave Creek canyon, or up Ash creek, which leads directly to the east fork of the canyon. The nearest way for wagons is around the south end of the mountains a short distance into Mexico, where you strike a wagon road passing within three miles of it.

COLORADO.

SILVER CLIFF.—*Prospector*, Dec. 2: The Garnet, Buffalo and Ruby lodes situated in the chloride belt show mineral in generous supply running from 22 to 35 ounces in silver.

THE DIAMOND.—This is a new mine which is being developed by Messrs. French & Gillam. At a depth of two ft below the surface they find a rock containing horn silver.

THE LITTLE ED.—Mr. Cox, who has just returned from a visit to some of the mines around Rosita, says that the Little Ed is among the mines in that section which are now giving promise. This mine adjoins the Silver Horn, which has recently developed so richly, and of which we have had occasion to speak. A shaft is now being opened, and at a depth of 15 ft a fissure vein is found revealing chlorides in trachyte, porphyry in a calcined and decomposed state, the oxide of iron and psilomelane, the binoxide of manganese. It is thought at the proper depth the same body of ore will be met as in the Silver Horn.

SILVER HORN.—Report from the Silver Horn mine comes in again to the effect that a surface crosscut of 30 ft from five to seven ft deep has shown several new veins dipping towards the main vein, bearing good ore and bidding fair to be as good as the first rich vein. Six assays made Saturday displayed the following results. They were of ores taken from the different new veins: 1,430, 1,012, 104, 106, 71, 27, average, 453½.

DELMONT.—In the Delmont lode, contiguous to the Ben Franklin, the owners, Messrs. Coombs, Alden & Co., have found richness in the new shaft, the last one of the three along the vein. The walls of the vein strike ore of white porphyry, with a uniform width of six ft, showing a continuous lead.

VANDERBILT.—The richest body of horn silver yet discovered in the camp was brought to light yesterday. This new strike was made in the Vanderbilt, situated in the horn silver belt north of town and alongside of the Buckeye. The deposit of horn silver is one-quarter to one-half an inch thick, and can be removed from the rock on which it lies, with the pick.

IDAHO.

YANKEE FORK.—*Herald*, Nov. 29: We learn from Mr. Fred Phillips that rich quartz mines have been struck on Deep creek, a country very little prospected, and lying about 35 miles westerly from Salmon City. The Yuba tunnel has tapped the Atlanta lode at a depth of 1,500 ft and struck a body of rich ore. The tunnel is 1,400 ft long and situated near Atlanta. The furnaces are in operation again at South Mountain, and the Mono and other mines are yielding good rock.

MONTANA.

BOULDER DISTRICT.—Butte *Miner*, Dec. 2: Mr. R. G. Abernethy, of this city, returned last evening from a visit to the Boulder district, bringing with him several very fine specimens of silver quartz, obtained from a prospect opened by the Silver Glance mining company, composed of Messrs. Abernethy, Smith & Hull. Mr. Abernethy speaks in very flattering terms of the future prospects of the Boulder district as a mining camp, and reports that a number of equally promising veins have lately been discovered, and that men of capital have lately paid visits to the district with a view to making investments in some leading property. The specimens which the fortunate owner of the Silver Glance showed us, assay as high as $200 to the ton in silver.

GLENDALE.—Recent reports from Glendale are of a very encouraging and satisfactory nature. We have received positive assurances from the highest authority that there are no doubts as to the consummation of the Hecla sale. The terms of the transfer are the payment of $1,600,000, the parties disposing of the property to take some stock of the new company. The ore and bullion on the dumps and at the smelter, to the value of $500,000, are to be retained by the present owners of the property.

THE STEPHENS LODE.—This very promising property is owned by Mr. John Stinson, who has leased the mine to S. J. Stewart, under whose energetic management work is now being prosecuted. From the bottom of a 50-ft shaft a level 80 ft long has been run to the west, striking a three-ft vein of free-milling ore, the assay value of which is in the neighborhood of $60 per ton in silver. The daily product is about four tons, which is shipped for reduction to the Dexter mill. Fifty tons of good ore are now on the dump.

OREGON.

ITEM.—Jacksonville *Sentinel*, Dec. 3: Messrs. Watts & Redman, on Horse creek, in Josephine county, discovered what they believe to be a rich quartz ledge. The specimens of quartz found are highly impregnated with the precious ore. Having made the necessary arrangements they will at once wash off the top dirt in order to lay bare the ledge. The indications are all favorable for a rich strike.

UTAH.

ROMULUS STRIKE.—The Silver Reef *Miner*, published in Washington county, Utah, says: The recent strike made by Edward Loughney and partners, in the Romulus mine, on Grapevine Wash, has been the subject of much comment during the past week. Everybody agrees, however, that the strike is a good thing for the camp as well as for the lucky owners of the claim. Mr. Loughney informs us that the ore vein shows up bigger and richer with every stroke of the pick, and he is confident that he has got a bonanza within the boundary lines of his claim. The last two assays made of average rock showed $32.96 and $121.27 per ton. Since the above was put in type, three more assays have been made from unpicked samples, showing $294.13, $143 and $52 to the ton.

WASHINGTON.

QUARTZ LEDGE.—The *Astorian* says: A very valuable quartz ledge, containing gold, silver and lead, has been discovered recently near Columbia Center, Columbia county, Washington Territory, by John Decras.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of special mention:

APPARATUS FOR GUIDING HEADERS.—Joshua Steves, Stockton, Cal. Patented Dec. 2d, 1879. No. 220,210. In ordinary headers, at the rear end of the beam or pole, is placed a vertical post, to which is attached, by means of pins or staples, the upright, on the lower end of which is the caster wheel, supporting the rear end of said pole. At the upper end of this upright is a horizontal tiller or guiding bar, for turning the wheel so as to direct the machine in a straight line or turn it around. The driver usually stands on a board on the pole, so that the tiller comes between his legs, and then he can operate the tiller by the movements of his body, and use his hands in moving the levers controlling the cutters. It happens frequently that in turning sharp corners or curves the driver will have to push the tiller way off to one side, and at the same time have to stop to operate the lever, both operations being difficult to do at once. The tiller is then so far off to one side, and has to be held there, that the man must lean over to that side to manage it, and at the same time operate the lever. Moreover, with the tiller made and worked in this way, the driver cannot sit, but must at all times stand up. The inventor has devised a means of guiding the header by which the driver may sit and operate the lever and tiller at once without any inconveniences. This invention will be found a great improvement in guiding headers, since it overcomes one of the most serious difficulties in this class of agricultural implements.

CAM FOR STAMP MILLS.—Lewis A. Moore and John Dykes, Orena, Humboldt Co., Nevada. Patented Nov. 18th, 1879. No. 221,738. This invention relates to certain improvements in the construction of cams, which are commonly used in lifting the stems and stamps of quartz mills by means of the tappets; and consists in forming a removable shoe or face attached to the body of the cam by means of bolts, and placing between said body and shoe a cushion or packing of any elastic substance that will yield or spring under the blow of the cam on the tappets, so as to reduce the jar attendant on the sudden contact.

NEW AUSTRALIAN RAILWAY.—A railway recently undertaken over the Mount Lofty range of hills, South Australia, will in years to come be regarded as one of the greatest engineering works at the Antipodes. However insignificant gradients of 1 in 45, and ascents of 2,000 feet may now be, anyone who travels on the future line, or inspects the earthworks and tunnels as they are now being made, cannot fail to regard the line as a bold step for a small community to take. Nearly £750,000 will be spent on the 33 miles between Adelaide and Nairne. Within a trifle the railway is estimated to cost £22,000 per mile, and that, too, through a country where the cost of the land is a mere bagatelle. In some parts the expenditure will be fully £30,000 per mile, owing to the large amount of tunneling to be done, and the hight of the viaducts and embankments to be formed. The summit of the range will be reached in 18¾ miles from Adelaide, at a point about a mile to the west of Chafers, and at an altitude of 1,630 feet above sea level. Here a station, to be named after the range, the Mount Lofty station, will be built. The ruling gradient, 1 in 45, will be between Government Farm and this point, and the descent from the summit to the Aldgate pump will be by a similar gradient. Powerful engines will have to be used, and they will come down to Mitcham without the aid of steam. The mountain section begins about Mitcham, and with but small exceptions the gradient is 1 in 50 until the Government Farm is approached. But in order to secure even this gradient, creeks have to be crossed, steep hillsides bugged, mountains tunneled, sharp curves made, and ravines spanned by viaducts of great hight.—*Scientific American.*

INTERMITTENT PHYLLOXERA.—It seems that the vine pest in Australia is manifesting some of the hesitating behavior which characterizes it in this State, and not proceeding forthwith to "occupy the land" as in France. The government inspectors of Victoria report that the insect has not been detected outside of the Geelong district, also that the ravages of the insect have been much less virulent this season than last, which fact strengthens the hope that the disease may be yet successfully stamped out.

Classification of Metalliferous Veins.

A very interesting paper from Melville Attwood, Esq., was read before the San Francisco Microscopical Society on December 4th. The subject of the paper was "The Importance of a Classification of Metalliferous Veins." In substance Mr. Attwood says: Of all the speculative employments, mining is, perhaps, the most uncertain. Miners of great experience and ingenuity are frequently at fault, and sometimes completely defeated in their search after paying ore-bodies and the mines abandoned, while men of less ability have afterward worked the same mines, from which they have derived large profits—so that any plan or method that tends to throw light on the subject, and assist the miner in his explorations, should be considered of value.

The proper classification of metalliferous veins or lodes (I prefer the Anglo-Saxon word, lode,) appears to me to be one of the first things required, and it seems surprising that, where such vast interests are at stake, it should have been so totally neglected.

As far as I am able to judge, the only way in which lodes can be correctly classified is by their enclosing rocks or the rock formation in which they occur, thus rendering an accurate determination of the enclosing rocks necessary. Some rocks are of a coarse and simple structure, and their mineral constituents may be resolved by the unaided eye, but by far the greater number are of so fine-grained texture as to defy ocular analysis, so that for their determination the use of the microscope is indispensable. For instance, totally different rocks sometimes have the same chemical composition and are similar in external appearance, but a microscopic examination shows the internal structure to differ greatly. A classification of lodes would do much to stop the misuse and confusion of common mining terms, and many hackneyed phrases, such as "regular and well defined walls," "clay walls;" "true fissure veins," "perfect formation," etc., would be abandoned. Some of the most productive tin loads in England have no walls, and the vein-stone appears to be an altered granite. Again, the richest mine in Nevada—the Comstock lode—has only one, the footwell, the rock a dolerite. The principal gold lodes of California—the Eureka and Idaho, of Grass Valley, the Amador, of Sutter Creek, and others—can only be said to have a "hanging wall," the rock of which is generally a diorite or diabase, the latter being considered the ancient form of dolerite; so that "regular and well-defined walls" are not so good an indication of mineral wealth as is generally supposed.

Last year I had the pleasure of calling your attention to a simple mode of preparing rocks for examination of the *outer* surfaces with the assistance of a common pocket magnifier, and which I then thought would be of great assistance to the miner, in helping him to correctly determine the character of many of the enclosing rocks, and in many instances it was quite sufficient; but for a *correct* determination, after all, the microscope must be used, and at that time a cheap and easy way to cut the rock-sections was the difficulty I had to contend with. After many experiments, I found a simple plan by which it can be done at little cost and labor, by the use of a few emery stones, or blocks of different degrees of fineness—say, from one and a half to two inches square, and eight or nine inches long—the same as I have brought here for your inspection. The chips to be cut should be first made as thin as possible; the plan recommended by Mr. Rutley, to use a cold-chisel, the end let into a block of wood, and then by holding the specimen on the edge of the chisel, and striking it a sharp blow with a light hammer, will generally give you a satisfactory chip. The chip must then be rubbed on the emery blocks, with water, till you get a good, even surface on one side of it, commencing with the coarse emery blocks first; then, with Canada balsam, fasten the smooth surface of the chip to a common glass slide, which is done by heating the slide over a spirit lamp, and then applying a small quantity of the balsam. As soon as the balsam liquefies, press the smooth surface of the chip into it, and then allow it to cool. The balsam is better to be dried, so that you can use it like a stick of sealing wax. As soon as the slide and chip are cold, you can commence to rub the outer or rough surface of the chip attached to the slide, on the emery blocks until you get it nearly thin enough for mounting. To finish, use the fine, smaller blocks as you would a file. You can hold the section up to the light and examine it during the operation. Mount and cover the section with thin glass, in the usual way.

Amongst the specimens in the case which I have brought for your examination are two marked Nos. 1 and 2, which were cut in London, England, by a professional, with expensive apparatus. Those marked Nos. 3 and 4 are from the same rock but cut by myself, with the emery blocks, in the way I have endeavored to describe to you, and, if the mounting material was of as good quality, would be equal to the former in every respect.

In conclusion, it will give me great pleasure to show any of the members of this society how to cut and mount the rock sections at any other time. At some future meeting I hope to be able to give the society the result of my examination of the alays of the Comstock lode, the most interesting and important work I have ever yet undertaken.

A vote of thanks was tendered to Mr. Attwood for his very interesting paper, and the society adjourned.

News in Brief.

IN Upper Silesia 150,000 persons are suffering from famine.

THERE has been a heavy snow storm throughout Hungery.

THE ship *Eugenie Leonie* is a total wreck at Dunkirk, France.

PRINCE ALEXANDER has dissolved the Roumanian Assembly.

JAMES M. EDMONDS, Postmaster at Washington, D. C., is dying.

FURTHER distress is reported from Hungary, owing to inundations.

THE total rainfall in Shasta county up to Dec. 9th has been 19 inches.

FRESH inundations are apprehended in Spain from the Guadiana river.

CONGRESSMAN LAY, of Missouri, died in Washington, December 9th.

TIME of amnesty to Cuban insurgents has been extended to Dec. 15th.

MULES and sleighs are to be used on the Santa Fe stage line, N. M. Territory.

ANOTHER agitator has been arrested at Dublin for using seditious language.

A MANUFACTORY of soaps, soap powders, etc., has been established at Logan, Utah.

THE force of the Tiptop mine, Arizona, is to be increased to 200 men in January.

SINCE the 1st of January, 28,758 German immigrants have landed at New York.

THE number of British war vessels is to be increased on the west coast of Africa.

A MICA mine was sold recently in the Rochfort district, Dakota, for $5,000 cash.

PINOS ALTOS, of New Mexico, continues to turn out about $1,200 in gold each week.

THE chapel in Loudon founded by John Wesley was nearly destroyed by fire Sunday.

THE Egyptian government is actively completing preparations for a war with Abyssinia.

A NEW line of steamers is to be established between Havre, France, and New Orleans.

SEVERAL persons were injured and two killed by a railroad accident in England, Dec. 9th.

C. T GETTING & Co., merchants of London, Buenos Ayrss and Montevideo, have suspended.

THE President has nominated Owen N. Denny, of Oregon, to be Consul-General at Shanghai.

SILVER in London is 52¾d; consols, 97 10-16; 5% United States bonds, 105⅞; 4s, 106⅞; 4½, 109¼.

THE Deer Lodge school district, Montana, has 800 children, of whom 585 draw school money.

A LONDON dispatch announces the death of William John Scott Bentinck, fifth Earl of Portland.

KING JOHN of Abyssinia is moving forward with the main body of the Abyssinian army and forty guns.

AT Liverpool wheat is quoted at 10s 7d to 11s 6d for average California white, and 11s 6d to 11s 10d for club.

THOS. H. MERRY, formerly Lecturer of the State Grange, is mentioned as one of the candidates for Speaker of the Assembly.

A BOILER explosion on board the British war ship *Pelican* killed three persons and wounded a number of others.

THE new Dakota salt springs are 45 miles from Deadwood. The supply is immense, says the Deadwood *Press*.

CHIEF OURAY agrees to deliver up the Indians engaged in the Meeker massacre, provided they are tried in Washington.

IN San Francisco half dollars are quoted at par; trade dollars, 95 buying, 96½ selling; Mexican dollars, 96 buying, 96½ selling.

THE Coroner's jury at Virginia, Nev., find that the disaster at the Union shaft was caused by the engineer's absent-mindedness.

THE storm and freshet of the 19th of November and subsequently was the severest ever known at Panama, doing immense damage.

A BATTLE occurred recently between the Montenegrine and Albanians, in which the latter were repulsed, great loss being inflicted on both sides.

THE mass-meeting to excite public interest in the World's fair of 1883 has been postponed for a month, in the hope that Gen. Grant may then be able to attend.

IN New York Government bonds are quoted at 103¼ for 4s of 1907; 102¾ for 5s of 1881; 105½ for 4½s; sterling, $4.83@4.85½; silver bars, 114¼; silver coin, ½@1 discount.

THE MULTIPLEX COPYING TABLET.—This is one of the latest improvements for lessening clerical labor. By writing on any kind of paper with a peculiar copying ink and laying the written page on the prepared tablet a reversed impression is given from which fifty or a hundred copies of the original may be made. Circulars, letters, etc., may thus be duplicated rapidly and with better labor. There are several forms of this character of tablet in the market, the difficulty with most of them being that the ink is hard to remove from the tablet. In the Multiplex, however, this difficulty has been overcome, the ink being readily wiped off. The composition is put up in a neat wooden box properly lined and ready for use at any time.

Non-Corrosive Lubricating Oils.

At a meeting of the Industrial Association of Moravia, held at Brunn, Mr. G. Ruckensteiner commented on the destructive influence of pure animal and vegetable fat upon steam boilers and engines. These bodies are decomposed by the action of high pressure steam, and fatty acids (Margaric, Stearic, Oleic, etc.,) are set at liberty and attack the iron as he has demonstrated in a series of experiments. He therefore recommends as the only means of preserving machinery and lubricating it thoroughly and economically the use of a hydro-carbon oil, which stands a very high temperature without generating acid, or leaving a gummy deposit about the piston. If it becomes mixed with boiler incrustation it diminishes its tendency to cling to the sides of the boiler, and thus exerts in this respect also a beneficial action.

The Albany Cylinder Oil, for this purpose, is now in use throughout the world, and we refer to nearly all first-class establishments on this coast for evidence of its efficacy. The Albany Lubricating Compound and Cups, the Albany Spindle Oil, etc, can only be gotten from us or our agents. Send for catalogue. Tatum & Bowen, 329 Market street and 3 Fremont street, S. F.

OUR AGENTS.

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S. V. Blakeslee—California.
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Fresh attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

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Sample Copies.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

Extra Copies can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

Chew Jackson's Best Sweet Navy Tobacco

LEATHER.

[WHOLESALE.]

Wednesday, m., December 10, 1879.

Sole Leather, heavy, lb	22 @ 29
Light	20 @ 24
Jodot, 8 Kil., doz	48 00 @50 34
11 to 13 Kil	48 00 @57 00
14 to 19 Kil	61 00 @78 00
Second Choice, 11 to 18 Kil	55 00 @70 00
Cornellian, 12 to 18 Kil	57 00 @67 00
Females, 12 to 13 Kil	63 00 @67 00
14 to 16 Kil	71 00 @76 00
Simon Ullmo, Females, 12 to 13 Kil	58 00 @62 50
14 to 15 Kil	66 00 @70 00
18 to 17 Kil	72 00 @74 00
Simon, 18 Kil	61 00 @63 00
20 Kil	65 00 @67 00
24 Kil	72 00 @74 00
Robert Calf, 7 and 9 Kil	35 00 @40 00
Kips, French, lb	1 00 @ 1 35
Cal. doz	40 00 @60 00
French Sheep, all colors	8 00 @15 00
Eastern Calf for Backs, lb	1 00 @ 1 25
Sheep Roans for Topping, all colors, doz	8 00 @13 00
For Linings	5 50 @10 50
al. Russet Sheep Linings	1 75 @ 4 50
oot Legs, French Calf, pair	4 00 @— —
BGood French Calf	4 00 @ 4 75
Best Jodot Calf	5 00 @ 5 25
Leather, Harness, lb	35 @ 37½
Fair Bridle, doz	48 10 @72 00
Skirting, lb	33 @ 37
Welt, doz	30 00 @50 00
Buff, ft	15 @ 17
Wax Side	15 @ 17

METALS.

(WHOLESALE.

Wednesday m., December 10, 1879.

Iron.—	
American Pig, soft, ton	28 00 @35 00
Scotch Pig, ton	26 00 @30 00
American White Pig, ton	25 00 @— —
Oregon Pig, ton	28 00 @35 00
Refined Bar	4 @ 8
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 8
Norway, according to thickness	7 @ 8
Copper.—	
Sheathing, lb	22 @— —
Sheathing, Yellow	18 @— —
Sheathing, Old Yellow	8 @— —
Nails	25 @— —
Bolts	24 @— —
Brazier's, in all sizes	24 @ 30
Old	16 @— —
Steel.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	18 @— —
Drill	16 @ 17
Flat Bar	18 @ 19
Plow Steel	8 @ —
Tin Plates.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7
Banca Tin	18 @— 20
Australian	15½@ 17
Zinc.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft, 7 to 10, lb, less than cask..	9½@— 10
Nails.—	
Assorted sizes	3 50@4 50

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by Sutro & Co.]

San Francisco, December 10, 3 p. m.

Silver, ¼ par.
Gold Bars, 890@910. Silver Bars, 10@18 ℔ cent. discount.
Exchange on New York, 20, on London bankers, 49½@49¾. Commercial, 50; Paris, five francs ℔ dollar; Mexican dollars, 93@95.
London Consols, 97 9-16; Bonds (4%), 106⅛.
Quicksilver in S. F., by the flask, ℔ lb, 39@40c.

GENERAL MERCHANDISE.

[WHOLESALE.]

Wednesday m., December 10, 1879.

CANDLES.	
Crystal Wax	17 @17½
Eagle	12 @—
Patent Sperm	30@—
CANNED GOODS.	
Assorted Pie Fruits,	
2½ lb cans	2 25 @ —
Table do	3 50 @ —
Jams and Jellies	3 75 @ —
Pickles, hf gal	3 25 @ —
Sardines, qr box	1 67½@1 90
Hf Boxes	2 50 @2 75
Merry, Faull & Co's.	
Preserved Beef,	
2 lb. doz	3 75 @4 00
do Beef, 4 lb. doz	6 50 @ —
Preserved Mutton,	
2 lb. doz	3 50 @3 62½
Beef Tongue	6 25 @ —
Preserved Ham,	
2 lb. doz	6 00 @ —
Deviled Ham, 1 lb,	
dox	4 50 @ —
do Ham, ½lb doz	3 00 @ —
Boneless Pigs Feet,	
3 lbs	3 75 @ —
2 lbs	2 75 @ —
Spiced Fillets,	
2 lbs	3 75 @ —
Head Cheese,	
3 lbs	3 75 @ —
COAL—Jobbing.	
Australian, ton	6 50 @ 7 50
Coos Bay	— @ 5 50
Bellingham Bay	— @— —
Seattle	5 50 @ 8 00
Cumberland	13 00 @15 00
Mt Diablo	4 75 @ 5 75
Lehigh	11 50 @12 00
Liverpool	8 00 @ 6 50
West Hartley	— @ 8 00
Scotch	— @ 8 00
Scranton	— @— —
Vancouver Id	7 50 @— —
Wellington	— @ 7 00
Charcoal, sack	75 @— —
Coke, hush	60 @— —
COFFEE.	
Sandwich Id, lb.	— @— —
Costa Rica	18 @ 16½
Guatemala	16 @ 16½
Java	25 @— 26
Manila	17 @— —
Ground, in cs	25 @— —
FISH.	
Sac'to Dry Cod	— 2½@ —
do in cases	— 3½@ —
Eastern Cod	— — @— —
Salmon, bbls	7 00 @ 7 50
Hf bbls	3 50 @ 4 00
1 lb cans	1 40 @ 1 50
Pkld Cod, bbls	— — @— —
Hf bbls	— — @— —
Mackerel, No. 1.	
Hf Bbls	8 50 @10 00
In Kits	3 00 @ 3 25
Ex Mess	3 50 @ 3 75
Pkld Herring, bx	3 00 @ 3 50
Boston Smkd H'g	50 @— —
LIME, Etc.	
Plaster, Golden Gate Mills	3 00 @ 3 25
Land Plaster, tn	10 00 @12 50
Lime, Sta Cruz, bbl	1 25 @ 1 50
Cement, Rosendale	2 00 @ 2 25
Portland	4 00 @ 4 50
NAILS.	
Ass'ted sizes, keg	4 25 @ 4 75

OILS.	
Pacific Glue Co's Neatsfoot, No 1	1 00 @ 90
Castor, No 1	1 30 @ —
do, No. 2	1 20 @ —
Baker's A A	— @1 30
Olive, Piagniol	5 25 @5 75
Possel	4 75 @5 25
Palm, lb	9 @ —
Linseed, Raw, bbl.	85 @ —
Boiled	90 @ —
Cocoanut	60 @ —
China nut, cs	72½@ 73½
Sperm	1 40 @ —
Coast Whales	35 @ 45
Polar	— @ 45
Lard	80 @ 90
Oleophine	— @ —
Devoe's Bril't	16 @ 17½
Photolite	— @ —
Nonpariel	— @ —
Eureka	19 @ 20
Barrel kerosene	20 @ —
Downer Ker	30 @ —
Elaine	34½@ —
PAINTS.	
Pure White Lead.	8 @ 8½
Whiting	1¼@ —
Putty	4 @ 5
Chalk	1¼@ —
Paris White	2½@ —
Ochre	3½@ —
Venetian Red	3½@ —
Averill Mixed Paint, gal.	
White & tints	2 00 @2 40
Green, Blue & Ch Yellow	3 00 @3 50
Light Red	3 00 @3 50
Metallic Roof	1 30 @1 50
RICE.	
China, Mixed, lb	4½@ —
Hawaiian	6½@ —
SALT.	
Cal. Bay, ton	17 00 @24 00
Common	10 00 @12 00
Carmen Id	12 00 @25 00
Liverpool fine	18 00 @— —
SOAP.	
Castile, lb	8 @ 15
Common brands	4½@ 6
Fancy brands	7 @ 8
SPICES.	
Cloves, lb	47½@ 50
Cassia	19 @ --
Nutmegs	97½@1 10
Pepper Grain	14 @ 15
Pimento	19 @ 20
Mustard, Cal., ¼ lb glass	— @1 25
SUGAR, ETC.	
Cal. Cube, lb	— @ 12½
Powdered	— @ 12½
Fine crushed	— @ 12½
Granulated	— @ 12½
Golden C	— @ 11
Cal. Syrup, kgs	70 @ —
Hawaiian Mol'ses	25 @ 30
TEA.	
Young Hyson, Moyune, etc	40 @ 65
Country pckd Gunpowder & Imperial	35 @ 75
Hyson	30 @ 35
Fooo-Chow O	27½@ 32½
Japan, 1st quality	40 @ 60
2d quality	25 @ 40

LUMBER.

Wednesday m., December 10, 1879.

CARGO PRICES OF REDWOOD.

Rough, M	14 00
Surface	24 00
Rustic	24 00
do, No. 2	18 00
Flooring	24 00
do, No. 2	17 00
Beaded Flooring	28 00
Refuse	20 00
Half-inch Siding	20 00
Refuse	16 00
Half-inch Surfaced	24 00
Refuse	18 00
Half-inch Battens	16 00
Pickets, Rough	11 00
Rough, Pointed	12 50
Fancy, Pointed	18 00
Shingles	1 75

REDWOOD. RETAIL PRICE.

Rough, M	18 00
Pickets, Rough	15 00
Pointed	16 00
Fancy	22 50
Siding	20 50
Surfaced & Long Beaded	30 00
Flooring	25 00
do, No. 2	17 00
Rustic, No. 1	25 00
do, No. 2	18 00
Battens, lineal ft	
Shingles M	2 00

PUGET SOUND PINE. RETAIL PRICE.

Rough, M	18 00
Fencing	18 00
Laths	3 50

Signal Service Meteorological Report.

San Francisco.—Week ending December 9, 1879.

Dec. 3	Dec. 4	Dec. 5	Dec 6	Dec. 7	Dec. 8	Dec. 9
HIGHEST AND LOWEST BAROMETER.						
30.129	30.225	30.188	30.152	30.037	30.139	30.220
30.073	30.100	30.133	30.083	29.012	20.814	30.150
MAXIMUM AND MINIMUM THERMOMETER.						
58	50	61	58	50	60	55
51	51	53.5	51	48	43	45
MEAN DAILY HUMIDITY.						
78.3	81.7	89.3	73.7	77.7	60.7	78.7
PREVAILING WIND.						
W	SE	SE	W	S	NW	SE
WIND—MILES TRAVELED.						
142	129	181	156	194	324	173
STATE OF WEATHER.						
Fair.	Cloudy	Cloudy	Clear.	Fair.	Fair.	Fair.
RAINFALL IN TWENTY-FOUR HOURS.						
.37		.68		.23	.14	.00

Total rain during the season, from July 1, 1879, 0.66 in.

Annual Meeting.

The annual meeting of the stockholders of the Gould & Curry Silver Mining Company will be held at the Company's office, Room No. 60, Nevada Block, No. 309 Montgomery street, San Francisco, California, on Monday, the fifteenth day of December, 1879, at one o'clock, p. m. Transfer books will close on Friday, December 5th, 1879, at three o'clock, p. m.

ALFRED K. DURBROW, Secretary.

The Large Circulation of the Mining and Scientific Press extends throughout the mining districts of California, Nevada, Utah, Colorado, Arizona, Idaho, Montana-British Columbia, and to other parts of North and South America. Established in 1860, it has long been the leading Mining Journal of the continent, its varied and reliable contents giving it a character popular with both its reading and advertising patrons.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Aurora Mining Company—Location of

Principal place of business, San Francisco, California. Location of works, Iowa Hill, Placer County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the third day of December, 1879, an assessment, No. 1, of ten cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the Company, No. 28 Sansome street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Third day of January, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the 19th day of January, 1880, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors. P. CONKLIN, Secretary.

Office, 28 Sansome Street (up-stairs) San Francisco, Cal.

Butte Hydraulic Mining Company.—

Location of principal place of business, San Francisco, California. Location of works, Butte County, Cal.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 2) two levied on the Thirty-first day of October, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
E Poirson	13	2½	$25 00
L Lapierre	22	2½	25 00
H Marcoux	24	2½	25 00
J H Lussier	25	2½	25 00
John Britt	26	2½	25 00
Geo W Deitzler	37	5	50 00
N Desautelle	41	2½	25 00
Jos Lucier	42	2½	25 00
N Goldtree	43	7½	75 00
Geo Moreau	44	5	50 00
Z Gervais	45	10	100 00
Geo Moreau	40	5	50 00
Geo W Deitzler	47	15	150 00
A S Hawes	17	10	100 00
J Gallandreau	4	10	100 00
A M Wildor, Trustee	1	10	100 00
A L Lengfeld	5	5	50 00
L L Dennery	6	5	50 00
W E Lutz	7	5	50 00
G W Rivers	11	5	50 00

And in accordance with law and an order of the Board of Directors made on the 31st day of October, 1879, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the company, room 3, No. 220 Sansome street, San Francisco, California, on Monday, the 22nd day of December, 1879, at the hour of 10 o'clock a. m. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

L. L. DENNERY, Secretary.

Office, room 3, No. 220 Sansome St., San Francisco, Cal.

Cataract and Wide West Hydraulic Gravel

Mining Company. Principal place of business, San Francisco, California. Location of works, Ebo Mining District, Calaveras County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 15th day of November, 1879, an assessment of Twenty-five cents (25 cts.) per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary at 26½ Kearny street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on Monday, the 22d day of December, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 12th day of January, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

WM. B. LAKE, Secretary.

Office, 26½ Kearny Street, San Francisco Cal.

Land Purchasers' Association.—Office,

No. 318 Montgomery street, San Francisco, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment, (installment No. 43), levied on the 5th day of November, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares	Am't.
James E Boyce	No cert. issued	1	$6 00
V Chevallier	No cert. issued	1	6 00
John A Collison	20	1	6 00
David S Hutchinson	251	1	6 00
Mrs M A Hutchinson	252	1	6 00
Chas Lemon	170	2	12 00
Mrs N McCarty	No cert. issued	1	6 00
Mrs W W Newell & D Hicks (guardians)	242	1	6 00
Mrs W W Newell & D Hicks (guardians)	248	1	6 00
Mrs W W Newell & D Hicks (guardians)	247	8	48 00
F A Rouleau	250	3	18 00

And in accordance with law, and an order of the Board of Directors, made on the 5th day of November, 1879, so many shares of each parcel of said stock as may be necessary, will be sold at public auction at the office of the Secretary, 318 Montgomery street, San Francisco, California, on Saturday, the third day January, 1880, at the hour of one o'clock, p. m., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

G. S. WRIGHT, Secretary.

Office, 318 Montgomery street, San Francisco, Cal.

Numa Mining Company.—Principal Place

of business, San Francisco, California. Location of works, Humboldt County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 23rd day of October, 1879, an assessment (No. 2) of Two Cents (2) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 328 Montgomery St., room 21, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 24th day of November, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 15th day of December, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

DAVID WILDER, Secretary.

Office, 328 Montgomery St., Room 21, San Francisco, Cal.

POSTPONEMENT.—The day of delinquency of the above assessment is postponed to December 22nd, 1879, and the day of sale to January 12th, 1880. By order of the Board of Trustees. DAVID WILDER, Secretary.

Room 21, 328 Montgomery street. San Francisco.

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Chapter III.—IRRIGATION.—The Object one of Great Importance.—Need of Better Legislation.—Water, the Property of the People.—Examples of Successful Irrigation.—Value of our Mining Experience.—Sources from which Water is Obtained.—Methods of Lifting Water.—Artesian Wells.—How to Use Water, when Obtained.—Winter Irrigation.—Examples of its Use.—Irrigation in Lombardy, and elsewhere.—A Govermental System Needed Here Also.

Chapter IV.—WIND-BREAKS AND HEDGES.—Benefits to be Derived from a Use of Wind-breaks.—Kinds most Popular.—Other Valuable Varieties.—The Best Way to Procure Trees in Large Quantities.—Hedge Plants for Fences.—The Plants Adapted to our Climate.—The Value of Low Boundaries for Ornamental Purposes.—Shrubs which may be Used.

Chapter V.—FRUIT TREES AND SMALL FRUITS.—California's Leading Industry.—Orchards: Where to Plant Them.—Treatment, Pruning, etc.—A List of Fifty Trees, for a Family Orchard.—Leading Market, Drying and Canning Varieties.—Their Culture, and Best Kinds Known.

Chapter VI.—SHADE TREES.—Universal Love of Shade Trees.—Their Measureless Beauty.—My Friend who uses too many Evergreens.—The Proper uses of Conifers, and the most Desirable Kinds.—How to Transplant Evergreens.—Deciduous Trees.—Their Great Variety, and Place in Landscape Gardening.—Leading Varieties.—Nut-bearing Shade Trees.—Trees with Tropical Foliage.—The Weeping Trees.—Ancestral Oaks.

Chapter VII.—SHRUBS.—The Value of Shrubs.—Their Easy Culture, and Clustered Memories.—Shrubs for Each Season.—Deciduous and Broad-leaved Shrubs.—Diseases, Treatment and Method of Training.

Chapter VIII.—THE VEGETABLE GARDEN.—Farmers ought to Raise More Vegetables.—Different Ways of Laying out a Garden.—The Combination System.—General Culture and Treatment. The Tools Needed.—Notes on the Best Vegetables.—Birds in the Garden.

Chapter IX.—FLOWER GARDEN AND LAWN.—Lord Bacon's Remark.—The Universality of Gardens.—Their Infinite Variety.—The Time when our Gardening Calendar properly Begins.—Autumn Work.—Our Californian Winter, and the Happy Awakening of the Flowers.—Gardens must be Permanent, kept Clean, and full of Fragrance and Gifts.—How to Lay Out a Garden.—Plans, Walks, advisable Flowers and Edgings.—Roses.—Garden Statuary.—Concerning Rock-work.—Aquatic Gardens.—Lawns.—Beds Cut in the Lawn.—The Enemies of the Garden and Lawn.

Chapter X.—SEEDS, AND SEED PLANTING.—The Way Plants Grow.—Some of the Curious Things about Seeds.—Sowing of Flower Seeds.—Preparation of Soil.—Planting and Covering.—Tree and Shrub Seeds.—The Critical Periods.—Subsequent Treatment.—The Three Enemies.—The Delight of Success.

Chapter XI.—CUTTINGS.—Nature Provides for many Ways of Increase.—Plants may be grown from Cuttings, Slips or Pipings.—Nurseryman, Florist, and Gardener, Depend on this System.—The Ease with which Some People Start Cuttings.—The Difficulties of Others.—The Practical Divisions of Soft-wood, Hard-wood, Leaf and Root Cuttings.—Each one, Considered Separately.—Closing Hints.—Layers, and the Probable First Suggestions of Layering.

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The above is the title of an illustrated work of 114 pages, for miners and prospectors, by Chas. H. Aaron, which has been issued by Dewey & Co. Mr. Aaron has managed to give many useful hints and suggestions, free from all technicalities, and in such a style as to be easily comprehended. It is written for the miner, with no chemical symbols or metallurgical technicalities to confuse those who are not chemists or metallurgists. The following summary of the contents of the work will give an idea of its scope:

Under the heading of the first chapter, "Testing Ores for Silver," we find paragraphs on ore formation test for silver, with heat and water, acid or blow pipe. In speaking of testing for a process, the extent and richness of ore is considered, smelting ores, selecting and working sample, appliances for testing, roasting, etc. Under the head of "Working Ores" the author describes Aaron's process, has something to say of superheated steam, preparation of dichloride of copper and protochloride of copper, use of copper and iron, quantity of chemicals, carbonate of lime, chloride ores, amalgam, Patchen's process, etc. He also describes the methods of working roasted ores, treatment of base metals, stirring, heat of furnace, want of sulphur, etc. Under the head of "Leaching Processes" are the titles, Smelting, Mexican process, Chilean process, Kroehnke's process, etc. Under "Pulverizing Machines" are described the arastra and its construction and operation, stamp batteries, screens, Crocker's trip-hammer battery, Paul's pulverizing barrel, Kendall's battery, Noice's pulverizer, a cheap rock breaker, etc.

In speaking of amalgamators the author describes a cheap amalgamator, grinding the ore, directions for making a barrel, preventing mechanical wear, use of quicksilver, copper in bars, Freiberg barrel, cheap barrel trough, barrel on rollers, Aaron's amalgamator, separator, etc.

He describes an improvised retort, roasting furnace, furnace tools and furnace building. Among the miscellaneous mention may be found Aaron's leaching apparatus, with two or three different arrangements, a small mill, sampling tailings and settling tanks, dichloride of copper, etc. Mr. Aaron is a practical miner, of long working experience on this coast.

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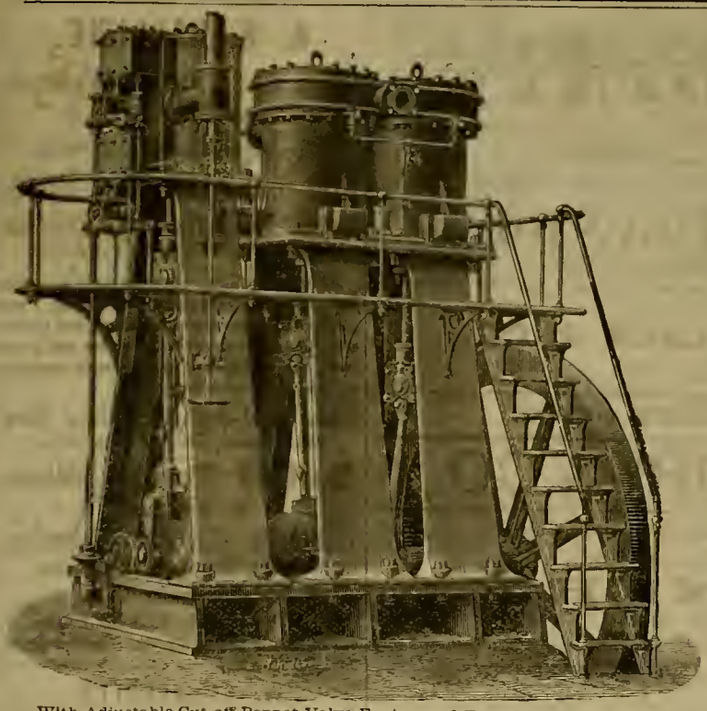

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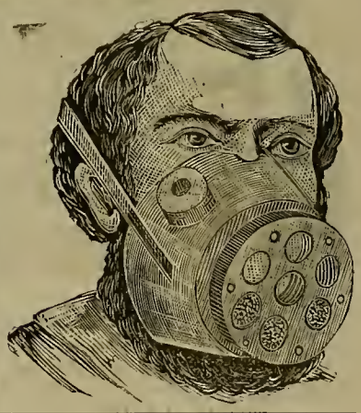

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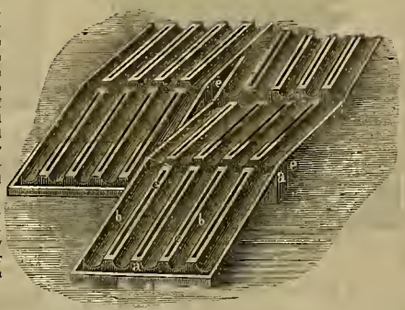

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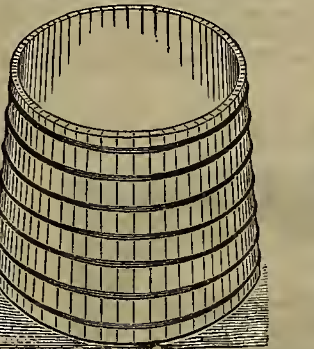

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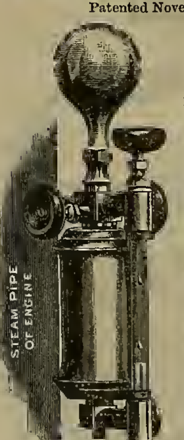

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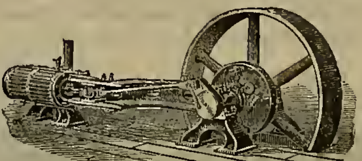

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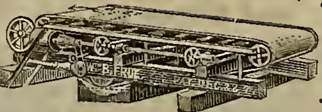

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VOLUME XXXIX Number 25.

Blake's Sectional Cushioned Crushers.

The accompanying engravings illustrate a very important improvement recently made in the well-known Blake ore crusher. In the new machine, the "Challenge Rock Breaker," the heavy cast-iron frame of the old form of crusher is dispensed with, and the main tensile strains, due to the crushing between the powerful jaws, are brought upon wrought iron or steel instead of cast iron. This improved construction makes the machine much less bulky and lighter, as well as very much stronger.

The construction of this machine is shown in the engravings and its operation will be readily understood. A three-sided frame-work of cast iron, with broad flanged base, holding the movable jaw in suspension, forms the front part of the machine, between the upright convergent jaws of which the stone is crushed.

The jaw shaft is held in place by wrought iron or steel clamps, *C*, which serve to take part of the strain due to crushing in the upper part of the jaw space, and also serve as walls thereof. In the lower part of the three-sided frame or front part of the crusher, and on each side of it, are holes in the casting to receive the main tension rods which connect the front and rear parts of the machine. The rear part, *B*, is called the main toggle block, and is also provided with holes for the tension rods, *R*, *R*, corresponding to those in the front casting.

These two parts of the machine are connected by the main steel tension rods, *R*, *R*, each provided with screw thread and nuts, by which their lengths and the jaw opening are readily adjusted to crush coarse or fine, as may be desired.

The front and rear castings are supported on parallel timbers, to the underside of which are bolted the boxes carrying the main eccentric shaft, provided with fly wheels and pulley. The timbers are thus made component parts of the machine, and take the transverse strain which comes upon the pitman connecting the main shaft, and the toggle joint placed in the rear of the movable jaw, and between it and the main toggle block.

Between the broad flanged bases of the front and rear castings and the timbers on which they rest, are placed flat rubber cushions one-quarter to three-eighths of an inch thick. Every revolution of the shaft brings the toggles more nearly into line, and throws the swing jaw forward; it is withdrawn by the rod provided with rubber spring, *L*. In this way a short reciprocating or vibratory movement is communicated to the movable jaw.

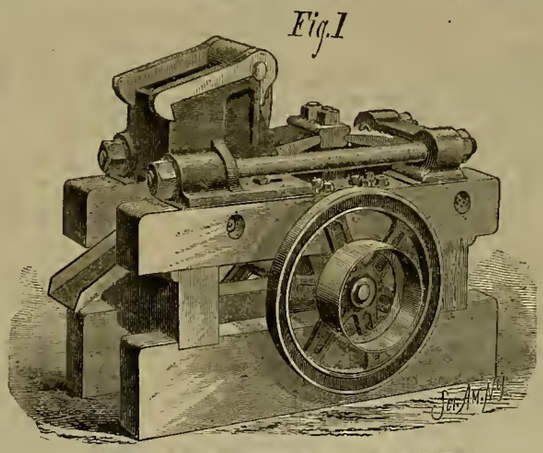
This new construction of the Blake stone crusher—while the principle of crushing between upright convergent jaws is the same as in their old machine, evidently possesses many and great advantages over the old forms. It is sectional. The weight of the heaviest piece in crusher size 15x9 inches is about 2,400 pounds instead of nearly 8,000. The rigidity inseperable from machines with cast-iron frames, and which is the cause of frequent breakages, is completely overcome, and the longitudinal as well as transverse strains are brought upon materials which are strong and elastic as compared with cast iron. The rubber cushions, while offering sufficiently great resistance to compression in case of the breakage of stone or in doing the normal work of the machine, will, in case of the accidental intrusion of steel hammers or anything of that kind, be compressed and so permit the partial revolution of the fly-wheels before coming to a full stop, thus relieving the machine of those nearly infinite strains to which those of the old form were subjected, and which resulted in the breakage of important parts. The toggles are long, and of equal length and may be worn indefinitely as compared with those in the old machine.

The construction of the pitman is such as to admit of change of inclination of the toggles, and consequently of adjustment of the length of stroke of the movable jaw. The jaw opening can be varied between any working limits by means of the nuts on the tension rods, and the machine be set to crush coarse or fine as may be desired. The crusher, it is stated, can be run at a higher rate of speed with safety than either of the old forms of crusher with cast-iron frames, and will consequently do a greater amount of work. The manufacturers inform us that while this machine is very much lighter than the old forms, it has at least double their strength.

The new rock breaker has been repeatedly subjected to the test of a steel hammer being thrown between its jaws, when going at as high a rate of speed as 300 revolutions per minute, without injury to or breakage of the machine.

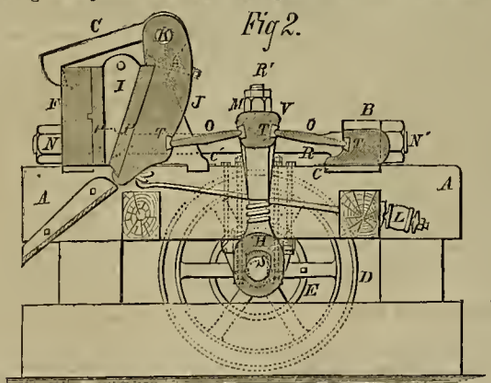
The improved machine is the invention of Mr. Theodore A. Blake, mining engineer and Secretary of the Blake Crusher Company, of New Haven, Conn. This gentleman is well known on this coast, where he resided for some years, in the pursuit of his profession. He was at one time Corresponding Secretary of the California Academy of Sciences. One of the improved machines may be seen at the Union Iron Works, on First street, Messrs. Prescott, Scott & Co. acting as agents for this coast. Several sizes are made, from 10x7 up to 15x9, the dimensions indicating the receiving capacity of the machine in inches.

Fig. 1



THE BLAKE CHALLENGE ROCK CRUSHER.

Fig. 2.



LONGITUDINAL SECTION OF BLAKE CRUSHER.

A Disastrous Blast.—We see by the Nevada *Transcript* that a big blast put off this week at the Polar Star mine, Dutch Flat, did some very serious damage. A number of people had gathered to witness the explosion, and as it only forced out the face of the bank, large boulders were thrown among the crowd of people, mashing one man's foot, breaking another's arm, and seriously wounding a number of others. The blacksmith shop was demolished, and a lot of hydraulic pipe ruined.

Fourteen thousand immigrants arrived at New York during November. Since January 1st they number 125,000, being an increase of 49,755 over the corresponding period of last year.

A Good Mining Season.

The outlook for the hydraulic miners the coming season is exceedingly gratifying. A great deal of water has fallen, soaking the ground pretty deep and the snow will hold well. The season has begun with very good prospects. From all directions we hear of the mines having plenty of water, and as most of them were prepared for the rush of water, they are able to utilize every inch that comes to them. The early rains have furnished water for mining in dry gulches and the ground has been made softer for prospectors. The mining community hope for a very wet season, so they will get an abundance of water for their work. The currents of the mountain streams are all rapid and full and the harvest of the miner is now being reaped.

The quartz mining prospects are also of a hopeful character. More attention is being turned to California properties than has been the case for many years. It is found that they pay better in the end than more brilliant looking schemes afar off. The era of railroads, good wagon roads, cheap supplies, etc., has had an exceedingly beneficial effect on the California mining interests, making profits greater and leading to many new developments. Hundreds of old mines are being re-opened which ten years ago were valueless. If we could only find a cheap method of working our sulphureted ores the quartz mines of this State would be more than doubled in value.

Copper Market.—Our latest advices from the East show a firmness in copper, with moderate sales. Holders refuse to sell for spring delivery except at an advance of 10%. Prices remain unchanged, as will be seen by our market reports.

The Want of Custom Mills.

The great want of most of the mining communities on this coast is custom mills, where working miners can have their ore treated fairly and honestly for a suitable compensation. The establishment of a big private mill for some wealthy mining company in a new camp is by no means all that is necessary to bring that camp out of obscurity into prosperity. If successful, it will bring notoriety to the camp and to the company, and even if not successful, it will enable the owners of the stock to give it a marketable value upon which to speculate, which would seem the only reason, in many instances, why mills were built.

It is not works of this character, however, which build up a camp, nor have the operations of the largest mines so exclusive an influence in this direction as is commonly granted to them. True, a big mine may employ a number of miners and draw the attention of capitalists toward the corner of the country where it is located, but even this is not always to the benefit of the camp itself. If the capitalist owns the mine, just so much or so little money, as is necessary to run it, is spent there, and the rest of the bullion goes to the city to be invested elsewhere, or to swell hoards already large. It would be better for the country to see the money scattered among the many than be accumulated by the few. We do not speak in any socialistic spirit, but would like to see the mining districts themselves prosperous, as well as the city, to which most of the money from the mines finds its way.

Without custom mills the prospector, discoverer and miner must sell his mine before it can be developed. What remains for him then is to repeat the operation—a thing not always easy to do—or to go to work by the day on the mine which was his own. As a general thing, the miner himself gets no very fancy price for his ground—the middle men, "honders," "placers" and incorporators are the lucky ones in such transactions.

How much better would it be for miners to own their own small mines all over the country, as the farmers own their farms, and work them for their own good and profit. The farmers can't afford to own threshing machines and engines, many of them, yet these machines travel about from farm to farm, and put the farmer's crop in marketable shape for him, without stealing very much of it, either. The miner half the time can't even find a place to take his produce to, much less get it put in shape for market.

There are lots of places all over the coast where, if a mill were put up, the opening of scores of mines would be assured. The wonder is, that some big company has not been organized with this object in view, long before this; to find out by proper investigation suitable locations and start small custom mills, on a fair and honest basis—no charging a big price for crushing and then stealing half the amalgam. Then by and by either sell or remove the mill, or keep it running as the prospects indicate.

With custom mills, the miners themselves would reap more of the results of prosperity of the mines. They would not be so dependent on the capitalists. They would not see all the bullion produced going out of their reach a few hours after it was produced; and they would be encouraged to prospect and open new mines. What encouragement is there in working six months to open a mine and take out ore with no chance to make a cent except by sitting down to wait for some one to buy the mine, not the ore? What encouragement is there even to prospect very much, in a region where there is no custom mill, or where there is one under dishonest management? It is to the custom mill that all distant camps are to look for their prosperity, and we would rather hear of one going to a camp than to hear of half a dozen for private companies. The private ones don't help prospectors much. All new districts need them. The southern and eastern part of our own State, Arizona, New Mexico, Idaho, Montana, Nevada, in fact all the mining States and Territories, want ten custom mills where there is now one.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Quartz Mining in Amador.

EDITORS PRESS:—This county is justly celebrated for its gold-bearing quartz. In this respect it has always ranked among the foremost in the State; nor is it likely to lose its prestige soon if the present and its prospects are any index of the future. With rare exceptions, such as the Downs and others at Volcano, the principal and most profitable mines are found on the mother lode, or central belt, extending the entire length of the county from north to south. Much prospecting has been going on lately all along this line, as well as in other parts, resulting in some important developments.

A large area still remains to be explored. In some counties, richer specimens of ore may have been met with, but few, if any, can offer a safer field for investment. The gold, in places, is so evenly distributed through the quartz that the whole is worked with a profit even where of low grade—the run being made with a full quota of stamps and a due regard to economy in other respects. A brief allusion to points visited and mines adjacent is now in order.

Ione City,

The terminus of a branch road connecting with the Central Pacific at Galt, Sacramento county, is more like a village than a city, taking its appropriately charming name from the no less beautiful valley in which it is situated. There is a copper mine in the vicinity, and several coal mines in active operation.

Jackson, the County Town.

Is somewhat more pretentious, having some 1,500 inhabitants, all told. Less favored than Ione, in good farming land, in mineral resources, it possesses many important advantages, located as it is, near some of the most productive mines of both Amador and Calaveras counties. The present outlook, in its more immediate vicinity, is also said to be unusually good, having had some fresh blood infused in the form of San Francisco capital.

The Zeile, an old mine under a new name (and, to be hoped, under better auspices), has had the shaft retimbered and hoisting works erected with a capacity sufficient for a depth of 3,000 feet; while all is life and bustle to get the new 40-stamp mill in readiness by February next, the same to be equipped with 16 Frue concentrators and all other first-class appointments.

The Moore is looked upon as a good mine, but at this time is greatly in need of a similar helping hand as that recently tendered to the Zeile. It has reached a depth of 250 feet. Lode from 3 to 10 feet thick, with a large body of low-grade ore. The entire property consists of 120 acres, on which there are several other promising veins.

The Monterichard, at the depth of 425 feet, shows a three-foot vein of ore which averages about $8 per ton. The 10-stamp mill is kept steadily running. The mine is said to be paying well and to have paid from the start.

The Oneida, midway between Jackson and Sutter Creek,

Belongs, perhaps, as much to one place as the other. It has been worked, with varied success, for 25 years, and for the past 14 years almost uninterruptedly. Linear extent, 6,000 feet; width of vein, 6 feet; greatest depth, 1,350 feet; size of mill, 60 stamps; number of men employed, upward of 100. From tests made from ore taken from the lowest level which is now being opened, the company are led to hope that it will prove remunerative.

The Lincoln still continues to pay well, the 40-stamp mill at present running on rather low grade ore.

The Con. Amador have abandoned the old mine (where one of your capitalists struggled long and manfully with ragged poverty at his door), and are now down 450 feet on the north. At this point there is a large extent of virgin ground, which had been previously prospected by shaft with such favorable promise as almost to make success a certainty.

The Amador Canal & M. Co., with office here, furnishes the motive power for nearly all the mills of the county—main canal, 45 miles; inclusive of distributing ditches, upwards of 100; receiving water from main fork of the Mokelumne river and large reservoirs in the mountains, embracing the Blue lake of Alpine county.

Amador County

Is a very flourishing place, built up chiefly by the Bunker, Original Amador and the Keystone, giving employment to hundreds of men, with mills and works on a grand scale, and disbursing immense sums annually. The Bunker is a 3-foot vein, depth, 450 feet, the rock working from $8 to $11 per ton. It is somewhat a matter of regret that facts and figures for publication could not be obtained in regard to the last two, particularly as to the Keystone, its reputation at home placing it among the best paying mines of the State. The South Spring, adjoining, and the Talisman, still further south on the same range, are said to continue their promise as developments progress.

Following the main belt in a northerly direction from two to three miles, there are found a large number of locations in

The Vicinity of New Chicago.

They have all been opened to a greater or less extent, and generally look very encouraging. The greatest depth (1,000 feet) is in the Gover, which has had a large body of water to contend with. This is now under control. In the 700 level north, as also in the 900 level, a body of fine ore, six feet thick, is reported. Among the other claims here may be mentioned the Maryland, Seaton, the California, the Hazard, the Nevada, and the California North—the last named at 200 feet depth, showing a 3-foot vein, with ore from $8 to $15 per ton. The Nevada and some others prospect so well that the owners think they have a second Keystone.

Plymouth and its Mines.

The principal mine, and laying claim here to be among the best in the State, is the Empire, paying from $30,000 to $50,000 per month. The citizens may be pardoned for glorying a little in its richness, as under its potent spell the place has evidently had a very rapid growth, and is still spreading as a "young bay tree" of Palestine, the large number of new buildings giving it a very fresh and lively aspect, contrasted with the old and dilapidated look of many mining towns.

Some Facts as to Mine and Mill.

Greatest depth of mine, 1,200 feet; width of ore, 50 feet; length of present pay chute, 600 feet; number of stamps in mill, 80. Mine said to have ore enough in sight above the 1200 level to keep mill running 10 years. Steel cams and tappets, after thorough trial, preferred to those of cast iron. A 20-inch wheel of the Company's devising, cast at the foundry of Donnelly & Co., Sutter Creek, gives better satisfaction than any other of the kind used. Their belts from a New York house are thought to be unrivaled in their line. They are composed of two broad bands of leather, with a like width of thick canvas cloth between; the whole firmly riveted together.

An Ingenious Contrivance.

In connection with the mine are six engines, all exhausting their steam into one common boiler, from which hot water is taken for all the others. To this boiler is attached a syphon through which a supply of cold water rises a sufficient hight to give a fall of 40 feet, condensing all the steam from the engines, and at the same time causing a vacuum which is thought to give a pull equal to 25 pounds of steam, thereby making a saving as they claim of at least three cords of wood in 24 hours.

Of the other claims here, the Reese, owned by Messrs. Hayward & Woolford, has a 60-foot shaft and a five-foot vein, the ore being put at about $10 per ton. The Pacific, immediately south of the Empire, is eight feet in width, and the Fort Johns, still further south, is represented as having a very large body of ore, mostly low grade.

All the places from Jackson on the south to Plymouth on the north are situated in the order named, and follow what is known as the main belt. It remains now to be seen from a few cases of

Quartz Operations Around Volcano

That all the good mines are by no means confined to this belt. The Downs, for a small mine—vein from three to five feet—is looked upon as one of the most profitable in the State. Its average yield is $40 to the ton of ore. The rock of the Stewart and Gilleck is put as high as $30 per ton. The Grieshach is well spoken of, value of ore not learned. Robinson & Jones claim $10 (working process) from a four-foot vein, and also from a smaller vein two to three feet wide, from 300 to 400 tons in sight that will run as high as $25. Mr. W. P. Sargent, Superintendent of the Golden Gate Consolidated—property of a Boston company—has sunk 100 feet since taking charge, making now a total of 300 feet and has run levels of 40 feet north and south on a three-foot vein of fine ore. He places it from $30 to $40 per ton. Making all due allowance for over estimates in some instances, few towns can make any better showing. Then there is the Tellurium at Pine Grove in this same vicinity, that claims $565 from a crushing some time since, of 18 tons of ore; and now the company report a strike of some very rich rock which they rate somewhere from $50 to $75 per ton. Their mill will soon be run by water, vice steam as heretofore, at a very considerable reduction in the way of expense.

Hoping that they and all others here may be happy in the realization of their brightest anticipations, I remain as ever yours,

A. C. K.

Marin County Gold Mines.

EDITORS PRESS:—The above heading may be considered by some to be only figurative language alluding to the rich, golden butter—their pride and livelihood; no, sir, not figurative, but a plain fact, that Marin county, too, has gold-bearing quartz.

It is said that when the North Pacific railroad was graded, some gold was discovered near Nicasio station, in White valley, about eight miles from San Rafael; but this resulted in no permanent locations. In 1877, Mr. Peck, of San Francisco, and three others, visited the valley, bringing with them what they called a "magnetic divining rod," and proceeded to search for mines. They soon found favorable noddings of "the little joker," as it is more commonly called, and proceeded to make title to their find by locating four claims of 750 feet each. Being a Spanish grant land they were obliged to respect the rights of Mr. R. K. Rogers, the owner of the ranch. From him they obtained very favorable terms and ample privileges.

Their recorded contract with Mr. Rogers, allows them four years working privilegs, and of all the gross proceeds of the mines they give Mr. Rogers one-twentieth as rental or recognition of his right in the realty. The miners have the right to purchase the mine at any time for $30,000.

About one year since they had such favorable prospects as seemed to warrant the expense of steam hoisting works, which they now have erected under the superintendency of Mr. A. C. Burrington, who has shown ability and economy in all his plannings and outlays. Have shaft down 200 feet and tunnel drift from bottom of shaft 215 feet, all the way in ledge matter with frequent streaks of good quartz, and some assaying as high as $90 per ton. They propose drifting on till reaching the north hanging wall of the ledge. Have had hard blasting rock all the way, but the strong Giant powder and drills do successful work. A small blower with tin tubing gives them plenty of fresh air. The prospect at this early stage of development looks certainly quite encouraging. Some choice specimens show rich in gold to the naked eye. The ledge boldly outcrops, and a lad broke a nice specimen of quartz gold from the outcropping rock.

The location for mine and mill is admirable; wood very abundant, and redwood timber on the hills near by, in the midst of excellent ranches, Nicasio railroad depot close by, and also near to the powder mills.

I was told at the mine that Governor-elect Perkins came, saw, and purchased an interest in the mine, not from any faith in the "little joker," but from the showing made by powder and pick.

Whoever views the San Geronimo mine will congratulate the locators, and commend their good judgment in a wise selection of a place to use their little joker. And even those who may believe the joker (under any of the names it has borne for the past 100 years) to be a fraud, will not withhold their best wishes for full success in this enterprise.

The mine employs 13 men in all, paying tub tenders $2.50, miners $3, and engineer $3.50.

Some prospecting is going on in different parts of the county for gold. Mr. Murray, near Nicasio, is in danger of finding *coal oil*. He has found some of the Santa Cruz gas in his tunnel, which, on being ignited, singed his whiskers. It is for further development to say what his find is worth. If further off it might be a big thing, but it is too near market to be valuable for speculative purposes.

December 1st, 1879. B. W. C.

Oil Wells and Refineries of Southern California.

The *Mercury* of San Buenaventura in a late issue thus mentions, through a correspondent, the growing oil industry of our southern counties: There are some five oil wells at San Fernando; depth from 200 to 600 feet. The refinery, at which these oils are prepared for use, is at Pico, near Newhall. It is at these works at Pico that the oil from Moody's gulch is refined. These five wells and refinery are in Los Angeles county near the southern border of Ventura. There are in Ventura county, on what is known as the Exmission lands, eight wells from 100 to 200 feet in depth, all of which yield oil by pumping; some more and some less. But two of them at present are in operation, owing to the low price of oil in market. The two that are in operation yield 30 barrels a day. There are also six tunnels that yield on an average three barrels a day.

There is a well at Sespe 1,500 feet deep that yields 100 barrels a day. This well is owned by a Los Angeles company, but most of the oil is brought to San Buenaventura for refining. They have in contemplation piping it to the refining works in this city. The distance is 25 miles, and the estimated expense is $2,500. There are three refineries in this city with a refining capacity of 150 barrels a day; one of them at present is devoted to making tar. The second one, owned by E. A. Edwards, is running on kerosene and lubricating oil. The kerosene, or burning fluid, is the clearest I ever saw. The lubricating oil is equally fine and is used on sewing machines and other fine machinery. The works at present are turning out five barrels of lubricating oil daily, and from 10 to 20 of kerosene. The capacity is 25 barrels. The third refinery had been running on kerosene but a few weeks and was blown up last Friday. The works somehow got on fire, and the hands in and about the building, perceiving their imminent danger, hastened out and away from the building, and threw themselves flat upon the ground so that the flying missiles passed over their heads when the explosion took place. There was no bodily injury, and the works will be running again in a few weeks.

These oils are heavier and clearer than the Eastern oils; make a better light, and are sold at the works at 15 cents per gallon. All the oils in southern California contain less volatile and explosive matter than the product from any of the Eastern wells, consequently it is more easily refined and safer to use, and is taking the place of Eastern oils in all our Southern towns.

El Dorado County Mines.

A correspondent in the *El Dorado County Republican* of December 11th gives an excellent description of the mines of El Dorado county, particularly of the Pilot Hill mining district, which the writer seems to think is regarded as a lost camp, and undeservedly passed unnoticed by those in quest of mining investments. Little mining is done there now except during the winter months while free water abounds. The outlook for quartz mining is most encouraging, but the total absence of machinery to reduce ore, and the heavily tolled bridges that separate the prospectors from the more favored mining districts across the river, preclude the regular prospecting for quartz by the miner who must work for present returns during the limited period of free water.

An exception to the intermittent character of mining operations is the Boulder mine. Its name was derived from some large quartz boulders found in the claim, from which gold, well into the thousands, was extracted. The formation, cement gravel, round and water worn, from the size of small pebbles to huge boulders (like the bed of a river), has to be worked up by powder previous to hydraulic operations, and the amount of rock to be removed and piled away after every run of water adds much to the expense of working. The claim is peculiar, it varies in depth from the rim rock to 35 or 40 feet of hard cemented gravel, and as there is no other ground of a like description anywhere in the neighborhood, how it came there is a matter of conjecture. It is the opinion that this entire flat at one time formed a part of Pilot Hill, and by some convulsion of nature was dislodged and rolled down to its present position. An immense quartz ledge, corresponding to the huge quartz boulders in the mine, is to be seen on the hill, in a position to carry out this hypothesis.

The Pilot Hill mine is very favorably spoken of. Various auriferous quartz seams run through the location and several shafts have been sunk, from all of which more or less rich ore has been obtained. The main shaft, down about 40 feet, shows two good quartz seams 8 to 12 inches thick, and one smaller one. The country rock is very hard and full of mineral, and a strong body of water exists. This, however, is presumably surface, and can be overcome by drainage, which, from the position of the mine, is attainable. The ore contains a large percentage of rich sulphurets. The owners, Messrs. Mendes, Raimundo and Warner, believe that the various seams converge into a solid ledge at no great depth, and that they have a valuable mine. They can, however, do but little beyond the requisite legal amount of work per annum, to hold their claim, until they can induce capital to aid them in developing it. The ore now lying on the surface would pay $25 or $30 a ton had they any machinery within a reasonable distance to work it. Pilot Hill occupies a large area of mineral ground. At the western base of Pilot Hill lies Cooper's ravine, in which is located a soft chrome mine, with a well-defined ledge some 12 feet thick.

Many fine specimens of gold in quartz, found in the neighborhood of Cooper's ravine, indicate that quartz ledges worth looking for exist in the hills about; and several quartz locations that have been partially prospected, give good encouragement for more practical examination.

The Hunt mine, near Hogg's Diggings, is the only patented mine in the vicinity; it is about four miles north of Pilot Hill, and is owned chiefly by Sacramento people. In early days, up until about 1859, a small and very imperfect stamp mill, on Hogg's Diggings, operated the culled croppings from the ledge (which is well defined for over a mile), and the ore from some few shafts varying from 29 to 40 feet in depth, with an average return of $15 per ton. The owners have done nothing to this property, save keeping trespassers off, since acquiring their title.

Unsorted samples of ore from the Josephine, on Knickerhocker creek, have assayed upward of $25 per ton.

Only a short distance from the Josephine, a good find of very rich gold in quartz was made by Mr. Thos. Stephens and partner, about a year ago; they have since been prospecting for the ledge, and are very sanguine of making a successful mine.

Generally speaking, the miners of this section are not accustomed to quartz mining, but the introduction of mining machinery, and the opening of the mines, would at once introduce the operatives ever ready to attend the excitement of a new development.

Water power can be obtained, and wood is plentiful. The distance from Auburn is 10 miles by the road, and four across the river; from Folsom, 18 miles; from Newcastle, across Rattlesnake Bar bridge, 12 miles, and 18 miles from Placerville, renders Pilot Hill accessible from all points; a daily stage line passes through from Auburn to Placerville. Three good stores, a postoffice, hotel and blacksmith shop form the town which stands in the midst of untold wealth, while each succeeding year finds its old '49 miners getting scarcer and poorer.

ENTOMOLOGICAL SPECIMENS.—To preserve from insect ravages: Place crystals of carbolic acid throughout the cabinets, and the evaporation of the crystals will keep them thoroughly saturated with carbolic acid vapors, which will kill all living insects therein.

MECHANICAL PROGRESS.

An Improved Crushing Mill.

An improved crushing machine for the rapid reduction or pulverization of hard rocks, ores, quartz and other mineral substances for various mining, metallurgical and chemical processes has been designed and is being manufactured by the Savile Street Foundry and Engineering Company, of Sheffield, and it is claimed that it is comparatively independent of massive stone or timber foundation, being self-contained, and that it is subject to no excessive shocks or vibrations as is the case when weighted levers are used to force up the expanding roll, which is the common practice. The pressure necessary for the reduction of any given substance is applied direct through the intervention of india-rubber buffers and washer-plates set up by screws and lock nuts. The pressure may be increased or diminished at will, without stopping the machine; the pressure is rapidly increased as the roll opens, and the closing of the roll is not accompanied by the heavy blow due to weighted levers, whilst the pressure is more constant at all times, and the foundations are relieved of those severe strains due to the rapid rise and fall of the weighted levers, which are constantly altering their position. The raff-wheel elevator used to return the rejected or coarse material after screening, is constructed entirely of wrought-iron instead of wood as heretofore, and is secured directly to the axle of the driving roll. The arms are made of T-iron bars attached to the center boss and the outer rim which carries the internal lifting buckets. These arms are further stiffened and tied together by a wrought-iron ring midway between the boss and rim. The receiving hopper is of wrought-iron plate, divided in the center, and riveted to angle irons in the corners. The crushing rolls, which are 28 inches diameter by 16 inches on the face, are made of chilled iron, and secured to cast-iron centers by projecting ribs and wooden wedges. The material is fed to the rolls by a rotating screen receiving the stone or ore from a stone breaker. The crushed stuff is passed through a rotating screen with an internal perforated steel drum, surrounded by another steel drum, with holes fifty to the square inch. The outer screen is perforated to suit the desired comminution. The framework is of cast iron, and carries all the gearing and shafts in adjustable brass-lined bearings. A massive fly-wheel driving pulley maintains a more even and constant speed of the belt. The belt speed is reduced seventeen times on to the driving roll.

A New Musical Instrument.

A novel musical instrument called the autophone is manufactured by the Autophone Company, of Ithaca, N. Y. It is quite small and is a wonderfully simple instrument for one that accomplishes so much. It requires no special skill to operate it, and one kind of music may be played as well as another.

It consists of an upright rectangular board, having on one side a bellows, and upon the other a flexible air chamber, communicating with a set of reeds in the upper edge of the board. Above the reeds there is an apertured plate, and each reed has an aperture of its own. Above the plate there is a shaft carrying a series of thin disks, which serve to hold the perforated music sheet down upon the apertured plate. The shaft is pressed down at each end by a spring, and carries at opposite ends toothed wheels which engage corresponding perforations in the music sheet.

The music sheet consists of a strip of bristol board having perforations corresponding to the notes to be sounded.

As the music sheet is propelled by the regular working of the bellows, it acts as so many valves controlling the escape of air from the reeds and thus producing music.

The most remarkable feature of this invention is the regularity and perfection with which the music is rendered. All of the parts are played, and the music is of no mean order. While it is a very amusing thing, it is also of very great utility, for those who are without musical talents can play as well as those cultured in the art, and many who would not feel warranted in purchasing an organ or piano can, at a very moderate outlay, provide themselves with both an instrument and a player. It must also prove of great use in schools and other places, as an accompaniment to singing.

Each instrument is provided with a number of perforated music sheets, and we understand that music adapted to the instrument can be furnished at any time.—*Scientific American.*

AN AUTOMATIC ELECTRIC BELL.—An ingenious and simple apparatus for making a bell ring at any predetermined hour of the day, is described in a recent number of *L'Electricite.* It comprises a lens by means of which the solar rays are concentrated and directed on a metallic strip, which is susceptible of very rapid and great dilatation. The result of the dilatation is electric contact, giving passage to a battery current which rings the bell. Although the sun may be covered by clouds, its calorific power is never diminished so much as not to dilate the strip.

Artificial Hay Maker.

The London *Graphic* says that a successful method of artificially drying hay has been long desirable on account of the excessive moisture in the British Isles. Mr. W. A. Gibbs, of Gillwell Park, Chingford, Essex, a gentleman engaged in mercantile pursuits in the city, and also, we may venture to observe, favorably known among the poets of the day, has also devoted much attention to the hay-saving problem. By slow degrees he invented a really practicable process, which is thus described:

"Streams of hot air from the mouth of a hot blast fan, connected with a portable engine, are directed upon masses of wet hay or grain laid in open troughs, and brought in turn, by occasional lifting of forks, under the direct action of the air. By increasing the temperature of the blast it was found that the drying process could be proportionately expedited. Eventually the scheme was perfected by bringing the hot blast fan to bear upon a shed divided into two compartments by an iron partition, and having a space between the iron floor and the ground. Hot air, supplied from the hot-blast fan by means of a duct from an underground furnace, communicates with 32 conical perforated tubes on the floor, on which are spiked the wet corn sheaves. These tubes of course are used only for grain. The crowning success of the whole process is an atmospheric hoist, worked by the same engine as the hot blast, which elevates and sends up to the top of a stack, 22 feet high, as many as 960 sheaves per hour.

This year, owing to the unprecedented wet summer, Mr. Gibbs' invention has come to the front and been recognized by practical men as one of extreme value. He says, in a letter to the *Field;* "On Tuesday in last week I lent one of my hay driers to Mr. Ashcombe, of Sewardstone, a practical farmer of long experience and large 'holding.' He started it at 9 A. M., and in 10 hours had dried and stacked the produce of 10 acres, estimated at 1½ loads per acre. The total cost was £5 10s. for the 10 acres, rather less than it would have cost to make the hay in the field, had that been possible. The hay was made from unripe, rank, weedy grass which had been perpetually rained upon; Mr. Ashcombe and his men were inexperienced in the use of the machine, and had no help from me; the hay drier was wholly uncovered and heavy showers fell on the hay while it was being dried. In spite of these unfavorable conditions, however, the result was a complete success."

DOUBLE-PISTON STEAM ENGINES.—In the improvements invented by Messrs. Thewlis, of Leeds, one cylinder is employed, and in it two pistons are fitted with their respective piston rods. Pressure is admitted between two pistons in order to give an outward movement thereto, the return motion being obtained by admitting pressure on the opposite side of each piston. The crank shaft is connected direct with the piston rod of the nearest piston, and long rods in connection also with the crank shaft are attached to the outside cranks on the same, and coupled to a crosshead on the end of the piston rod of the other or opposite piston. Each piston rod, although moving in contrary directions, tends to give a rotary motion to the crank shaft, the cranks on the shaft for the nearest piston and the furthest piston being opposite to each other. The means for removing the slide valve for admitting the pressure may be of ordinary construction and actuated by some suitable moving part of the engine. The above described arrangements or improvements are applicable not only to stationary, but also to locomotive engines, and by the application thereof higher speeds can be obtained; at the same time a great saving of fuel is effected, and the engine is much less expensive in construction.—*Mining Journal.*

GRINDING WHEAT BY GROOVED ROLLERS.—A German correspondent says the grinding of wheat by grooved rollers is getting more and more preference over the millstones everywhere where hard wheat is to be had. This is also the case in the United States, where in Minneapolis and Milwaukee, millers are going in heavily for the roller system; but for the breaking of wheat, grooved chilled iron rollers will take the lead over other materials. Our correspondent continues: "The new mills of Governor Washburn, that of Messrs. J. A. Christian & Co., of Mr. Archibald, in Dundas, and quite a number of other mills in Minnesota and Wisconsin, are being erected on the pure Hungarian roller principle from the beginning of the grinding process to the end. I am fully convinced that in the next decade the Americans will be at the head of all milling communities, for even the Pesth mills, although their system is very highly developed, are far behind the Americans, with their mill arrangements, their labor contrivances, and their finely-finished machinery."—*Cor. London Miller.*

IMPROVED BICYCLE.—The latest novelty in bicycle appliances is a contrivance known as "The Eucycledian Accelerator," invented and sold by Messrs. Pimtis, of London, England. The proprietore claim that by the use of their patent a bicyclist is capable of traveling at the rate of at least 20 miles an hour with no more exertion than riding 10 miles on an ordinary machine. Another feature of it is that hills are more easily ascended, and riding against a strong wind is rendered a pleasure, in place of what, to an ordinary driver, is very fatiguing. Three stoutish rods are fitted inside the driving wheel by means of a brass collar clamped on the spindle. These rods are screwed down into the collar, and extend to within 12 inches of the rim of the wheel. At the end of each rod is fitted a diamond-shaped piece of lead, weighing about six pounds, secured by a nut; it thus depends on centrifugal force for its power.—*Design and Work.*

SCIENTIFIC PROGRESS.

Edison's Electric Light.

The methods and steps by which Mr. Edison claims to have accomplished the undertaking that had its inception in the electric shops in Ansonia, Conn., is now for the first time made public.

When Mr. Edison received from Ansonia the Wallace dynamo-electric machine, or the telemechon, as Mr. Wallace calls it, he at once began his experiments. The amount of power he recovered in the second machine was so incommensurate with the original power applied to the first machine, and transmitted by a wire, that both machines were cast aside. Then Mr. Edison experimented upon the Gramme, the Brush, and the Siemens machines. These were better, but still the loss of power was excessive. Mr. Edison at once left the beaten track upon which scientists have been toiling for years with unvarying results, and struck out into fields altogether new. Instead of exciting the field magnet by the current from the armature, Mr. Edison charges the field magnet by means of a separate machine. The batteries of these generators are charged by means of a Faradic machine. It does not require more than a minute to charge the immense magnets. The internal resistance of the armature is only $\frac{3}{4}$ ohm.

Mr. Edison's new generator differs essentially from the Gramme, Siemens, Brush and Wallace machines. The field magnets are about 54 inches high, and weigh 1,000 pounds. The magnet cores are of wrought iron. They are 6 inches in diameter and 36 inches long. They are mounted upon heavy cast-iron blocks, 10½ inches high and 9 inches wide and are connected at the top by a wrought-iron yoke six inches high and seven inches wide. The cores are wound with three layers of No. 10 cotton-covered wire, the ends of which are connected with binding posts on the base of the machine. The two blocks upon which the cores rest, as well as the bearings of the armature, are supported by a cross-shaped brass casting.

The armature, revolving in a cylindrical space between the poles of the field magnet, consists of a wooden cylinder mounted on a 1½-inch shaft and having attached to its ends soft iron plates, between which are several layers of No. 20 soft iron wire wound circumferentially. Outside of the iron disks there are vulcanized fiber disks having their peripheries notched to receive the several coils of insulated wire wound lengthwise on the cylinder and connected with copper bars of the commutator cylinder. The field magnet is charged by the aid of a separate machine.

Thus, as it may be seen, Mr. Edison began at the foundation. At first he hoped that the machines already in the market would at least furnish him with sufficient power, and he so expressed himself at the time. His hope proved fallacious. The loss of power was altogether too great for economy. In his new machine Mr. Edison says he recovers 95% in his second machine of the power applied to the first.

After completing his dynamo machine, Mr. Edison began to work upon his electro-motor, for without some kind of a measure he could not tell how much of the electric current was expended at any one point. This was soon done. For nearly eight months he has been experimenting upon the little contrivance that is to furnish the light. First it was made to consist of a small platinum spiral without covering. This would not do, because after the current has been withdrawn oxidation to a greater or less degree set in. Then he made a composition, with lime as a base, and with this he covered the spiral. It was transparent but had defects. Finally he hit upon the expedient of completely covering the platinum with a small glass globe filled with oxygen gas. The globe being air tight there could of course be no combustion. This gave the inventor great satisfaction, but still he experimented, and found that the gas was unnecessary and troublesome in charging, and he rejected it, but retained the sealed globe. Then came the difficulty of preventing the intensity of the current from fusing the platinum. This problem, which has puzzled electricians ever since the first experiments in this direction, was met. A solution was found, after great labor and almost innumerable experiments, by an ingenious device. It is well known that the fusing point of platinum is greater than of any other metal. That is to say, if the temperature be raised about a series of metals, each piece of which is of the same size, the platinum will go last; but a heavy piece of brass, for instance, will stand a greater heat than a piece of platinum one-twentieth its size. This knowledge was made use of by Mr. Edison. In each globe he places a block of brass. When the current is intensified to such an extent as to imperil the existence of the spiral, a brass block immediately underneath expanded by the heat presses upon a lever which connects the shunt with the main line. Now, platinum offering great resistance to the current, and copper of which the shunt is made, offering very little resistance, a certain portion of the current is at once diverted from the spiral, passes along the wire on the circuit, and is thus prevented from accumulating.

Platinum is very expensive now, an ounce costing in the market between $7 and $8. Nevertheless, the spirals, which furnish the illumination through incandescence, are so small that it is thought they will not cost more than fifty cents apiece. The company propose, however, to make the fixtures a part of their plant. Platinum, which comes almost exclusively from Russia, is said to be monopolized by two English firms, who fix the price to suit them. Mr. Edison has had pieces of native ore shown him that was mined in the West, but no considerable quantity has been found.

Photography by Gaslight.

It has often been a subject of comment that while other arts have steadily advanced in development and kept gradually approaching perfection, and in some instances reached it, the art of photography has remained at a comparative standstill. The fact that artificial light has just been called into requisition with the most successful results in connection with it will, therefore, go a great way to remove that apparently well-founded reproach. Experiments in photography by gaslight, by means of the patent burner invented by Mr. Wigham, of the well-known firm of Messrs. Edmundson & Co., of Capel street, Dublin, were made last evening at Mr. McFarland's studio, 79 Grafton street, and certainly they must be described as highly satisfactory in every respect. The idea of utilizing gas in this way originated with Mr. J. McFarland, who, as a practical photographer, has studied every branch of his profession with a closeness and an intensity of interest almost bordering on enthusiasm. The Dublin Alliance Gas Company are also entitled to a share of the credit due to the discovery, for it was by attentively observing the great illuminating power of the lights placed in front of their office in Grafton street that Mr. McFarland's inventive genius was turned into that groove of thought which led to the application of gas to such a useful purpose. Mr. McFarland felt, as everybody in his line of business must feel, how seriously the fickleness of sunlight affected his daily receipts, especially in the winter season. He accordingly placed himself in communication with Messrs. Edmundson & Co., and the adaptation of Wigham's patent burner as an efficient substitute was soon arranged. The appliance is easily described. A truncated cone, containing about 48 ordinary gas burners closely packed together, is placed within a large circular reflector. This cone is surmounted by a false funnel, which, while fireproof, creates a powerful draft. The gas is conducted into the burner through a pipe leading from a carbureter, where it is previously purified, so that when ignited the flame is intensely white. In its passage through the carbureter the gas becomes charged with carbon, and charged increased in illuminating power. The ordinary gas supplied in Dublin is equal to about 16 candles, and by this simple process it is rendered equal to 32 or 33 candles. The saving thus effected in consumption is so considerable that the quantity of gas consumed on "a sitting" is computed to cost a fraction of a penny. The reflector, which is adjusted to turn in any direction, of course is used to cast the light on the face of the sitter, and as the full flame is only required during the brief period of "exposure," as it is technically termed, the waste of gas is inconsiderable. The burners employed are the same as those used in the Howth lighthouse, though of miniature dimensions, and the 48 are equal to about 1,000 candles. By means of this novel contrivance cartes can be taken at any hour, night or day, which is unquestionably an incalculable advantage both to the artists, who will put money in their purse thereby, and to the "photo-loving" public, who will be spared much anxiety and annoyance. The likeness produced by gas-light is quite as good as those produced by the aid of the natural luminary. Another novel idea in this connection must be mentioned, as it bids fair to introduce a little revolution in an important branch of industry. Mr. McFarland is now enabled to produce Christmas and Easter cards, which are veritable photographs, embellished with devices suitable to the particular season. When people receive the "counterfeit presentment" of their friends indelibly imprinted on the customary card, with which we are all so familiar, they are likely to treat the "delicate reminder" with more ceremony than it usually receives.—*Dublin Paper.*

THE ELECTRIC LIGHT IN THE GERMAN ARMY AND NAVY.—The "Year Book for the German Army and Marine," states that the electric light has been employed for military and naval purposes; among others for lighting up the ground lying in front of a besieged fortress, for the illumination of ships at sea, and notably for carrying on work under water. A transparent bell with an electric lamp has been immersed to a depth of 60 meters, while a magnetic electrical machine placed at a distance of 100 meters has been able to maintain a strong, unbroken current, so that a brilliant light was maintained for a long time. The same authority states that experiments are now in course of being carried out for the purpose of testing how far the electric light can be usefully employed in marine warfare, and especially as a defense against torpedo attacks.—*Gaslight Journal.*

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Nov. 26.		Week Ending Dec. 4.		Week Ending Dec. 11.		Week Ending Dec. 18.	
Alpha	12	9½	10	8¾	8½	7⅝	9	8
Alta	4.55	3¾	4	3¼	3.45	2.90	3½	2.60
Andes	1.10	1	1	65c	70c	55c	70c	45c
Alps	....	....	....	....	....	....	....	....
Argenta	95c	80c	95c	85c	1	90c	1½	1
Atlantic	15c	....	10c	5c	5c	....	....	....
Aurora Tunnel	15c	....	....	....	....	....	....	....
Baltimore Con	....	....	....	....	....	....	....	....
Belchor	3.20	2⅜	2.95	2	2	1.40	1.80	1
Belmont	1	90c	1	80c	1.45	90c	85c	50c
Best & Belcher	18⅞	16¼	18½	14	13½	10⅝	11½	8⅝
Bullion	5⅞	4¾	5¼	4.20	4.65	3.45	4.10	3.60
Bechtel	1½	1½	1½	1½	1½	1.40	1.55	1.30
Belle Isle	3.30	2	2.65	1.85	1½	1.40	1⅞	1½
Bodie	12⅝	10¼	10½	9½	9	8⅝	9	8½
Benton	3.10	2.60	2.80	2.15	2	1.10	1⅞	1.45
Bulwer	10¼	9⅝	10	9⅝	10	9¼	9¼	8⅞
Boyle	....	....	....	....	....	....	....	....
Black Hawk	50c	....	25c	20c	40c	20c	50c	25c
Belvidere	50c	....	60c	45c	1	60c	1¼	90c
Booker	85c	75c	85c	75c	70c	55c	70c	50c
Caledonia	1½	1¼	1½	1.05	1.10	50c	1.40	90c
California	5	4.65	4½	3.70	3.85	3½	4.40	3.80
Challenge	2.60	2.20	2.20	1.80	1.80	1½	2	1.55
Chollar	8	7	8	7	6⅞	5⅝	6⅝	5¼
Confidence	10½	9	9½	7	7	5½	8	6¼
Con Imperial	80c	65c	70c	55c	60c	50c	60c	35c
Con Virginia	5¼	5	5½	4¾	4.95	3¾	4.70	3.95
Crown Point	3.05	2½	2.60	2	1.80	1½	2	85c
Con Washoe	....	....	....	....	....	....	....	....
Champion	30c	25c	30c	25c	30c	20c	20c	15c
Concordia	....	....	40c	20c	25c	15c	25c	20c
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	1.20	1.10	1.10	1	1.10	70c	1	60c
Eureka Con	17⅞	16¼	19	16½	24½	17⅞	19½	15⅞
Exchequer	4.30	3¾	4	3.40	3.40	2.60	3.10	2½
Endowment	80c	60c	75c	70c	80c	75c	75c	70c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	1.95	1⅝	1	25c	1	70c	75c	30c
Gila	40c	30c	35c	20c	25c	20c	20c	15c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	....	....	13	12½	12½	12	12	10
Goodshaw	35c	25c	20c	15c	20c	5c	10c	....
Gould & Curry	9⅞	8	8¼	7½	7	5¼	5⅞	4
Hale & Norcross	14¼	13	14½	11	9⅝	7⅛	8½	5¼
Hillside	1.40	80c	1.10	1	1.10	1	1¼	85c
Highbridge	....	....	....	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	20c	....	....	....	....	....	....	....
Independence	60c	75c	80c	70c	60c	40c	75c	....
Julia	2.35	1.80	1.95	1.20	1½	80c	1	50c
Justice	2½	2	2.35	1.60	1.80	1¼	1.40	1
Jackson	....	....	....	....	3½	....	4	3½
Joe Scates	....	....	....	....	....	....	....	....
K K Con	4	....	4	3½	4½	4	6	4½
Kentuck	3⅞	3½	3½	3	3	2.60	3	2½
Kossuth	20c	15c	15c	....	....	....	10c	....
Keystone	3½	....	....	....	....	....	....	....
Lady Bryan	40c	35c	50c	25c	40c	25c	35c	25c
Lady Wash	90c	75c	80c	50c	70c	50c	60c	45c
Leopard	25c	20c	25c	....	15c	5c	15c	....
Leviathan	40c	25c	30c	25c	30c	20c	50c	25c
Leeds	50c	40c	50c	40c	40c	...	55c	40c
Lee	....	....	....	....	....	....	....	....
May Belle	25c	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	2½	2.10	2	....	1⅞	....	1½	....
Martin White	1½	1.10	1	80c	1⅞	85c	90c	50c
McClinton	50c	40c	45c	40c	40c	35c	50c	35c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	29	23½	21½	20	22½	18	20	16
Mides	....	....	....	....	....	....	....	....
Morning Star	5	....	....	....	....	....	....	....
North Con Virginia	10¼	10	10¼	....	....	....	....	....
New York	50c	20c	45c	30c	35c	30c	35c	25c
Northern Belle	6⅞	6½	6¼	6	6¼	6½	6½	5⅞
New Coso	....	....	....	....	....	....	....	....
Navajo	50c	35c	30c	25c	30c	25c	30c	25c
Occidental	1¼	1	2	1½	1½	85c	1	90c
Ophir	30	26	26⅞	22½	25	21	21⅞	18
Oriental	15c	5c	....	....	35c	5c	35c	25c
Overman	8¼	6⅝	7	5⅝	5⅝	4¼	4⅝	3⅞
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	....	....	....	....
Phil Sheridan	25c	20c	25c	20c	25c	20c	25c	20c
Potosi	4.90	4½	4.55	3.60	4.05	2.60	3.65	2¾
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	1.10	1	1	....	1	50c	1	75c
Richer	....	....	5	....	....	....	....	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	11⅝	9⅝	10¼	7⅝	8	6¼	7	4.05
Seg Belcher	15	12	16	15	13½	13	15	10
Sierra Nevada	45	37½	39⅝	39	34½	24½	28	20½
Silver Hill	1½	1¼	1.35	1	1	65c	1	70c
Silver King	....	....	5	4	5½	4	4	3⅝
Silver Prize	....	....	....	....	....	....	....	....
Succor	....	....	20c	....	....	....	....	....
Summit	1.20	90c	1.10	80c	90c	60c	75c	50c
Scorpion	3.85	2½	3.10	1.95	3½	2½	2.95	2½
Solid Silver	....	....	35c	....	35c	....	20c	10c
South Bodie	30c	20c	25c	15c	15c	10c	25c	....
South Standard	15c	....	....	....	25c	....	....	....
Star	35c	25c	25c	20c	20c	15c	20c	....
St. Louis	....	....	....	....	....	....	....	....
Syndicate	3.10	2.90	3	2	3½	2.20	2⅞	2⅝
Tioga Con	2½	2	2½	2	2	1.65	1.90	1.80
Tiptop	1.60	1½	1⅞	1.65	1.90	1.70	2	1.80
Trojan	10c	....	10c	5c	5c	....	....	....
Union Con	60	43⅞	61	45⅞	57½	44⅞	46	39
Utah	17⅞	14⅞	16	14	13½	10	12	9½
Vermont Con	....	....	....	....	....	....	....	....
Ward	1.90	1.35	1½	1.20	1.30	1	1.30	1
Wells-Fargo	5c	....	5c	....	....	....	....	....
Woodville	25c	20c	20c	15c	15c	....	....	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	15⅝	13	13⅞	11⅞	10½	8⅞	10½	8¼

Sales at S. F. Stock Exchange.

Friday A. M., Dec. 12.

50 Alpha...8¾
220 Alta...3.20@3¼
220 Andes...85c
130 Bullion...4@4.10
530 Belcher...1½@1.55
75 Best & Belcher...11½
535 Benton...1⅝@1.70
350 California...3.80@3⅞
140 Con Virginia...4.20@4½
80 Chollar...6½@6⅝
100 Confidence...8
595 Caledonia...1.20@1.25
570 Con Imperial...55@50c
140 Crown Point...1¼@1.35
10 Challenge...2
200 C Dorado...2
630 Exchequer...3@3.60
200 Flowery...10c
550 Golden Gate...1.15
245 Gould & Curry...5⅞
145 Hale & Nor...8⅝@8¼
835 Julia...95c@1
400 Justice...1.30@1½
40 Kentuck...3
120 Leviathan...30c
240 Lady Bryan...30@35c
250 Lady Wash...60@50c
710 Mexican...19@19½
1850 Mackey...10c
400 Mountain View..1.30@1½
175 New York...30@35c
400 N Bonanza...50c
650 Ophir...20¼@21½
1500 Occidental...90c@1
1200 Overman...4⅝@4½
40 Potosi...3½
100 Phil Sheridan...25c
570 Silver Hill...90c@1
225 Scorpion...2.95
145 Savage...6⅞@6⅝
635 Sierra Nevada...26@28
50 Utah...11⅞@11⅞
775 Union Con...4.@45½
100 Ward...1.10
215 Yellow Jacket...10@9⅞

AFTERNOON SESSION.

1150 Albion...40@45c
350 Addenda...50c
1300 Argenta...1⅛@1.05
50 Belmont...50c
100 Boston...1.40
400 Booker...70@65c
305 Belvidere...90@95c
250 Black Hawk...25c
140 Bulwer...9@8⅞
585 Belle Isle...1⅞@1.60
20 Bodie...8⅞
285 Bechtel...1.30@1.40
20 C Pacific...4½
575 Day...80c
300 Dudley...50c
20 Eureka Con...19
100 Endowment...75c
200 Giant & O A...5
585 Grand Prize...70@75c
1480 Hillside...1¼@1.10
350 Independence...75c
50 Jackson...3½
540 Jupiter...75c@1
270 K K Con...4½
200 Leopard...15c
100 Leeds...50c
600 Martin White...90@80c
110 Mono...3.80
40 McClinton...35c
200 Mammoth...3⅝
200 Metallic...70c
1350 Navajo...30c
290 Noonday...4@3.95
370 N Noonday...3¼@3½
240 Northern Belle...6@6⅛
175 Oriental...35@30c
560 Paradise...80@75c
200 Queen Bee...35c
400 Real del Monte...1.40
250 Ray'd & Ely...75c
875 Silver King...4
100 S Noonday...1.60
250 S Bulwer...60c
650 Star...20c
250 S Bodie...25c
15 Syndicate...2½
250 Summit...50@55c
2080 Tiptop...1.80@2
550 University...20@25c
100 W Pacific...30c
120 Wales...3½@3.15

Saturday A. M., Dec. 13.

90 Alpha...8⅝
520 Andes...70@60c
390 Alta...3½@3½
500 Argenta...1.05
100 Albion...35c
205 Belcher...1.55@1½
390 Bullion...4@4.10
200 Benton...1⅞
265 Best & Belcher..11½@11⅞
300 Belmont...80@75c
130 Bechtel...1.35@1½
395 Bodie...8½@9
935 Belvidere...1
130 Bulwer...9
65 Black Hawk...25@30c
100 Boston...1¼@1.30
10 C Pacific...4½
670 Chollar...6⅞
425 Crown Point...1.20@1.35
55 Confidence...7⅞
320 California...3.85@3.90
295 Con Virginia...4.40@4½
660 Caledonia...1¼@1.40
80 Challenge...1.90@2
1930 Con Imperial...60@50c
1200 Con Dorado...1.30@1½
100 Concordia...20c
600 Champion...20c
305 Caledonia (B H)...3½
50 Day...90c
135 Exchequer...3¼@3.10
200 Eureka Con...19¼@19½
400 Endowment...75c
1350 Flowery...10c
160 Gould & Curry...5⅞
400 Golden Gate...1.15
170 Grand Prize...70c
50 Golden Terra...10
500 Giant & O A...5½
230 H & Norcross...8½@8⅝
50 Hillside...1.20
455 Julia...90c@1
230 Justice...1.35@1.40
100 Jupiter...1½
150 Kentuck...3
100 Kossuth...10c
150 Leviathan...30c
1115 Lady Bryan...35@30c
100 Leeds...55c
1000 Mexican...19⅝@20
2530 Mackey...10c
100 Mount View...1¼@1.20
50 Metallic...75c
100 McClinton...40@35c
600 M White...75@70c
30 Mono...3.85
560 New York...30c
800 N Bonanza...50@45c
655 Navajo...30c
425 Noonday...4
220 N Noonday...3½
105 Ophir...21½@21⅞
230 Overman...4¼@4.30
170 Occidental...95c@1
100 Orient...15c
310 Potosi...3.60@3.65
500 Phil Sheridan...25c
200 Paradise...75c
325 Raymond & E...75c
125 Real Del Monte.1.40@1½
520 Silver King...3⅞@4
205 Sierra Nevada...27⅞@27¼
155 Savage...7@6⅞
10 Seg Belcher...13
515 Scorpion...2.85@3
370 Silver Hill...90@85c
500 Star...20c
200 Summit...65@70c
30 Syndicate...2½
250 S Noonday...1.60@1.70
370 S Bulwer...60c
25 Tioga...1.85
615 Tiptop...2
30 Utah...11⅞@12
425 Union Con...44⅞@45
300 University...20c
100 Ward...1.15
180 Wales...3.10@3
275 Yellow Jacket...10⅞@10½

Monday A. M., Dec. 15.

55 Alpha...8
275 Alta...3¼@3
250 Andes...65@70c
685 Best & Belcher...10½@10¼
255 Belcher...1.15
385 Bullion...4@3.95
430 Benton...1.60@1⅞
1195 California...4¼@4.40
210 Confidence...7@6½
340 Crown Point...1½@1.20
230 Chollar...6
150 Challenge...1⅞@1.80
315 Caledonia...1.30@1.20
330 C Dorado...1.30
180 Con Virginia...4.70@4⅝
495 Con Imperial...50c
200 Dardanelles...80c
190 Exchequer...3@3.10
200 Flowery...35c
240 Gould & Curry...5½@5⅛
400 Golden Gate...1.10
995 Hale & Nor...6@5⅞
515 Julia...85@80c
715 Justice...1¼@1
220 Kentuck...3@2⅞
135 Leviathan...30c
40 Lady Bryan...30c
950 Lady Wash...50c
580 Mexican...19
700 Mackey...10c
150 Mt View...1.10@1
300 New York...35c
405 Ophir...21@21⅞
350 Overman...4.30@4¼
100 Occidental...95@90c
100 Potosi...3.2½
640 Savage...4.90@4⅞
70 Seg Belcher...13@12
270 Sierra Nevada...25⅞@26¼
250 Silver Hill...80c
2000 Solid Silver...10c
330 Scorpion...2.85@2⅞
265 Union Con...44½@43⅞
125 Utah...10½@10⅞
700 Ward...1.10
1030 Yellow Jacket...9¼@9⅝

AFTERNOON SESSION.

2360 Argenta...1.05
180 Addenda...50c
300 Albion...35@40c
90 Belle Isle...1.60
115 Bodie...8⅞@8½
150 Bulwer...9½
1150 Belmont...75c
610 Bechtel...1½@1.55
50 Booker...70c
1050 Belvidere...1.10@1¼
170 Black Hawk...45@40c
350 Caledonia (B H)...3½
70 Champion...20c
115 C Pacific...4
50 Dudley...40c
650 Day...90@95c
50 Eureka Con...18½
250 Endowment...70c
490 Grand Prize...50@60c
900 Gila...20c
400 Golden Terra...12
400 Goodshaw...10c
425 Hillside...1
425 Jupiter...1.40@1.30
50 Leeds...40c
10 Mammoth...4
100 M White...55c
100 Mono...3.90
60 Mt Diablo...10½
100 McClinton...50c
50 Metallic...75c
95 Northern Belle...6@5⅞
255 Noonday...4
950 Navajo...30c
50 Oriental...30c
50 Orient...25c
85 Paradise...75c
200 Queen Bee...35c
200 Raymond & E...75@85c
350 S Bulwer...50c
400 S Noonday...1.65@1.70
100 Silver King...4
100 Syndicate...2⅜
300 Star...20c
50 Summit...60c
50 Tioga Con...1.90
1000 Tiptop...2
130 Wales...3.10@3.20

Tuesday A. M., Dec. 16.

270 Andes...60c
705 Alta...3@2.80
285 Alpha...8@8½
1215 Belcher...1.05@1
920 Best & Belcher...8⅞@9⅛
310 Bullion...3.60@3.70
585 Benton...1.60@1½
400 Con Dorado...1.30
735 California...4.10
500 Con Virginia...4⅛@3.95
285 Chollar...5¼@5⅛
1000 Con Imperial...45@40c
325 Confidence...6½
830 Crown Point...85@90c
725 Caledonia...1.05@95c
525 Challenge...1⅝@1.55
150 Dardanelles...80c
325 Exchequer...2½@2.70
700 Flowery...30@25c
490 Gould & Curry...4¼@4
275 Golden Gate...1.10
815 H & Norcross...5¼@5⅝
515 Justice...1.10@1.15
790 Julia...60@50c
460 Kentuck...3@2⅞
1400 L Bryan...25c
430 Lady Wash...45@50c
985 Mexican...17@16⅞
2300 Mackey...10c
150 Mt View...1
250 N Bonanza...35c
250 Occidental...90c
85 Overman...3⅞@3.90
275 Ophir...21@20½
425 Potosi...2⅞@2.80
10 Seg Belcher...10
550 Savage...4¼@4.05
785 Sierra Nevada...23@23½
480 Silver Hill...80@70c
880 Scorpion...2.60@2½
250 Solid Silver...20c
295 Utah...10
800 Union Con...39@40½
510 Ward...1.10@1
735 Yellow Jacket...6¼@8⅞

AFTERNOON SESSION.

2220 Argenta...1.05
450 Albion...40c
1530 Addenda...45@50c
500 Atlas...20c
380 Belle Isle...1¼@1.55
215 Bechtel...1.40@1½
120 Bodie...9
1075 Belvidere...1.20@1
70 Booker...55@60c
270 Black Hawk...50c
50 Boston...1½
100 Champion...20c
90 C Pacific...4@3½
110 Caledonia (B H)...3.40
615 Day...90c
150 Dudley...15@20c
710 Eureka Con...16
350 Endowment...70c
940 Grand Prize...50@30c
150 Goodshaw...10c
300 Giant & O A...5½
380 Hillside...90c@1
375 Jupiter...1¼@1.35
75 K K Con...6
200 Leopard...15c
100 Metallic...75c
50 Manhattan...1½
300 McClinton...45c
100 Mt Diablo...11
135 Mono...3⅞@3½
610 Mammoth...3¼@3⅞
650 Martin White...70@75c
320 Northern Belle...4
400 Navajo...30@25c
90 Noonday...4@4½
370 N Noonday...3½
150 Oriental...25@30c
100 Orient...25c
100 Paradise...65c
100 Queen Bee...35c
300 Star...20c
390 Summit...60@75c
140 Syndicate...2⅜
150 S Bulwer...55c
100 S Bodie...25c
100 Silver King...4
300 S Noonday...1.80
265 Tioga...1.85@1.90
730 Tiptop...2@1.90
850 Wales...3½

Wed'sday, A. M., Dec. 17.

225 Alpha...9@8⅞
245 Alta...2.65
620 Andes...60@55c
270 Bullion...4.10
570 Belcher...1.05@1
220 Best & Belcher...10@9⅞
145 Benton...1.60
700 C Dorado...1.40@1.35
265 California...4.05
1000 Con Imperial...40c
1100 Crown Point...95c@1
245 Con Virginia...4.15
350 Chollar...5½@5⅞
250 Caledonia...1 05@1
350 Challenge...1⅝@1.65
80 Confidence...6⅞
200 Dardanelles...85c
400 Exchequer...2.80@2.85
205 Flowery...25c
925 Gould & Curry...4.60@4½
250 Golden Gate...1.10
1275 Hale & Nor...6¼@6
625 Julia...75@70c
840 Justice...1.10@1
35 Kentuck...2⅞@2.80
150 Leviathan...25c
375 Lady Wash...50c
720 L Bryan...25c
610 Mexican...17⅞@17⅝
1450 Mackey...10c
725 N Bonanza...30@35c
1500 New York...35@30c
175 Ophir...21@20⅞
240 Overman...4@3.90
50 Occidental...95c
200 Phil Sheridan...20c
155 Potosi...3.15@3.05
375 Sierra Nevada...24@24½
300 Silver Hill...80@75c
1275 Savage...4.80@5
245 Scorpion...2.60@2½
25 Seg Belcher...14@15
705 Union Con...42@42⅞
130 Utah...11
265 Ward...1.30@1¼
180 Yellow Jacket...9⅝

AFTERNOON SESSION.

970 Argenta...1.10@1
650 Albion...40@50c
600 Addenda...45@50c
25 Bulwer...9½
10 Boston...1.20
30 Black Hawk...50@40c
110 Belvidere...1
25 Booker...50c
500 Belmont...75@85c
360 Belle Isle...1⅝@1.55
500 Champion...20@15c
100 Concordia...25c
50 Caledonia (B H)...3½
60 Con Pacific...4
1060 Day...95c@1
170 Dudley...25c
50 Eureka Con...15⅞
200 Endowment...70c
50 Golden Terra...12
100 Giant & O A...5
650 Grand Prize...50c
200 Gila...15c
300 Hillside...90@85c
25 Independence...75c
150 Jackson...4
380 K K Con...6
450 Metallic...70c
100 M White...50c
250 Mammoth...3⅝
30 Mono...3⅞
10 Manhattan...1½
150 McClinton...45c
320 Noonday...4½@4.80
150 Northern Belle...6@6½
280 Navajo...25c
200 Orient...20c
400 Oriental...25@30c
130 Paradise...60c
150 Raymond & E...95c@1
15 Silver King...4
490 Summit...60@70c
140 Star...20c
305 Syndicate...2½
100 S Noonday...1.85
500 Tiptop...2
175 Tioga Con...1.85@1.80
70 Wales...3.70

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S. F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Addenda G & S M Co	California	2	20	Dec 10	Jan 14	Feb 3	T H Dixon	238 Montgomery st
Alpha Con M Co	Nevada	11	1 00	Nov 26	Dec 30	Jan 20	Wm Willis	309 Montgomery st
Alta S M Co	Nevada	16	50	Dec 18	Jau 22	Feb 10	W H Watson	302 Montgomery st
Aurora Tunnel & M Co	California	4	10	Nov 13	Dec 15	Jan 3	C V Hubbard	203 Bush st
Belcher S M Co	Nevada	20	1 00	Nov 17	Dec 23	Jan 13	Jno Crockett	203 Bush st
Belmont M Co	Nevada	22	95	Nov 4	Dec 8	Dec 29	J W Pew	310 Pine st
Best & Belcher M Co	Nevada	16	1 00	Nov 5	Dec 29	Jan 19	Wm Willis	309 Montgomery st
Black Hawk G M Co	California	7	25	Nov 14	Dec 18	Jan 7	H A Charles	419 California st
Caledonia S M Co	Nevada	29	50	Nov 10	Dec 16	Jan 6	R Wegener	414 California st
Con. Imperial M Co	Nevada	10	20	Dec 10	Jan 14	Feb 4	W E Dean	203 Bush st
Curtis Con M Co	Nevada	2	05	Nov 21	Dec 24	Jan 12	H S Stone	419 California st
Crown Point G & S M Co	Nevada	39	1 00	Nov 17	Dec 22	Jan 12	Jas Newlands	203 Bush st
Defiance G M Co	California	4	30	Nov 12	Dec 17	Jan 6	W H Lent	309 Montgomery st
Double Standard M Co	California	2	15	Dec 10	Jan 14	Feb 4	W H Lent	309 Montgomery st
Dudley M Co	California	6	25	Nov 19	Dec 20	Jan 16	E C Masten	309 Montgomery st
El Tesoro	California	8	25	Dec 15	Jan 30	Feb 16	W H Chickering	214 Sansome st
Flowery M Co	Nevada	3	25	Nov 14	Dec 19	Jan 7	W W Stetson	309 Montgomery st
Gen'l Thomas M & M Co	Nevada	5	25	Nov 3	Dec 8	Dec 29	Wm Willis	309 Montgomery st
Goodshaw M Co	California	2	25	Nov 24	Jan 5	Feb 2	V Fernbach	327 Pine st
Grand Prize M Co	Nevada	3	75	Nov 25	Dec30	Jan 20	E M Hall	327 Pine st
Hillside M & M Co	Nevada	1	50	Nov 21	Dec 24	Jan 13	F Frankenthal	330 Pine st
Independence M Co	Nevada	4	25	Nov 15	Dec 18	Jan 8	E M Hall	327 Pine st
Indian Queen M & M Co	Nevada	2	10	Nov 6	Dec 20	Jan 10	A K Durbrow	309 Montgomery st
Julia Con M Co	Nevada	10	1 00	Nov 19	Dec 24	Jan 16	H A Charles	419 California st
Jupiter M Co	California	6	35	Nov 12	Dec 15	Jan 8	E C Masten	309 Montgomery st
Justice M Co	Nevada	30	50	Nov 29	Jan 3	Jan 24	R E Kelly	419 California st
Mammoth M Co	California	3	1 00	Dec 5	Jan 15	Feb 13	A W Field	302 Montgomery st
Martin White M Co	Nevada	5	50	Dec 10	Jan 12	Feb 3	J J Scoville	309 Montgomery st
McCrackin Con M Co	Arizona	4	25	Nov 17	Dec 24	Jan 20	A Wenzelburger	216 Sansome st
Mexican G & S M Co	Nevada	9	2 00	Nov 7	Dec 11	Dec 31	C L McCoy	203 Bush st
North Bonanza M Co	Nevada	4	25	Nov 21	Dec 26	Jan 15	W W Stetson	309 Montgomery st
Northern Belle Isle M Co	Nevada	1	10	Nov 8	Dec 11	Dec 31	E M Hall	327 Pine st
North Carson S M Co	Nevada	9	25	Dec 13	Jan 15	Feb 5	O Betts	113 Leidesdorff st
Occidental Con G M Co	California	3	10	Nov 10	Dec 20	Jan 10	W T Smith	402 Montgomery st
Oriental Con G & S M Co	California	5	25	Nov 8	Dec 10	Dec 27	H C Hinman	411 California st
Overman S M Co	Nevada	44	2 00	Nov 25	Dec 31	Jan 21	Geo D Edwards	414 California st
Potosi M Co	Nevada	2	50	Nov 4	Dec 9	Dec 30	W E Dean	203 Bush st
Real del Monte M Co	Nevada	9	25	Dec 1	Jan 3	Jan 24	C V D Hubbard	203 Bush st
Savage M Co	Nevada	40	1 10	Nov 9	Jan 2	Jan 22	E B Holmes	309 Montgomery st
Seg Belcher M Co	Nevada	16	3 00	Oct 31	Dec 5	Dec 26	Geo D Edwards	414 California st
Sierra Nevada S M Co	Nevada	60	2 00	Oct 31	Dec 4	Dec 24	W W Stetson	309 Montgomery st
Tioga Con M Co	California	8	20	Nov 26	Dec 31	Jan 21	W H Lent	309 Montgomery st
Utah S M Co	Nevada	28	2 00	Dec 18	Jan 21	Feb 9	G C Pratt	309 Montgomery st
Wells Fargo M Co	Nevada	13	10	Nov 17	Dec 22	Jan 9	D L Thomas	10 Leidesdorff st
Ward G & S M Co	Nevada	5	40	Dec 10	Jan 16	Feb 5	Jacob Stadtfeld	419 California st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Aurora M Co	California	1	10	Dec 3	Jan 3	Jan 18	P Conklin	28 Sansome st
Butte Hydraulic M Co	California	—	10 00	Oct 31	Dec 2	Dec 22	L L Dennery	220 Sansome st
Cataract & Wide West H M Co	Cal	—	25	Nov 15	Dec 22	Jan 12	Wm B Lake	26½ Kearny st
Chollar M Co	Nevada	—	50	Nov 4	Dec 9	Dec 29	W E Dean	203 Bush st
Eagle O & S M Co	California	1	10	Dec 6	Jan 6	Jan 22	F W Utter	112 Leidesdorff st
Favorite G & S M Co	Nevada	1	01	Dec 6	Jan 7	Jan 23	Julius Peters	121 Sansome st
Florida Hill M Co	Idaho	1	10	Oct 31	Dec 5	Dec 30	R Wegener	414 California st
Hazard Grav M Co	California	4	03	Dec 2	Jan 5	Jan 25	J T McGeoghehan	318 Pine st
Headlight M Co	California	1	15	Dec 4	Jan 17	Feb 12	A W Field	302 Montgomery st
J & K G M Co	California	1	15	Sept 29	Dec 18	Jan 8	W H Lent	309 Montgomery st
Maybelle Con M Co	California	4	05	Dec 13	Jan 19	Feb 10	W J Taylor	310 Pine st
Morgan M Co	California	5	30	Nov 13	Dec 23	Jan 15	J J Raphael	533 Kearny st
Northern Light G & S M Co	Cal	5	10	Nov 5	Dec 8	Dec 26	F S Monroo	310 Pine st
Numa M Co	Nevada	2	02	Oct 23	Dec 22	Jan 12	D Wilder	328 Montgomery st
Quartz Mountain G M Co	California	8	50	Dec 1	Jan 5	Jan 26	E Hestres	729 Montgomery st
Quinn M Co	California	—	25	Nov 15	Dec 19	Jan 7	T J Blakeney	Palace Hotel
Revenue M Co	Nevada	1	50	Nov 26	Dec 29	Jan 23	A J Bunner	411½ California st
San Xavier M & S Co	Arizona	1	25	Oct 14	Dec 1	Dec 22	F A McGee	32 Merchants' Ex
Summit G M Co	California	4	30	Nov 17	Dec 22	Jan 12	W H Lent	309 Montgomery st
Telfair M Co	Arizona	1	02	Nov 12	Dec 20	Jan 15	J Pentecost	702 Market st
Tellurium G & S M Co	California	20	10	Dec 3	Jan 7	Jan 29	J M Litchfield	415 Montgomery st
University G M Co	California	4	15	Nov 10	Dec 13	Jan 3	W L Oliver	328 Montgomery st
Wide Awake P & M Co	Arizona	8	03	Oct 11	Nov 11	Dec 11	C Hildebrandt	232 Sutter st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Eagle C & S M Co	California	F W Utter	112 Leidesdorff st	Annual	Jan 5
Leopard M Co	California	E M Hall	327 Pine st	Annual	Dec 29
Last Chance M Co	——	T A White	113 Leidesdorff st	Stockholders	Dec 19
Northern Light G & S M Co	——	F S Mouroo	310 Pine st	Annual	Jan 5
St Patrick Con G M Co	——	Jas Mason	Merchants' Ex	Annual	Dec 24

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Belle Isle M Co	Nevada	R H Brown	S F Stock Ex	75	Nov 5
Bodie Con M Co	California	W H Lent	Nevada Block	50	Jan 2
California M Co	Nevada	C P Gordon	Nevada Block	50	Dec 22
Con Virginia M Co	Nevada	A W Havens	Nevada Block	50	Dec 23
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	2 00	Dec 20
Father De Smet Con M Co	Black Hills	Theo Widmann	404 Montgomery st	30	Dec 24
Ophir S M Co	Nevada	C L McCoy	203 Bush st	1 00	Dec 12
Pioneer M Co	California	J W Pew	310 Pine st	08	Oct 6
Standard Con M Co	California	Wm Willis	309 Montgomery st	50	Dec 12

SALES OF LAST WEEK AND THIS COMPARED

Thursday A.M., Dec. 11.

30 Alpha...6
495 Alta...3.20@3¼
160 Andes...70c
375 Best & Belcher...11⅞
450 Bullion...4¼@4.05
1050 Belcher...1¼@1.40
300 Benton...1.70@1⅞
335 California...3.70@3⅞
820 Con Virginia...4.10@4¼
260 Chollar...6⅞@6¾
785 Crown Point...1.30@1½
40 Confidence...7
1055 Caledonia...1.10@1
350 Con Dorado...1.35
150 Dardenelles...80c
245 Exchequer...3@2.95
100 Flowery...10c
490 Gould & Curry...6@5⅞
650 Golden Gate...1.15
210 Hale & Nor...8½@8⅝
450 Julia...1
305 Justice...1.30
175 Kentuck...3
400 Lady Bryan...30c
200 Lady Wash...60c
200 Leviathan...30@25c
710 Mexican...19⅞@20
2700 Mackey...10c
430 Mt View...1@1½
550 New York...30c
425 N Bonanza...45@50c
265 Ophir...22@22½
210 Overman...4½@4¼
710 Potosi...3.60@3½
50 Phil Sheridan...25c
155 Savage...7@6⅞
650 Sierra Nevada...28@28½
20 Seg Belcher...13
360 Silver Hill...80@90c
935 Scorpion...2.90@3
50 Senator...10c
185 Utah...12¼@12⅞
820 Union Con...47½@48
190 Ward...1.15
120 Yellow Jacket...10¼@10½

AFTERNOON SESSION.

820 Argenta...1@1.05
550 Albion...45c
360 Addenda...50c
200 Altas...25c
140 Belvidere...95@90c
30 Belmont...1
250 Black Hawk...25c
100 Booker...55c
200 Bulwer...9@8½
110 Bodie...8⅛@8⅝
255 Belle Isle...1⅞
610 Bechtel...1½@1.15
75 Caledonia (B H).3.40@3½
250 Concordia...10c
60 C Pacific...4½
1720 Day...85@75c
75 Dudley...50c
60 Eureka Con...18@18¼
750 Endowment...75c
250 Golden Terra...10½
250 Goodshaw...15@10c
150 Grand Prize...75c
200 Gila...20c
505 Hillside...1.05@1.15
960 Independence...85c@1.10
125 Jupiter...1
20 Jackson...3½
150 K K Con...4@3⅞
935 Martin White...90c@1
90 Mt Diablo...11½@11¼
120 Mammoth...3½
75 Mono...4
30 McClinton...35c
370 N Noonday...3
140 Noonday...3.90@3.95
300 Navajo...30c
95 Northern Belle...6¼@6⅛
150 Oriental...35c
75 Paradise...70@75c
300 Real del Monte...1.40
120 Raymond & E...70c
100 Richer...5c
250 S Bulwer...55@50c
225 Syndicate...2¼@2.55
110 Summit...60@50c
400 Star...20c
555 Tioga Con...1⅞@1.80
705 Tiptop...1⅞@2
1650 University...25@20c
200 Wales...3¼@3.15

Thursd'y A. M., Dec. 18.

130 Andes...60@45c
225 Alpha...8¼@8
290 Alta...2.65@2.60
305 B & Belcher...9@9¼
850 Belcher...1.60@1.80
735 Bullion...3⅞@3.60
1400 Benton...1¼@1.45
710 Con Virginia...4@3.95
555 Chollar...5½@5¼
675 Crown Point...1.90@2
725 California...4@3.95
590 Con Imperial...40@35c
55 Confidence...6½
720 Caledonia...95@90c
215 Challenge...1.60@1.70
2500 C Dorado...1¼@1
100 Dardanelles...80c
405 Exchequer...2.60@2.70
200 Flowery...25c
280 Gould & Curry...4.40@4¼
150 Golden Gate...1.10
605 Hale & Nor...5⅞@6
1010 Justice...1@1.05
735 Julia...60@55c
165 Kentuck...2⅞@2½
750 Lady Bryan...25c
200 Lady Wash...50c
50 Leviathan...25c
910 Mexican...16@16½
150 Mt View...1
650 Mackey...10c
300 New York...25c
495 N Bonanza...25@30c
630 Ophir...18½@18
550 Overman...4@3.90
50 Occidental...90c
530 Potosi...3@2.90
830 Savage...4.60@4½
1370 Sierra Nevada...21@20½
75 Seg Belcher...11@12
425 Silver Hill...70@80c
245 Scorpion...2.55
190 Utah...9⅞@9⅝
1515 Union...40@39
200 Ward...1
770 Yellow Jacket...8½@8⅞

AFTERNOON SESSION.

650 Addenda...40c
500 Atlas...20c
1520 Argenta...1.05@1
600 Albion...45c
115 Black Hawk...50c
320 Bodie...8⅞@8½
905 Booker...50@40c
835 Belmont...70@80c
170 Belle Isle...1.55@1½
450 Bechtol...1.15@1¼
780 Belvidere...80@70c
30 Boston...1.20
800 Caledonia (B H)...3½@3
220 C Pacific...5
100 Champion...15c
430 Dudley...25@40c
90 Day...95c
105 Eureka Con...16
50 Endowment...65c
110 Grand Prize...40c
225 Goodshaw...5c
100 Giant & O A...5
300 Golden Terra...12½
2040 Hillside...1
20 Independence...75c
500 Jupiter...1.30@1½
5 K K Con...6
300 Leopard...15c
100 Martin White...55c
150 Metallic...65c
190 Mono...3@3½
430 Manhattan...1.60@1.70
830 Mammoth...2½@3
100 Mt Diablo...11
275 McClinton...30@40c
100 Noonday...4½@4¼
225 N Noonday...3¼
400 Navajo...25@20c
600 Orient...20c
125 Raymond & Ely...90c
100 Richer...5c
150 Star...20c
825 Summit...75@85c
70 Syndicate...2½
200 S Noonday...1⅞
285 S Bulwer...50c
100 Silver King...4½
770 Tioga Con...1⅞@1.80
300 Tiptop...2@1.80
50 University...15c
270 Wales...4

Pacific Board—Latest Sales.

Wed'sday A.M., Dec. 17.

170 Alpha...8¼@8⅞
110 Andes...55@50c
100 Alta...2.95
30 Benton...1.60
250 Best & Belcher...10@9⅞
310 Bullion...3⅞@3.90
20 Belcher...1
400 Con Imperial...40c
80 Chollar...5⅞
150 Colorado...2
40 Con Virginia..4.10@4.15
275 Caledonia...1
420 Crown Point...90@95c
250 Gould & Curry...4⅝@4.65
285 Hale & Nor...6@6⅞
5 Julia...70c
260 Justice...1.10@1.05
60 Mexican...18@17½
10 Ophir...21
150 Potosi...3.05@3
90 Savage...4.90@4⅞
150 Scorpion...2.60
330 Silver Hill...80@75c
100 S Nevada...24⅞@23⅞
30 Union...43@41½
20 Utah...10@10⅞
95 Ward...1.20
60 Yellow Jacket...9@9⅛

AFTERNOON SESSION.

2450 Atlas...17@20c
250 Belcher...75c
60 Benton...1.60
20 Bullion...3.95
60 Caledonia...1
20 California...4.05@4⅛
330 Con Imperial...40@37½c
150 Crown Point...95c
20 Chollar...5⅞
50 Eureka Con...16
100 Endowment...70c
150 Gould & Curry...4.85@4⅞
80 Hale & Nor...6.70
100 Julia...70c
100 Lady Wash...50c
80 Mexican...17½
20 N Bonanza...40c
60 Ophir...20⅝@20
120 Potosi...3.10
10 Savage...5⅞
10 Union Con...43
10 Utah...10⅞

California Board—Latest Sales.

Wed'sday A. M., Dec. 17.		50 Alta	2.95@2.85
25 Alpha	.8¼	165 Argenta	1.05
70 Alta	.36@2.95	130 Andes	.60@.57½c
130 Argenta	1.05	5300 Atlas	.8@25c
2700 Atlas	.23@18c	75 Belcher	1
70 Belcher	1.05	130 Bullion	3.80
30 Best & Belcher	.10@10½	30 Best & Belcher	.94
60 Bullion	4@4.05	800 Black Hawk	.37@35c
150 Benton	1½@1.55	30 California	4.05
40 California	4.10	50 Con Virginia	4.10
75 Con Virginia	4.30	100 Con Imperial	40c
300 Con Imperial	40c	200 Crown Point	1
75 Crown Point	.95c	40 Chollar	.51
30 Chollar	.51	130 Challenge	1.65
70 Challenge	1.60	120 Dardanelles	.85c
40 Caledonia	1	60 Exchequer	.2½@2.70
100 Endowment	.72½c	130 Endowment	.75
130 Julia	.75@70c	200 Enterprise	.1½@1¼
35 Justice	1.15	40 Gould & Curry	.4½@4.55
200 Kossuth	.10c	40 Hale & Nor	.5½@6¼
120 Leviathan	.30c	130 Julia	.65c
40 Lady Wash	.55c	170 Justice	1.05
40 Mexican	.18	20 Kentuck	2.80
600 Mint	.10c	150 L Wash	.50c
200 New York	.32½@31c	20 Mexican	.17½@17
30 Ophir	.21c@21½	100 New York	.32½c
20 Overman	4	100 North Carson	.1c
35 Potosi	3	20 Ophir	.20½@20
120 Phil Sheridan	.25c	30 Overman	3.95
40 Savage	4.60@4.65	400 Orient	.12½c
40 Sierra Nevada	.21½@24	75 Potosi	3
200 Senator	.76@8c	30 Sierra Nevada	.23½@23½
100 Silver Hill	.80c	100 Senator	.6c
60 Union	.42@42½	200 S Utah	.3c
20 Utah	.10½	70 Scorpion	.2½
100 Ward	.1½	200 Silver Hill	.85c
500 Wells Fargo	.1c	20 Union Con	.41½@41½
110 Woodville	.12½c	20 Utah	.10½
30 Yellow Jacket	.91½@5½	200 Ward	.1½@1.20
AFTERNOON SESSION.		50 Yellow Jacket	.90@85
25 Alpha	.8½		

Mining Share Market.

The stock market has taken a very decided tumble this week, and the shrinkage in "securities" has been somewhat disastrous. The break has been aided, if not caused, by the proposed shutting down of the Savage and consequent expected flooding of the Halo & Norcross, elsewhere alluded to. Our stock tables will give the details of decline in prices.

On the Comstock the situation, aside from that in connection with the Savage and Hale & Norcross, remains unchanged, and there is no new feature along the lode worthy of special comment, except along the Hardy vein in Ophir, and in the Union-Mexican winze from the 2,000 level, where improvements are noted. In some of the mines less than the usual amount of work is being done; but these mines are mostly those south of the middle.

We give in another column the elections of several mining companies.

Since writing the items in other columns, as we go to press a compromise between Hale & Norcross and Savage managers is announced to have been effected, the Savage to keep its pumps running and half the expense to be paid by the Hale & Norcross.

The North Con. Virginia Mining Company have petitioned to be allowed to disincorporate.

Meetings and Elections.

OPHIR M. CO.—Dec. 17th. Directors: C. L. Weller, Geo. Wallace, C. H. Fisk, R. H. Follis, J. N. Dohinson, A. K. P. Harmon and C. O'Connor. The reports of the President, Col. Weller, and Superintendent Patten give, to quote the President's language, "good reason to believe that the company may enjoy a long period of dividends." The report of C. L. McCoy, the Secretary, shows the following receipts and expenditures: Cash balance on hand December, 1878, $17,503.38; assessment, balance of No. 34, $2,700; hullion yield for the year, $1,283,246,07; hullion samples, $735.01; product of ore purchased, $22,055.65; received from other mines for labor, material, power, hoisting and pumping, $223,019.10; rebate on freight, $457.64; total receipts, $1,549,716.85. Paid for salaries and wages at the mine, $535,282.73; supplies and miscellaneous expenses, $404,246.84; reduction of ore, $172,575.45; purchase of ore, $22,055.65; discount on hullion, $111,720.79; freight on hullion, $5,245.99; taxes, $23,556.42; water rent, $13,200; office expenses, San Francisco, $8,446.18; Virginia, $882,66; assaying, $3,704.37; interest and exchange, $3,049.47; legal expenses, $6,262.45; insurance, $2,400; surveying, $1,200; assessment expenses, $195; dividend No. 23, $100,800; total expenditures, $1,414,824.02. Bullion on hand, $59,952.04; cash on hand, $72,151.30; cash with Superintendent, $2,789.49; total amount on hand, $134,892.83.

GOULD & CURRY.—Dec. 15th. Directors: W. S. Hobart, A. B. Hull, William S. Lyle, A. Hayward, William Kohl, S. Heydenfeldt and Robert Sherwood.

MT. DIABLO M. CO.—Dec. 15th. Directors. H. H. Allen (President), N. C. Paddock (Vice-President), J. W. Shaw, M. Hubbard, C. N. Shaw (Secretary).

IDAHO M. CO., of Grass Valley, Dec. 15th.—Trustees: Edward Coleman (President and Supt.), John Polglare (Vice-President), John C. Coleman (Secretary), Geo. W. Hill (Treasurer), M. P. O'Connor.

Bullion Shipments.

Since our last issue, we have noticed the following bullion shipments:

Ophir, Dec. 9th, $37,145.78; Northern Belle, Dec. 10th, $6,034.42; Con. Virginia, Dec. 11th, $45,834.87; California, Dec. 11th, $19,450.10; Alexander, Dec. 12th, $6,212.68; Gila, Dec. 13th, $1,162.18; Belle Isle, Dec. 15th, $4,000; Navajo, Dec. 15th, $6,700; Paradise Valley, Dec. 11th, $4,492.34.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

GOVER.—Amador *Dispatch*, Dec. 13: The Gover mill has started up again, and is now at work crushing.

ZEILE.—The boilers, drums, stacks and other heavy articles for the machinery of the Zeile mine have arrived in town.

BUTTE BASIN.—At this mine one of their large pumps got out of order down in the shaft last week, and being unable to get the water out in order to repair it, they solved the problem by sending below for a couple of professional divers, who went down in the mine last Sunday and succeeded in getting it in working order again.

ST. LOUIS.—Amador *Ledger*, Dec. 13: A parcel of 50 tons was crushed at the Amador Con. mill, at Sutter Creek, lately, which yielded $500. Ten dollars per ton leaves a handsome margin of profit. The Amador Con. mill, at Sutter, is expected to start on rock from the new shaft about the first of next month. The Clark mill, near Ione, commenced operations on custom rock on Wednesday. A full head of water is running in the Purinton ditch, and the gravel claims in the vicinity of Ione are preparing to start. The Amador Gravel company, whose claim is two miles from Jackson, have just cleaned up. We are informed that 31,000 was the product, a very good yield considering the washing done.

PLYMOUTH.—Our mining prospects in this section were never better. It is now thought by good, practical miners that the coming season will open up many of our mines which have been lying idle for years for want of capital to work them.

BUTTE.

BANNER MINE.—*Butte County Register*, Dec. 12: This old mine, after lying idle for 20 years, has again been put in working order, and the first clean-up for five days' work showed an amount equal to $3,500. The opening of these mines will contribute largely to the prosperity of Oroville.

CALAVERAS.

WEST POINT.—Cor. *Calaveras Chronicle*, Dec. 11: The Champion's new hoisting works are about completed, and will soon be in motion. Their mill is running steadily on good quartz. San Francisco parties and experts are at present examining the Lone Star and Reed & Hillary mines, and I believe so far are favorably impressed. The granite casing of the Tom Paine mine, crushed at Carlton's mill recently, paid $50 per ton, while the quartz paid $233 per ton. Henry's mill is at present engaged crushing rock for Tuck & Co., which will average $50 or $00 per ton.

MILL STARTED.—The mill at the Safe Deposit gravel mine, which was moved lately to facilitate operations, started up Tuesday of this week. The new tunnel is completed and any amount of fine-looking gravel is being taken out.

DITCH BROKE.—The Canal Company's ditch broke again Tuesday, causing a failure of the water supply for a couple of days.

CONTRA COSTA.

PROSPEROUS.—Antioch *Ledger*, Dec. 13: The work of extracting and shipping coal from the Empire mine continues, and the owners, Messrs. Judson, Belshaw and Rouse, have found it necessary to put in an additional engine for hoisting two loaded cars at once. The mine is looking more favorable as it is opened at a greater depth. They are now working on the mine and the 1200 level, and the incline has reached the depth of 1,500 ft. The company is shipping about 200 tons of coal daily.

EL DORADO.

A NEW MILL.—El Dorado *Democrat*, Dec. 13: Twenty carpenters, and a proportionate number of other hands, have been at work on the new mill and other buildings in course of erection by the Placerville Gold Quartz company. These buildings, when completed, will rank with the most substantial and convenient mining improvements in the State.

LAKE.

QUICKSILVER.—*Calistogian*, Dec. 13: The Great Western Quicksilver mining company, of Calistoga, have declared a dividend of 25 cents per share, payable at once. This indicates that the mine is well managed, thus proving a source of revenue to its stockholders, of whom, on account of the large number of shares held by each, there are very few. During the week ending with Tuesday, Dec. 9th, 36,490½ pounds of quicksilver were shipped from Calistoga to San Francisco.

LASSEN.

HAYDEN HILL DISCOVERIES.—*Review*, Dec. 13: There have been some recent discoveries at Hayden Hill. A short time ago Farling & Harvey struck a vein of decomposed quartz, which was fabulously rich. In a space 20 ft deep by 20 ft in width, they extracted over $8,000. They are now down about 50 ft, and the ledge proves to be a lasting one. In the Brush Hill mine, owned by Harbert & Hoes, they have a shaft 100 ft in depth. On the 00 level there is a drift of 380 ft, and on the 100 level another drift of 110 ft. Hopkins & Co have sunk to a depth of 150 ft, and have taken out considerable bullion. Three quartz mills are now in operation—the British Hill mill with 10 stamps, the Providence and Golden Eagle mills with five stamps each. The main lead averages about seven ft in width, and pays from the top down.

MARIPOSA.

THE HITE MILL.—Mariposa *Gazette*, Dec. 13: Hite's new addition of 20 stamps (making a total of 40 stamps) to his quartz mill is said to have started up on Thursday last. The South Hite company are sinking shafts and running levels, and are said to have an excellent prospect before them. They will build a mill in the spring.

MONO.

OPERATIONS IN BODIE.—*News*, Dec. 14: The weather during the earlier part of the week retarded surface operations to a considerable extent. Operations in the district are steadily expanding. Among the notable improvements projected may be mentioned the King Bee. On Monday sinking of a new double-compartment working shaft will be commenced, and the erection of steam hoisting works will speedily follow. The new shaft house over the South Noonday is rapidly nearing completion. At the Jupiter the pumps and new machinery are being put into position as fast as possible. The new pump for the South Bodie will soon be along. If about one week the Noonday mill will be ready to begin crushing ore; and the pumps are nearly ready to start in the mine. The Standard mill cannot be started before January 1st, and it will be nearly a month later before the Bulwer-Standard will be completed. In the way of mine developments, the Belvidere people have cut a fine ledge of enormously rich ore in the shaft. In the Con. Pacific, the showing made during the past week has been flattering. The existence of a bonanza has been actually demonstrated in the Bechtel; but a mill must be built and a new shaft sunk before the stockholders can realize the dividends. The Boston Con. has been proving itself a valuable property of late, while the Queen Bee, near by, looks very encouraging. Several mines, such as the Bulwer, Goodshaw and Mono, have got their pumps to working. Notwithstanding the stoppage of the Standard mill, there is not likely to be any falling off in our monthly bullion product.

KING BEE.—In the King Bee a new double-compartment shaft is to be sunk to test richness and extent of ore veins. The mine has lately been purchased by New York parties.

RUSTLER.—Work has been resumed on the old Rustler by reopening the old shaft.

JUPITER.—Pumping machinery nearly all on ground. At the 500 level they are now timbering portions of the main south drift. The east crosscut from this drift cut the east wall six ft. A crosscut was then started west, and is now in 43 ft with favorable indications. It is proposed to run this crosscut the entire width of the company's ground, and from the favorable indications important developments may be made at any moment.

BELVIDERE.—This valuable property again gives promise of soon being a bullion-producing mine. The late strike of a three and one-half foot ledge at 352 ft in the shaft, or 52 ft below the 300 level, is most encouraging. Assays taken from the bottom of the shaft at different points, to get a fair average, went $34.50 to $66.60.

ADDENDA.—The drift on the 460 level looking well and producing the usual amount of good ore. Work suspended for the present on the 300 level.

DEFIANCE.—The company has concluded to open a station and drift from the 475 level, this arrangement allowing them a 25-ft sump, and will be 225 ft below the upper level, a very fair distance for cutting and testing the ledges cut at the 250 level.

MARYLAND CON.—Bodie *Chronicle*, Dec. 13: The new ledge struck on the 4th inst. yet continues to increase in richness, assays recently made showing from $145 to $108 per ton.

MONO.—Connection has been made on the 400 level with the Bodie, thus insuring perfect ventilation. The work is being confined to sinking.

TIOGA.—Main shaft 700 ft. Vein in bottom of shaft is improving as depth is attained.

NEVADA.

PLANET GRAVEL MINE.—Grass Valley *Union*, Dec. 14. The incline from the end of the tunnel, in the Planet gravel mine, has been sunk nearly 150 ft, all the way through gravel which prospects well in gold. The bedrock still continues to pitch, and the bottom of the channel has not been reached or its width ascertained. The engine does the hoisting and handles the water in the mine easily, with plenty of power to spare. The gravel taken out is all saved for washing, but no regular washing will commence until the ground is sufficiently opened to admit of the steady extraction of gravel. The character of the gravel improves as the incline descends more toward the bottom of the channel.

DEWEY GRAVEL MINE.—This mine, on the Steep Hollow side of the Bear River ridge, and nearly opposite the Planet ground, is being rapidly opened up, and preparations making for washing gravel by the construction of gravel dumps, and the necessary buildings, so as to admit of regular operations through the winter months.

PENNSYLVANIA QUARTZ LODE.—This quartz lode, located just beyond Ophir hill, on the head of Mary's ravine, is now being prospected by a shaft sunk near the old reservoir. The shaft is down 30 ft, at which depth the ledge shows a width of four ft.

BULLDOZER.—Nevada City *Herald*, Dec. 11: J. J. Rogers, Esq., reports work as progressing satisfactorily at the Bulldozer mine. The owners are taking out another crushing of rock. The last crushing paid about $14 per ton.

NORTH BLOOMFIELD.—Cor. North San Juan *Times*, Dec. 13: The Bloomfield company are washing steadily, and are receiving handsome returns. This section of country is one of the richest and best in the State, and has a bright future. The inhabitants look cheerful and have "fixed up" to stay. The Derbee company are employing about 100 men, and pay cash every month. The mine is on a paying basis, and a tunnel is about to be run to drain the channel, which has proved to be rich and extensive.

ERODON MINE.—Nevada *Transcript*, Dec. 17: Washing was stopped Monday at Sargent & Jacobs' hydraulic claim, Quaker Hill, owing to a failure of the water supply. The first storm that comes will start the monitors again. Mr. Jacobs says that scores of men apply to him every week for work, but that already he has every position filled and all probable vacancies for some time to come are spoken for.

ADALANTE.—The Adalante company have determined to sink an incline on the north side of the hill, in hopes of opening up the channel supposed to underlie the claim. The shaft heretofore sunk to the depth of 116 ft at the center of the hill will be abandoned for the present.

QUARTZ MINING ITEMS.—The Murchie is steadily producing good ore, and extensive improvements are being made in the way of smelting works, etc. The Providence drain tunnel is in a distance of between 1,500 and 1,000 ft. The Merrifield has an eight-ft ledge of heavy sulphureted ore. Hoisting and milling rock going on steadily. The Wyoming has a good ore body. The new and long drain tunnel is proving a great advantage in working the mine. The tunnel on the Champion, through which the company can work several ledges, is approaching completion. A clean-up of 14 tons from the Davenport, last week, gave a yield of 105 ounces of amalgam, worth about $850. The old Banner mine is to be revived, with the aid of Eastern capital. The hoisting works on the Mt. Auburn claim are nearly completed. The Bulldozer shaft is down 30 ft. Crushings of the rock have yielded $10 per ton. The Crosby and Olive mine on Gold Flat is turning out some very rich ore, there now being about 00 tons at the mill. The new hoisting works of the El Capitan have started, and the shaft down 00 ft, with a 22-inch ledge at the bottom. The new ten-stamp mill of the Nevada City mine is running nearly to its full capacity the greater part of time. Work in the gravel mines in the district is being industriously prosecuted.

PLACER.

MOUNTAIN GATE.—Placer *Argus*, Dec. 13: The Mountain Gate mine, at Damascus, is getting rich pay dirt at present. Thirty carloads recently taken out averaged $3 80 per carload. Twenty-three men are employed in the mine. The contract for running an upper air drift 250 ft long was to have been let last Sunday.

DIVINE ITEMS.—Placer *Herald*, Dec. 13: The mining season has begun early this year upon the Forest Hill divide, most of the ditches already having considerable water in them. Pond & Constable, at Todd's Valley, are running with about 500 inches, and the prospects are that this will be much increased by the late storm. They will put off a blast of 18,000 pounds of Judson powder during the coming week. The Dardanelles mine is running one pipe with a capacity of 1,400 inches, night and day, and will start up another in a few days. Two more blasts will be fired during the coming week. About 9,000 pounds of Judson powder will be used in each. An upraise from the end of the Vigilance tunnel in this mine has been run into a channel of rich pay gravel.

PLUMAS.

ON THE DIVIDE.—There is a good prospect of quite lively times the coming spring at the mines on the divide between the Meadows and Indian Valley. These mines are immediately on the line between Plumas and Lassen counties. Water is obtained only by the melting of the snow in the spring.

SAN DIEGO.

JULIAN AND BANNER DISTRICTS.—San Diego *News*, Dec 13: The Hubbard mine is now down 365 ft. On the dump are 200 tons of ore expected to yield $20 per ton. There is talk of work being resumed on the old Washington, which was the discovery claim of the district. The Stonewall Jackson mine, which is some eight miles from Julian City, and which was worked for some years and then shut down, is to be worked again. A new shaft is to be sunk. Messrs. Farley, Clark & Co. hope to develop a good paying mine this time.

SIERRA.

MINING ITEMS.—Cor. *Mountain Messenger*, Dec. 13: W. M. Morso, of the hydraulic ground, Mugginsville, has done well this year, with a good prospect of better trumps next season. William Frank has bought the old claims of Conrad & Pearson, Marysville, and will do his full share in the good work as soon as water comes, as his iron pipes are all laid and in good condition. David Riebards is already fixed in Saw-mill ravine to commence hydraulicing as quick as water comes. He made an excellent clean-up on old abandoned ground this year. F. Blake has been washing some bedrock. Last year he realized good pay from the old ground purchased of Parks and Thatcher. The Celestiale, who bought Harry Baker's drifting and hydraulic claim, are washing up their drift dirt now, and on advent of water season will begin hydraulicing.

SISKIYOU.

DRIVEN OUT.—Yreka *Union*, Dec. 13: During the sudden raise of water in the Klamath river last Thursday week, the water broke through the dam of the Pacific mine and filled up the claim, which of course stops all work for this winter. The wheels were carried away but the shafting, pumps and derrick were saved. Some of the tools were buried in the claim, but most of the property was saved, and the tools buried in the claim will be got out when it is opened next spring.

TULARE.

SUB ROSA.—Visalia *Delta*, Dec. 12: C. F. Converse has made arrangements with the owners of the Sub-Rosa quartz lead, in Yokohl valley, to sink their incline 100 ft from its present depth, which is now 120 ft. This lead is four ft wide and shows free gold, and should it hold its present size and richness to the depth proposed, it would open up a body of ore that would justify a mill being put up.

TUOLUMNE.

SALE.—Tuolumne *Independent*, Dec. 13: R. C. Davis and A. Ericson, locators of the Continental, have effected a sale of this mine to parties below for $10,000. The company have already taken possession and are to commence the erection of buildings preparatory to further developing the mine, under the superintendency of James T. McLean. Never, in the history of quartz mining in the county, has this interest shown so prosperous an outlook as at the present time. It may truly be said to be the dawn of a new era in the quartz mining interest in Tuolumne.

NEVADA.

WASHOE DISTRICT.

OPHIR.—Gold Hill *News*, Dec. 17: The pumps are running from the 2000 level to the Sutro tunnel level and they are being extended down to the 2300 level and will then be continued to the 2500 level. The main incline continues in very fine-looking vein material containing considerable quartz giving low assays and dipping east.

MEXICAN.—The joint Union winze from the 2900 level is down 235 ft in a fine vein formation carrying clay and quartz of low grade which promises well.

CON. VIRGINIA.—On the 1750 level a drift has been started west from the main southwest drift to explore the ground lying west of the old No. 1 winze, and is making good progress.

UNION CON.—The stopes on the 2400 level continue their usual yield and the work of extending the sill floors along the drift east 10 degrees south is progressing favorably. The yield of this level is only limited to the hoisting capacity of the Union shaft while other work is going on through it.

CALIFORNIA.—On the 1750 level ore is stoped from the south drift from the bottom of the winze from the level above. The crosscut east from the main drift north on this level continues in a favorable vein formation.

UNION SHAFT.—The work of putting in the main chord of the surface bob is well under way, and the engine will be placed as rapidly as possible. The machinery is arriving rapidly and will all be on the ground as fast as it is needed.

FORMAN SHAFT.—The bed plates of the pumping engine are being placed. The cooling pond is completed and the work of putting in the pumps has been commenced.

SIERRA NEVADA.—The east drift on the 2300 level is now in 108 ft, the face in a soft vein formation of clay, porphyry and quartz, the latter giving low assays. Work has been resumed in the north lateral drift on this level, and it will be pushed on for a main thoroughfare on this level.

HALE & NORCROSS.—During most of the past week all energies have been directed to preparing the mine for the anticipated flooding from the Savage. The loose ground has all been caught up, and now the work of sinking the winze on the south line will be pushed vigorously.

SOUTH SILVER.—The crosscut east from near the north end of the tunnel has some 30 or 40 feet farther to go, in order to intersect the excellent ore vein known to exist in that direction, and which was cut into by the other east crosscut farther south.

BELCHER.—After placing the pumps at the 2360 and the 2500, work was resumed in the mine.

SAVAGE.—No work doing in this mine except repairing and putting in order the connection with the Hale & Norcross on the tenth level at the head of the incline. This is needed for ventilation and for a passage-way between the two mines. Orders have been received to continue pumping till further instructions are given.

GOULD AND CURRY.—The new joint shaft is encountering plenty of water, which requires the full force of the pump to keep down.

NORTH BONANZA AND FLOWERY.—The station at the 000 level has been completed, chutes constructed, and a drift started to open up the ledge on this level.

BEST AND BELCHER.—Connection has been made between the drift north from the bottom of the joint Con. Virginia winze and the drift south on the 2150 level of the Con. Virginia mine.

JULIA CONSOLIDATED.—Preparations for the resumption of work on the 2000 level are going on, that level having been freed from the accumulation of water.

SILVER HILL.—A diamond drill has been sent in ahead of the crosscut on the 1300 level 114 feet, and encountered porphyry, clay and quartz, the latter giving low assays.

IOWA.—During the past week the drift running towards the ledge has showed more frequent and conclusive evidences of nearing the vein.

WARD.—The shaft has attained a depth of 1380 feet, and is penetrating a very promising formation.

UTAH.—The balance bob in the main shaft has been connected, as also has the third pump in the incline.

LEVIATHAN.—The works are shut down and work in the mine suspended for a few days for repairs, and to lay a new foundation under the hoisting works.

BRISTOL DISTRICT.

ITEMS.—Pioche *Record*, Dec. 13: Work is still in progress upon the cupel furnace, and the smelter and machinery are undergoing a thorough overhauling. The Hillside stands third upon the list of base metal bullion-producing mines in the State of Nevada. Real estate has advanced 100% during the past six months. A good deal of prospecting is being done at Blind mountain. The Hillside produced $72,430 on November account.

ESMERALDA DISTRICT.

REAL DEL MONTE.—Esmeralda *Herald*, Dec. 13: All work at the mine for the past week has been centered in the excavation for the plunger pump, below the 500 level. This excavation is to be 12x14 ft and 25 long. In addition to this it has been found necessary to enlarge the pump compartment of the shaft two ft for a distance of 25 ft above the 500 level. With no accident to prevent, this work will be completed inside of 10 days, when the plunger will be immediately placed in position. The carpenters are at work fitting the pump rods together and getting everything in readiness to put them in place.

EUREKA DISTRICT.

THE K. K.—Eureka *Sentinel*, Dec. 14: We are reliably informed that within the past few days a body of ore has been developed in the lower levels of the K K. of such size and value as to justify the most brilliant anticipations for the future of that mine. This is the second important strike reported in 24 hours.

THE STRIKE IN EUREKA TUNNEL.—Assays have been made of the strike in the Eureka Tunnel, with the following results: No. 1, $20.41; No. 2, $17.27; No. 3, $257.33. The tunnel is now in 960 ft, and the present strike proves conclusively that ore exists at great depth in Prospect mountain. The discovery of ore in the tunnel will give renewed energy to the men who have been prosecuting the work, and a contract to run the tunnel an additional 100 ft was let to Mr. Hugh Hamilton yesterday.

EUREKA CON. SHIPMENTS.—During the past week bullion to the amount of 221,000 pounds has been shipped by the Eureka Con., an average daily shipment of 33,000 pounds, with but two furnaces running, the third having been run down for repairs.

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Notes on Some Undescribed Fishes of the Pacific Coast.

[A portion of a paper read before the California Academy of Sciences, October 6th, 1879, by W. N. Lockington.]

A few notes upon four probably undescribed kinds of fishes, examples of which have occurred in our markets—fishes, all of them useless as articles of food, either on account of their rarity or of their small size, but interesting from their structure—may prove not uninteresting.

Icosteus enigmaticus.—The first of these has been in our museum some four years, and has been and still is a puzzler. That is to say, it has peculiarities that make it difficult to place it in any of the recognized families of fishes. It has no scales, but there is a row of bunches of prickles along the lateral line, and the fin-rays have smaller prickles set along their sides. The body is exceedingly compressed and thin, the snout blunt, the pectoral fins have a fleshy base, and the caudal rays are arranged fan-fashion, round a fleshy semi-ellipse. The mouth is large, and the only teeth are on the jaws. It must be remembered that many fishes have teeth in the interior of the mouth, on the vomer and palatc hones, on the tongue and on the gill-arches in the throat.

Another very obvious peculiarity is the want of consistency in its bony framework. The vertebræ are soft, the jaws and other facial hones are flexible and easily distorted. The only hones possessing the least firmness are those surrounding the brain.

Two specimens of this fish, with a third which differs in some particulars, and is now too distorted to do anything with, were procured in the market by Mr. Harford, and I lately saw a small specimen in the museum of the State University, Berkeley. The last example came from Washington Territory. Prof. Cope saw examples of the fish in Oregon. Most fishes whose habits are pelagic, that is, ocean fishes living in deep water, have softer bones than shore fishes, and it is probable that this fish lives in the depths, and only very occasionally straggles within reach of fishing-nets. Those in our possession came from the deepest water reached by fishermen, and were called "deep-sea fish" by them.

Myriolepis zonifer.—Another rarity, of which I have as yet only seen one specimen, looks at first sight very much like a very young *Jew-fish*, (*Stereolepis gigas*). Like that fish, it has two distinct dorsal fins, and there is considerable resemblance in form, as well as in the scales and teeth.

But a closer examination shows many differences. The teeth, though small and numerous, forming a band of many rows in both jaws, are positively larger than those of a Jew-fish of eight times its bulk, and the free edge of the preopercular bone, which is denticulated or toothed in the Jew-fish, and in most related fishes, is without teeth or spines. The number of rays in the fins is not the same as in the Jew-fish, and the shape of the fins is different.

But the most curious thing about the fish is the great development of its scaly covering. Most fishes have the fins, or certain parts of the head, without scales; but this fish is almost completely covered with rough scales. The jaws, upper and lower, the opercular bones to their edges, even the exposed surfaces of the gill-rays, are scaly. The outer surfaces of the pectorals and ventrals, and both sides of the anal, second dorsal and caudal, are scaly, and even the rays of the first dorsal are not free from scales.

Artedius quadriseriatus.—Among the fishes known as sculpins, is a group of small marine forms, which have teeth upon the inside of the mouth as well as on the jaws, the gill-membranes are united to each other beneath the throat, a band of scales along the body, and a flap of skin over each eye.

A small species belonging to this group occurs with tolerable frequency among the heaps of prawns (*Pandalus danæ*) in our markets. As it never much exceeds three and a half inches in length, it is of course of no value as food. The principal specific character of this little fish is that its otherwise scaleless body is traversed by four separate single rows of ctenoid scales, one along the middle of each side, the other pair nearer the dorsal outline. The lower row is pierced by the pores of the lateral line. The preoperculum is armed with a particularly ugly weapon in the shape of a long spine which branches on its upper margin, antler-like, into four or five other spines. It is these preopercular spines, with others upon the top of the head, which cause the sculpin tribe generally to be abhorred of the fishermen.

Odontopyxis trispinosus.—Not very distantly related to the sculpins is a tribe of fishes that are covered with bony plates above and below. Some of these have the pectoral fins so much developed that they can spring from the water and traverse the air for some distance—that is, are flying-fishes—but those found on this coast have not this power.

A specimen of a fish belonging to this tribe, differing from any of which I could find the description, has been in our museum for about four years. It came from Alaska. During the present year I have found several other specimens of the same species in our markets, among the heaps of prawns which furnished the last species.

It is a very small fish, about three inches long, and totally useless for food. On the end of its snout it bears a movable spine, behind these a pair of fixed spines, another pair on the back of the head, and still another on the sides of the snout. There are teeth on the vomer and palate bones as well as in the jaws, and there are no barbels or fleshy processes under the chin. These two last characters separate it generically from its nearest relatives.

About 36 series of rings of plates cover the body between the occiput and the caudal fin, but the first of these covers the upper surfaces only. The front part of the body is eight-sided, the upper and lower sides largest. Behind the second dorsal the upper and lower surfaces come to a point, leaving a six-sided section. The head is much broader than deep, and its under side, in front of the ventrals, is plated with about 27 plates. The two dorsals are very small; the first with four rays, the second with six. At every angle of the body is a row of keels, one on each body-plate, all ending in a spine posteriorly.

I have forwarded full descriptions of these fishes to Prof. D. S. Jordan, for publication by some scientific academy, which, more flourishing than our own, can afford to publish scientific work.

Some months ago I wrote for publication a description of a small sculpin which I named *Chitonotus megacephalus*, the large-headed mailed-back. Since that time we have received the Proceedings of the Imperial Academy of Vienna, and I find that Dr. Steindachner has got ahead of me, and has described the same fish from specimens obtained in Puget sound.

He also gives a figure. From this figure I judge that the form and proportions of the dorsal fin vary considerably. In my specimens the first spine is exceedingly long, the third quite short, shorter than the fourth, and as these two spines are twice as distant from each other as are any of the others, and the membrane between them dips down almost to its base, the fin is practically divided in two.

Dr. Steindachner's figure shows only a slight emargination of the fin, the first spine only slightly longer than the others, and the spines equidistant. Dr. Steindachner places it in the genus *Artedius*, of which we have a well-known species in our bay.

Artificial Ice in San Francisco.—Some months ago the inventors of a new process for the production of artificial ice commenced the erection of a building and machinery on Fremont street, near Folsom. The new process has been tested, and it worked to the perfect satisfaction of the projectors. The principle is as follows: In the building are two large tanks fourteen feet long, four feet wide and four feet in depth, each capable of holding a thousand gallons of water. Each tank is divided into sections of five zinc freezing chambers. Some yards away stands the condenser, a large vessel filled with pipes, through which passes a liquid ether. This liquid is condensed and forced by an air pump into the freezing cells, in which a partial vacuum is created. The ether instantaneously absorbs all the heat in the water and passes again in a liquid form into the condenser, where it undergoes the same process, and is returned to the freezing cells as vapor. In about thirty-six hours the water in the tank has turned into blocks of ice which adhere to the edge of the cells, and from which they are detached by forcing hot air into those chambers. Each tank thus turns out from two to three tons of ice. It is curious in the warm atmosphere of the engine room to observe the ice gather on the pipes which conduct the ether to the freezing chambers. The inventors claim that the pressure is much less than in any other process of ice manufacture, and therefore ice can be produced in a warmer climate. An engine of fifteen-horse power with a perpendicular boiler works the pumps.

The Hottest Spot on Earth.—One of the hottest regions on the earth is along the Persian Gulf, where little or no rain falls. At Bahrin the arid shore has no fresh water, yet a comparatively numerous population contrive to live there, thanks to the copious springs which break forth from the bottom of the sea. The fresh water is got by diving. The diver sitting in his boat, winds a great goatskin bag around his left arm, the hand grasping its mouth; then takes in his right hand a heavy stone to which is attached a strong line and thus equipped he plunges in and soon reaches the bottom. Instantly opening the bag over the strong jet of fresh water, he springs up the ascending current, at the same time closing the bag, and is helped aboard. The stone is then hauled up, and the diver, after taking breath, plunges again. The source of the copious submarine springs is thought to be in the green hills of Osman, some five or six hundred miles distant.

A Novel Tramway.—A tramway has been opened in the German city of Brunswick on a new principle. The rail has no groove. It is laid exactly flush with the road's level, and may thus be crossed at any angle with any description of conveyance without any jar or disturbance. The car is guided and kept in its place on this rail by slight steel studs on the tire of the wheels, which fit into corresponding holes punched in the rail at the distance of every five inches. The invention is that of an English architect.

England Invaded by the Sea.

The sea is England's defence, the watery wall that protects her from hostile invasion; but it is at the same time an enemy and an invader. It has attacked and destroyed large portions of her territory, especially along the eastern coast. In this way certain localities of historical interest have passed away, like the men who made them famous. For instance, the seaport of Ravenspurg (also known as Ravensburg, Ravenspurn, etc.), at the mouth of the Humber, where Bolinghroke landed in 1399, had been partially ruined by the inroads of the sea before that event, and afterwards disappeared completely. As early as 1346 the merchants residing there removed to Hull, on account of the encroachments of the waters, and the high tides of 1357 and subsequent years swept away nearly all that remained of the town. Few vestiges of the ancient port could have been left at the time of Bolinghroke's landing, and even these must have been lost before Edward IV. landed there, in 1471, after his brief exile in Holland. The sea has continued its work of devastation down to the present time. A fine old cross, which is said to have been erected at Ravenspurg in memory of the arrival of Bolinghroke, has been several times removed farther inland, to save it from being engulfed. It was first transferred to Kilnsea, and again, in 1818, to Burton Constable, whence it was, in 1832, taken to Hedon, some miles farther up the Humber. There it is likely to find a permanent resting-place, as at that point the sea has been making land instead of destroying it. In the time of Edward I. Hedon was a greater port than its neighbor Hull, but the deposits made by the tide gradually filled up the harbor, and now luxuriant meadows are seen where stately ships, laden with the products of many lands, used to ride safely at anchor.

Along this part of the coast of Yorkshire many ancient towns and villages have been submerged. On old maps we may read, "Here stood Auburn, which was washed away by the sea," "Harthurn, washed away by the sea," "Hyde, lost in the sea;" and so with other places, to say nothing of many mentioned in old documents as being on this coast, but of which the very locality has been forgotten.—*Exchange.*

Two New Elements.—*Silliman's Journal* for November contains an account of the discovery of two new elements by Cleve, which he has named respectively as thulium and holmium. He was led to investigate the earth erbia in which Marignac had discovered ytterbium, and Wilson scandium, in order to distinguish the substance in this earth which gives the red color and the beautiful absorption spectrum to its salts. As the salts of ytterbium and scandium are colorless, the question was of interest to ascertain whether the substance possessing these peculiarities was erbium itself or some new elementary substance. After a large number of experiments, he announces, chiefly on the strength of spectrum observations, the existence of two new elements, as above noted. The name thulium is from Thule, the ancient name of Scandinavia; and that of holmium from the Latin name of Stockholm. Since the announcement of Cleve's discovery, two other observers, Soret and Boisbaudran, confirm the accuracy of his spectrum observations.

A New Field for Water Gas.—The increase of rabbits in New Zealand has been so great that it has been seriously proposed to introduce the weasel and the polecat to keep down their excessive numbers. An "exterminator," however, has been invented which seems to be effective. It consists of a machine for generating and forcing into the burrows carbonic oxide gas. On reaching the burrows a flexible tube, about five feet in length, is inserted into the hole, and the gas is forced into the aperture. The entrance to the burrow is then stopped, as well as all holes and fissures that can be found. In a few seconds a great hubbub is heard inside, but this quickly subsides. The burrow is dug open after a short time, when the dead bodies of the rabbits are found huddled together in every corner. The exterminator has been pronounced a perfect success.

New Motor.—The New York *Commercial Bulletin* says: Engineers, marine underwriters and others, to whom a knowledge of the fact has come, are deeply exercised by recent successes in the application of a giant motor obtained from the bisulphide of carbon mixed with petroleum. The patent, taken out by a Pittsburg firm last April, promises to revolutionize machinery motors. The method consists in the transmission of the above chemical agents from the chamber of the condenser to the boiler of the ordinary non-condensing steam engine. The boiler being filled with water heated to about 200 degrees, a pressure as high as 200 pounds to the square inch is rapidly developed from the vapor thus generated, and easily controlled.

Tightening Old Windows.—Old windows that do not close tightly may be remedied by smearing the edge on which they close with putty, and that of the sash with chalk, and then closing them as firmly as possible. The putty will fill up the crevices, and the excess pressed out at the sides may be removed with a knife, whilst the chalk prevents adhesion to the sash.

Detestible Frauds.

[By † †—No. 1.]

Verily there is no end to the frauds which are continually being perpetrated upon the unsuspecting public. They constantly loom up and present themselves in as varied disguises as are ever seen at masquerade balls, and are equally varied in character.

The class which we now have to deal with, is the advertising class, who use the newspapers to obtain money by promises of returning from 10 to 50 times the amount sent, in articles of various kinds. We have before us as we write, several samples of these advertisements which have been sent us for insertion in our papers, and to receive in payment for such insertion, in one case a Bible, and in another a revolver. We are not in want of either Bibles or revolvers, and as we know the whole thing to be a fraud we decline to insert the advertisement, preferring to use our columns only for legitimate purposes.

The Bible man in his advertisement describes a "Royal quarto Bible," containing:

The Old and New Testaments, Apocrypha, Concordance and Psalms, nearly 2,000 illustrations, 36 full-page engravings; and 115 additional features, the most important of which are a Bible dictionary, history of the books of the Bible, history of religious denominations, history of the nations, cities, rivers, lakes, birds, beasts, reptiles, insects, trees, fruits and flowers of the Bible, 100,000 marginal references, marriage certificate, family record and a photograph album. Printed with clear, large type, on paper of first-class quality. The work is superbly bound in morocco, massive raised panel, gilt edge and back, and was sold two years ago at $15 per copy.

And he further says that for $1 he will send, postage paid, a copy of the Holy Bible, but he does not say that he will send a copy of the above described $15 Bible, not he. He may possibly send *a Bible*, but it will probably be such a one as can be bought at any hookstore for about 75 cents or $1. It is extremely doubtful, however, if the sender ever hears from his dollar again.

The revolver man, who by the way is evidently the same person though a different name is given, offers a six-shot revolver free to any one who will send 75 cents for a six months' subscription to an unknown paper. He says:

The famous *American Model*, six-shot bulldozer revolver is made of select metal and neatly finished. The cylinder revolves when the hammer is raised. Can be loaded in an instant. Just the thing for tramps and burglars.

We do not exactly understand this. Is it possible that he is desirous of obtaining the patronage of tramps and burglars? I would seem so from his advertisement.

It may be that knowing that his revolvers are worthless, he thinks that he will be conferring a favor on the public by supplying tramps and burglars with them.

Several months since a friend of ours received a printed postal card from the East, offering to send a genuine Swiss magnetic time-keeper, warranted to keep perfect time, for the small sum of 60 cents. This was his chance to get a watch he said, and he forwarded the amount to the sender of the card. For about three weeks visions of fine time-keepers haunted his waking and sleeping hours. They haunt him no more. He never more heard of his 60 cents or the watch he was to get.

Another style of advertisement we have received reads that "$10 to $500 invested in Wall street stock makes fortunes every month." "Two unerring rules for success sent free." Address, Bimpson & Co., Bankers and Brokers, New York."

This is evidently another of the so-called bucket-shop swindles, which were at one time so numerous in this city. No bankers or brokers of any pretense to respectability would so far debase themselves as to lend their names to any such nefarious transactions. The chances are that Bimpson & Co., are myths after the style of the late firm of Martin Taylor & Co. of this city, who it will be remembered suddenly disappeared, when it was discovered that the firm name was an assumed one, used to give an air of respectability to the swindle. They also made a medium of many a newspaper (not including ours) to perpetrate their frauds.

Motive Power Engine.—An improved motive power engine, working by means of atmospheric pressure under the effect of barometric vacuum, has been invented by Messrs. Plaisance, Mocquard and Emery, of Paris. By means of two connecting rods a shaft receives a rotary motion produced by the action of two pistons moving in two parallel cylinders. Each cylinder is closed at one end, and communicates with an oscillating cylinder in the form of a U, which may be placed either horizontally or vertically. When it is placed horizontally and filled with mercury, as well as the motive cylinder, the piston should be at the end of the fixed cylinder; the oscillating cylinder is then placed in the vertical position, and mercury falls, and the barometric vacuum being produced, the piston pushed by the atmospheric pressure will reenter the fixed cylinder. The oscillating cylinder then again takes the horizontal position, and the mercury re-entering the fixed cylinder, the piston moves in the contrary direction. The second fixed cylinder is so placed that its piston and that of the second oscillating cylinder are the reverse of the first cylinder. Counterweights equilibrate the weight of the U-shaped cylinder full of mercury.—*London Mining Journal.*

The Engineer.

Tramway Construction.

A paper was recently read before the Manchester Scientific and Mechanical Society, by W. T. Gunson, C. E., in which the writer described a new system of tramways, which consisted in laying down a continuous length of stone sleepers similar to the kerbs now in use for footpaths. In these kerbs were cut longitudinal grooves one and three-fourth inches deep, three and one-eighth inches wide at the top, and three and three-eighth inches wide at the bottom, thus forming a dove-tailed groove. The bottom of groove was covered by a one-fourth inch layer of Limmer, Seyssell, or other natural rock asphalte, by which means a perfectly even, solid and elastic bed was obtained, upon which to rest the rails and the joints between the sides of the rails, and the sides of the grooves were filled up by a fusible mineral cement. As the rails were rolled on the sides with a splayed foot and groove, they were thus so firmly fastened and embedded in the sleeper as to render any other fastening unnecessary, but if required, they could, in addition, be secured in the ordinary manner by a strong coach screw into a wooden plug, by a bolt and nut, or a gib and cotter. At the junction of the rails, a quarter-inch iron plate, eight inches long, was inserted under the joint, and lead was run in for a similar length, thus making the rails perfectly immovable.

Mr. Gunson claimed for this system that it avoided all the well-known disadvantages of those at present in use—that vehicles of all descriptions could use it, and that whilst the cost of laying down was much the same as other systems, the cost of maintenance was considerably less.

In the course of the discussion, the Chairman observed that although much had been done in effecting improvements in tramways, a great deal yet remained to be done, and they would not arrive at perfection until they got tramways or roadways upon which every description of vehicle could travel. He had no doubt they would get it some day, and he hoped they would never rest satisfied until they did. The members generally condemned the systems of tramways at present in use.

The Hudson River Tunnel.

Since the resumption of work upon this undertaking, by reason of the recent removal of legal obstacles, considerable progress appears to have been made. On the Jersey City side, the shaft at the foot of Fifteenth street has been sunk to its entire depth, 65 feet, and the horizontal drifting of the tunnel proper will shortly be commenced. It is contemplated by the Tunnel Company to work from both sides of the river so soon as the shaft on the Jersey side has been made perfectly clear. The shaft on the New York side will be located at the foot of Morton street. When fairly underway, it is announced that the Tunnel Company intends to prosecute the work day and night without intermission, with the expectation of completing the work within two years.

The published accounts of the exact position of the tunnel when completed afford us the following information: The entrance to the tunnel on the Jersey side of the river will be from the corner of Jersey avenue and Fifteenth street; to extend thence to the Hudson river, about 3,400 feet; thence under the river, curving five degrees northward to the New York bulkhead line, at or near the foot of Morton street, about 5,400 feet, thence curving slightly southward about 3,000 feet to a point to be selected by the New York Board of Aldermen. The entire length of the tunnel, with approaches, will be about 12,000 feet, or about one mile under the river and three quarters of a mile on each shore. The tunnel walls will be constructed of brick and cement, three feet in thickness, and will be of nearly circular section, 26 feet in width and 24 feet in hight. The interior will be painted white, lighted with gas, and will be provided with a double-track railway of steel rails laid upon a foundation of stone ballast five feet from the bottom. It is believed that the tunnel will be able to afford transit to 400 trains daily.

The New Ocean Telegraph.—The Franco-American cable, just laid, is owned by French and American stockholders, whose paid-up capital is $8,000,000, which is soon to be increased by $2,000,000 more. The cable runs from Brest, France, to St. Pierre, off the coast of Newfoundland, and thence to North Eastham, near Provincetown, on Cape Cod, Massachusetts. The ship *Faraday*, which laid it, will go back and stretch another cable from Brest to Land's End, England, a distance of 200 miles, and next year another from Land's End to St. Pierre, thus giving double communication with this country. The cable is composed of a copper wire wrapped around by 10 others of the same material. These are all hidden away in three envelopes of gutta-percha, and outside of these again is a wrapping of manilla hemp treated with a protecting compound. Over this is a covering of steel wire, which is itself coated with a layer of anti-corrosive compound. It is said to be the strongest and best cable ever laid.

Useful Information.

Silicate Cotton.

One of the most important outcomes of blast-furnace slag is slag wool, or silicate cotton as it is also called, from its resemblance to cotton wool. Silicate cotton is now generally recognized as among the most efficacious of all boiler and steam pipe coverings, but the main difficulty has been to apply it in such a form that the cotton should remain in a compact state without chance of shifting or escaping during repairs. After a series of experiments Messrs. Daniel H. Dade & Co., of London, have managed to overcome the difficulty stated, by applying the cotton, made into mattresses two and three inches thick, to boilers, rendering the shifting of the cotton impossible. For steam-pipes the silicate cotton cement is equally useful, but another and most successful method is to apply the cotton woven with flexible iron wire into long bands which can be twisted spirally round the pipe, an operation which requires little time and no great skilled assistance. When fixed in its place a covering of canvas protects it from injury. Mr. John Alexander, of Glasgow, writes: "I can show anyone anxious to see it, silicate cotton woven with wire on to canvas, and which is much superior for covering to the mattress plan. At the present moment experiments are being carried on to still further utilize the slag from blast-furnaces."

This article is gradually coming into use for a great variety of purposes under the name of "mineral cotton," and it is suggested that caution be exercised in its use, particularly for filling between floors, on account of the sulphureted hydrogen developed by the action of moisture upon the calcium sulphide, which it generally contains. Any paint in the room containing white lead is thus liable to become discolored, and even the health of the occupants may be affected. It is well, therefore, to test mineral cotton before use in buildings, for calcium sulphide.

Plumbago as a Lubricator.—The *Engineer* gives this example of the value of black lead as a lubricator: "A fly-wheel shaft bearing, eight inches in diameter and ten inches long carried a load of nearly ten tons. The bearing was supported on a box girder, and was lined with good brass. The engine could not be run, as this bearing invariably got nearly red hot after a few revolutions; various oils, tallow, sulphur and gunpowder were tried with most indifferent success. By using a mixture of tallow and sulphur the engine could be run half an hour at a time, and once or twice has run a whole day, the shaft making sixty revolutions per minute. It was determined to have a new crank shaft with a longer bearing, but as at the last moment the use of black lead and tallow was suggested, a package of the ordinary black lead used for stoves was worked up with some tallow, the bearing carefully wiped, and the grease box on the cap filled with the mixture. The bearing never heated again unless oil was allowed to get access to it. The success of the plumbago as a lubricator was perfect. It should be added to the foregoing that while the principle of lubricating by graphite, or plumbago, is scientifically correct, and has in thousands of instances been practically illustrated, it has been damaged seriously by the use of impure graphite. For perfect success the graphite should be absolutely clean."

Deadening of Walls to Sound.—The report of a committee of a Wurtemberg association of architects upon the deadening of ceilings, walls, etc., to sound, gave rise to considerable debate, after which the following conclusions were reached: The propagation of sound through the ceiling may be most effectually prevented by insulating the floor from the beams by means of some porous light substance, as a layer of felt, a filling of sand, or of stone coal dust, the latter being particularly effective. It is difficult to prevent the propagation of sound through thin partitions, but double unconnected walls filled in with some porous material have been found to answer the purpose best. Covering the walls and doors with hangings, as of jute, is also quite serviceable.

Guyard's Violet.—M. Jos. Depierre has recently given some interesting details on this dye before the Societe Industrielle de Rouen. It is obtained in the following manner: A mixture of sulphate of copper and ammonia is treated with ferrocyanide of potassium. If the precipitate obtained is washed, dried and exposed to a temperature of 338° F., it loses both cyanogen and ammonia, oxidizes and assumes a fine violet color. A higher temperature changes the violet to blue, and finally to a pale green. M. Depierre has found that the color resists caustic lime, chloride of lime, hydrochloric acid or tin salts better than any other violet known.

Lubricant for Wooden and Iron Cogs.—A lubricant for iron and wooden cogs, recommended by Bauer as having proved excellent in practice, may be prepared by collecting the oil dripping from the machinery and pouring into it melted waste tallow until it forms a smeary mass, and the mixing with it fine, sifted glass powder. The cogs are rendered hard as well as smooth by the glass pressed into the pores.

Durable Coating for Preserving Zinc Roofs.—According to a German journal, experience is favorable to the introduction of a considerable amount of copper into oily or resinous coatings for zinc roofs, by dissolving some suitable copper compounds in the oils or varnishes employed. It is said that they then unite more intimately with the zinc surface and resist the greatest variations of temperature without scaling off. In their preparation a copper soap, formed by the precipitation of a solution of a copper salt with a solution of soap may be dissolved in the varnish by boiling, or the solution of a copper salt may be stirred into the Russian emulsion-like train oil pigment, prepared by mixing train oil with a solution of soda or potash, with suitable earth colors, so as to form a thin, liquid water color. A durable black coating for zinc roofs was also published by Puscher, consisting of a solution of equal parts of chlorate of potash and sulphate of copper in 36 parts of warm water. The black coating formed on the zinc by its use must be washed and then polished or varnished.

Heliotypic Printing Plates.—Take of glue (Kölner leim) 1 kilogramme, allow it to swell for 24 hours in some cold water, and then liquefy the pieces at a temperature of 25° R., adding 20 grammes of potassium bichromate. Pour this solution over a suitable square of plate glass, previously coated with ox gall and provided with a rim of putty, and allow to dry in a dark place. After the lapse of two days the glue tablet can be readily detached. Now place on the smooth surface the transparent negative drawn in bold lines and strong contrast of lights and shades, or made of perforated cardboard, and expose to the sunlight for from one to three hours. After the exposure glue the tablet with its back side to a smooth wood block, moisten the face with water, and finally remove by means of a moist cloth all glue not hardened under the influence of light, when the *cliche* will show the drawing in perfect relief with a smooth printing surface. After completely hardening the *cliche* in the light, it is ready to be used in the printing press. Galvano-plastic copies of this plate may also be taken in the usual manner.

Rendering Wood Fire-Proof.—For the purpose of rendering wood fire-proof, Col. P. De la Sala dissolves carbonate of potash or soda in water, and, after heating to the boiling point, adds hydrate of lime, graduating the strength so that for potash the specific quantity does not exceed 1.6, and for soda does not go beyond 1.5. With this lye all the exposed parts of buildings, vessels, etc., are saturated, while boards, planks or timbers are immersed in it for a period varying from four to twelve hours, according to the depth of the coating required, or the compactness of the fiber of the wood. For fire protection of building timbers Col. De la Sala considers a fire-proof layer one-eighth of an inch in depth amply sufficient. Veneers must be passed through steel rollers immediately after having been operated upon.

Good Health.

A Medicinal Tree.

A writer from Paris says, there is a palm tree in South America, *Papaya carica*, which possesses very remarkable properties. Its sap is a very powerful digestive agent. Digestion is a very complex act. Meat is digested in the stomach; feculas, already modified by the saliva, achieve their transformation in the intestines, while fatty matters are only digested in the intestine. Hence, the explanation why some persons can digest meats and eggs without difficulty, while their stomachs are rebellious to feculent and fatty substances. Individuals on the other hand, who cannot eat veal, can partake of fatty preparations and pastry without inconvenience. Thus each organ has its role, and on their state of health depends the integrity of digestion. Inhabitants of cities suffer most from dyspepsia, that is, from an alteration of the digestive ferment. It is to this latter class of sufferers that Messrs. Wurtz & Bouchut have investigated the action of the *Papaya*. The latter gentleman has experimented with the preparation since two years, and with success, in the hospital for sick children. The papaya is more generally known in America as the "melon tree;" the fruit is rose-colored, sweet, and is eaten like an ordinary melon; the trunk and the veins of the leaves contain a bitter, milky sap or juice, which, after a short exposure to the air, emits an odor resembling rotten cabbage. The sap exudes when an incision is made in the trunk; it immediately coagulates, and separates into two parts, a more or less soluble pulp, and a limpid colorless serum. Now if this juice in its natural state be placed in contact with raw meat, fibrine, the white of eggs or gluten, it will soften these substances in a few minutes, and in some hours dissolve them at a temperature of 40 degrees centigrade. Milk is rapidly coagulated by the juice, and its caseine precipitated and dissolved. False membranes from croup, and intestinal parasites, as tape worms, etc., are similarly disposed of in a few hours. If a beefsteak be cut up in morsels, placed in a saucer containing some papaya juice, they will be seen to gradually disappear, to melt away as if they were lumps of sugar. Clearly the papaya contains a ferment resembling that peculiar to carnivorous plants, as the drosera, nepenthes, etc. Vegetable pepsine is not exactly a novelty, but that in the sap of the papaya is stronger than what is secreted by the stomach, and possesses this superiority, that it can dissolve nitrogenous matters not only in the presence of a small quantity of acid, but even in a neutral medium, or one slightly alkaline. While weak digestions have reason to rejoice, it is not less important to bear in mind the efficacy of the preparation in the treatment of croup and of tape worm.

Railroad Men and Colors.

A paper on "Libraries of Railroad Young Men's Christian Association," by R. B. Pool, librarian of the Y. M. C. A. of New York city, which was read before the second International conference of Christian railroad men at Altoona, Pa., in September last, contained, in addition to other excellent advice with regard to the collection and management of reading matter for railroad men, the following passage: "The question of color blindness among railroad men is one of vital importance to the great traveling public, one in which personal safety or peril is involved. We know of but two treatises in English on this subject, but every railway library should have one or both. The earliest treatise is by Prof. Holmgren, of Upsala, Sweden, and was published in 1877, entitled 'Color Blindness, and its Relations to Railroads and the Marine.' A translation was published in the report for 1877 of the Smithsonian Institute. Since Prof. Holmgren's work was published we have had Dr. Jeffries' 'Color Blindness, its Dangers and its Detection,' in which he copies a good part of Prof. Holmgren's book; but Dr. Jeffries has made 10,000 tests of his own, of which he gives the results. Those who wish to pursue the study further, in German and French, are referred to Hugo Mangus' Histoire d'Evolution du Sens des Couleurs, 1878 (History of the Evolution of the Color Sense); Herman Cohn, Studien ueber Angehorene Farbenheit, 1879 (Studies Relating to Innate Color Blindness.)"

American Overwork.—One need not dwell upon the desirableness of calm and seclusion for the production of the best literature. With individuals, as with nations, stirring periods of action are not favorable to idealistic art. There is much unfairness, however, in the blame to which public men in this country are subjected for their overwork. This is rather a matter of necessity than of choice. People in the Old World largely inherit their means and methods from their forebears. New men, even there, often have the habit of overwork fixed upon them by the time their footholds are secured. But the statesmen and thinkers of Europe start with assured incomes more commonly than do our own, and are not forced to earn their bread as they go along. Our Wilsons, Evartses, Curtises, have had to consider first the means of living, and to be statesmen or writers in addition. Our Eastern Brahmins, happily, have had for the most part resources which they have enlarged by the help of such gentle, scholarly pursuits, as the service of a university affords. They have shown themselves quite willing to indulge a spirit of restfulness and calm. So long as Americans who do not inherit estates have the Anglo-Saxon pride and domestic tenderness, they will be tempted to do work elsewhere than in a garret, and rarely be able to drive from their minds the thought of its effect upon an income-paying constituency.—*E. C. Stedman on Bayard Taylor, in Scribner for December.*

Milk Diet in Heart Disease.—M. See, in his book on the treatment and diagnosis of heart disease, regards milk as a powerful diuretic. He does not approve of exclusive milk diet, which, in his opinion, reduces the patient to a state of extreme inanition, but prescribes a mixed milk diet of about two liters and a half of milk per diem added to the patient's usual food. This does not in the least interfere with the diuretic effects of the milk. These effects must not be attributed merely to the water contained in the milk, as has been supposed by some authors, because the same quantity of pure water would in no wise produce the same results. It is evident, therefore, that only the sugar and salts possess the diuretic properties, their action being similar to that produced by salts of potash and soda by their osmotic power. These diuretic properties seem to be much more powerful when the milk has not been boiled. It should, therefore, be taken unboiled, and fresh from the cow if possible, or, at least lukewarm, as cold milk does not act in the same way. It seems as if boiling the milk destroyed these properties; nevertheless, it must never be forgotten that some patients can digest milk only when boiled, so that the rule is not without exception. Another curious point in the action of milk is that it is equally powerful in cases where the cardiac affection is not combined with dropsy. M. See has often observed that patients who either no longer suffered from dropsy, or never had suffered from it, were extremely benefited by a mixed milk diet. The action of the heart became much calmer and more regular and the palpitations disappeared altogether.

Aloes as a Dressing for Wounds.—Dr. Millet, a French army surgeon, recommends powdered aloes as a dressing for wounds, both as a means of favoring cicatrization and for closing them. It is said to relieve the severe pain of wounds almost immediately, and requires to be renewed only at long intervals.—*Boston Medical and Surgical Journal.*

MINING AND SCIENTIFIC PRESS.

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SAN FRANCISCO:
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The Week.

The principal item of interest in connection with mining matters during the past week has been the change of management of the Gould & Curry mine on the Comstock, by which Alvinza Hayward and W. S. Hobart assume control. Mr. Hayward also now controls the Hale & Norcross and Yellow Jacket. The proposition to stop pumping in the Savage mine is a somewhat surprising one. After pumping constantly for three years they have concluded it will cost too much to do it three or four months longer. Of course the water will rise in the Hale & Norcross to the 2000-foot level, and prevent all work below. They will stop pumping until a drift has been run to connect the Combination shaft and Savage incline in the 2300-foot level, after which the water will run into the shaft and be pumped to the Sutro tunnel. It has cost $50,000 per month to work and drain the mine. The action is pretty rough on the Hale & Norcross people, who will have to build bulkheads to keep the water out, or else pay to keep the Savage pumps running.

PERSONAL.—We send a large number extra of this 24-page issue of the PRESS to persons engaged in the industries specially represented by our paper, with the hope that they will examine its pages and fairly consider its claims for patronage. Should any receive copies (duplicate or otherwise) for which they have no use, they will confer a favor by passing the same over to others likely to be interested in such a publication. Assistance in increasing the circulation of our paper will give us greater power for usefulness. We shall strive earnestly to make the MINING AND SCIENTIFIC PRESS worthy of the grand field it occupies.

Our Journalistic Efforts.

The present number of the MINING AND SCIENTIFIC PRESS is submitted to the critical and learned reader as worthy of his support. We flatter ourselves that a glance through the pages before him will convince him, if he is not a subscriber, he ought to be, and that it will be for his personal benefit to be a constant instead of a casual reader.

To our old and valued subscribers it is but an earnest of our endeavors to increase the value and interest of the PRESS and furnish to them such material for instruction and thought as will aid them in their walks of life.

As an exponent of the mining and mechanical industries of this coast, and of popular science, the MINING AND SCIENTIFIC PRESS has been laboring for many years. None of these branches run in grooves as in years gone by; there is no direct path by which they are to be followed; no royal road to the acquirement of their details. The branches and ramifications of the arts and sciences are endless, and the details of each offshoot a study in itself. No man in active life can be expected to have time to acquire intricate technical knowledge of many kinds; but all intelligent ones want at least an idea of what their co-workers are doing and want every item of information in their own branch.

The mission of the PRESS is to gather, digest and condense the results of observation and work in the various branches it represents, presenting it in a form in which the reader may acquire the knowledge necessary to him with the least possible trouble. Such things of importance as come up are given in detail, while others of less practical utility are presented so that a clear understanding may be had of them without tedious study or undue loss of valuable time.

It is unnecessary to call attention to special articles, they speak for themselves. We have, of course, as usual, given prominence to such as will interest the miner and metallurgist. We expect the coming year to make many improvements in our journal. Our list of correspondents has materially enlarged, and now includes many names well known to the mining community as experienced miners and metallurgists. We keep close watch on all improvements likely to prove of practical utility to our patrons, whether originating at home or abroad, and our many years' experience admits of a discrimination in this respect which is useful to our readers.

The widespread interest in mining matters, which has extended to the shores of the Atlantic, argues a new era of prosperity to our coast, with which we shall keep pace. The prospects of the season are most encouraging, and the industrial classes of this coast have reason to congratulate themselves on their lot.

MINERAL SURVEYORS.—U. S. Surveyor-General Wagner is going after the U. S. deputy mineral surveyors about something which needed correction long before this. These deputies are many of them in the habit of making what are represented to be official surveys of mines, without instructions from the Surveyor-General's office, and returning such surveys to the courts or other officers instead of to the head office. He now apprises the deputies that U. S. deputy mineral surveyors have authority to perform in that capacity only such work as may be assigned them by the Surveyor-General's office—their appointments being in no sense roving commissions. When called upon by private parties to make surveys not ordered by the office, they should make them as private individuals, signing their names without reference to their positions as U. S. deputy surveyors.

SENATOR BOOTH has introduced a bill providing that where settlers enter upon lands supposed to be public, and subsequently fail to acquire titles, the fees and commissions they have paid in good faith shall be refunded to them.

THE Comet mine of Montana has been sold.

The Prosperity of Mining Districts.

When the reputation of a mining district rests alone upon the fictitious value placed upon the stocks of that few of its mines which are listed in the Stock Board, as is too frequently the case, that district must expect vicissitudes which will be far from pleasant. Those values are much too dependent on influences out of control of those most directly interested in the welfare of the mines themselves to be altogether agreeable. The desires or manipulations of a few operators exercise an influence which is unhealthy to the general prosperity of a group of mines. A disastrous termination to a stock scheme may be fatal to the prospects of a whole district.

This has happened scores of times, and, no doubt, will continue to happen so long as miners prefer to sell half developed mines to working them themselves on a small scale. Two or three dozen prosperous little mines in a district worked by their owners do much more for the neighborhood and the camp than one big one worked by a company of non-residents.

The manipulations of a set of sordid, unscrupulous operators in Idaho mines, a few years ago, set that Territory back many years in its mining development. So disastrous were the results and so shame-faced the schemes that California capital has hesitated ever since to invest in Idaho mines, and the people are afraid of them. Yet the mines are good—far better, indeed, than many in the market now. Similar instances might be cited with relation to a number of districts.

A camp to be prosperous, permanently so, must depend on its bullion product more than on the stock value of its prominent mines. The fact that a dozen mines of a district are quoted in the market is by no means a sure indication of good times. The fact, however, of weekly bullion shipments, is such an indication. It is to the mines themselves, therefore, that we must look for the basis of permanent prosperity; not for what they can be sold for, but for what they can and do produce.

Mining Superintendents.

The choice of superintendents in inaugurating any new mining enterprise is so very important a question, as involving more or less the prosperity of the mine, that it should never be settled without proper consideration; yet it is a question often settled at the first meeting of a new company, and without any very special examination into the capabilities or knowledge of the candidate.

That often used phrase, "gentlemanly superintendent," does not cover by any means all the requirements of the executive manager of a mine. Nevertheless, social qualities are as apt many times to influence a decision of this kind as sterling merit of rougher grain.

As a rule the mining men of this State and Nevada have had their eye-teeth cut in the matter of superintendents. In newer mining countries, mistakes which we have outgrown are still prevalent and people will have to learn by their own experience.

Ruinous failure is too often the result of a misguided choice of superintendent of a mine. There are plenty of competent men to fill the places, but unfortunately there are still more incompetent ones, and the latter are apt to be the more persistent in their applications. We have no doubt that among the many mining ventures now being organized in the East, dozens of failures, to be laid to the mines, will occur through the superintendents alone. It is safe to predict this. The directors will want to put in men of their own acquaintance, with more regard to their faith in a business capacity than their experience in mining matters. Yet it is possible to combine these qualities and in a high degree. There are hundreds of men on this coast with an experience of half a lifetime to back them.

Our own fear in this connection is more for the injury indirectly done to the mining industry than that to individual mining companies, which can only blame themselves. If to oblige some important man among them, the directors send his nephew, cousin or friend, simply because he is a nephew, cousin or friend, without questioning his ability and experience, they will reap as they sow, and should blame none but themselves.

It will be just as well therefore if our Eastern friends in engaging their managers, make no extended contracts as to the time of employment, in case they find they have made a mistake, and consider it necessary to replace them.

THE United States Board of Trade adopted a resolution for a committee to award a prize of $1,000, offered by a member, to the person who should draw up for passage by Congress the best Act looking toward the regulation of the sale of food and the prevention of adulterations thereof.

PARAFF, formerly of "Bull-Butter" fame in California, and later the man who swindled the Chileans by making them believe he was getting lots of gold out of copper ores, has been granted a full pardon by the Chilean Government in consideration of important services at the artillery barracks.

Formation and History of the Comstock.

We received this week copies of the new book, entitled "The Comstock Lode, Its Formation and History," by John A. Church, E. M. Ph. D., the expected publication of which we have previously mentioned. The volume contains the results of studies which have been made from the standpoint of the miner rather than from that of the stratigraphical geologist, and the lessons derived from mining experience have received special emphasis.

The greater portion of the book was originally prepared as a report to the Chief of the United States Surveys, and covers but one part of the great problem which the Comstock region offers to the mining engineer.

The following index to chapters will give the scope of the work better than an extended review: Chapter I, The Comstock mines; II, the Comstock lode; III, The lode rocks; IV, History of the lode rocks from the beginning to the formation of the quartz bodies; V, Formation of the ore quartz, and position of the bonanzas; VI, Description of the mines; VII, Position of the ore; VIII, Summary; IX, Considerations which affect the Comstock. These are the search for bonanzas, depth of lode, parallel quartz bodies, future yield, zonal arrangement, ore channels, the divide, the east clay, position of ore bodies, crushing, etc. Chapter X is devoted to general considerations, and XI and XII to the Justice lode, and to Heat Phenomena.

The work is fully illustrated with very clear and well-made colored engravings, showing ore bodies and details of underground work. It is handsomely printed on heavy tinted paper. There are so many points of interest in this book to be noticed, that it is scarcely worth while to particularize them, since every page will repay close perusal. The statistics given in connection with the yield, etc., are brought down to latest dates.

Dewey & Co., 202 Sansome street, publishers of this journal, have the sole agency here for the sale of this work, and a limited number of copies have been placed in their hands to dispose of at publisher's rates—$8 per volume. An agent will shortly call upon some of our mining engineers and experts with a copy for their inspection.

In this connection, attention is called to the diagram on another page of this issue, showing a longitudinal section of the famous lode. It is engraved from a recent map, and the ore bodies are all marked, as well as the proper depths of shafts, inclines, etc.

A Decision in the Lick Estate Case.

It will be recollected that before James Lick, the millionaire, died, he made a deed of trust, giving his vast fortune to certain trustees, who were to distribute it according to the terms of the trust among a number of beneficiaries. A large sum went to the University of California for an astronomical observatory; money was donated to establish public baths in the city, an Old Woman's home, etc., etc. The residue of the estate was to be divided equally between the California Academy of Sciences and the California Pioneers.

Although Mr. Lick's son, John Lick, was one of the trustees, he refused, after a time, to act as such. He and the other heirs were disposed to contest the deed of trust, but a compromise was effected by which he was to receive $383,000, and release the estate from further claims. It was determined to take this compromise money from the residue belonging to the Academy and Pioneers, and an amicable suit was brought to ratify the compromise.

The Academy of Sciences objected to paying from their share half the compromise money, arguing that since all would be benefited, all the beneficiaries should contribute pro rata. The question was submitted to the courts, and Judge Wheeler decided a pro rata arrangement was impossible, and that the residuary legatees should pay the compromise money.

The Academy of Sciences appealed the question to the Supreme Court, which on Wednesday affirmed the previous decision. The compromise money must therefore be paid from the residuary shares of the Academy of Sciences and Pioneers. It is hoped this will lead to the immediate distribution of the property by the trustees, which has been too long delayed. It is hardly probable that anything will be realized from the estate by either the Pioneers or the Academy, outside of the lots on Market and Fourth streets which they hold under separate deeds, for the simple reason that the estate is not large enough.

However, both of these societies can sell their property if they choose, although they will be unable to carry out the idea of the donor, which was to erect magnificent buildings upon the lots, for which purpose the residuary amounts were to be utilized. Neither society will now be able to do this unless more than is expected is realized from the sale of the property of the estate.

WE have on hand a description of the Hoffman leaching process, written by Guido Kustel, which we are obliged for want of space to lay over until next week. It describes a method of working auriferous silver ores.

DOUBLE SHEET—24 PAGES.

Preliminary Reports on Mines.

We have been favored by M. l'Aasoa, examiner of mines, No. 6. California street, in this city, with the followiag useful memoranda, which we are sure will be appreciated by the miniag commuaity. The form of report will be very handy for refereace:

The subjoiued form for synoptical reports oa miniag properties, briefly filled out for exemplificatioa, is inteaded to supply a want which many have doubtless folt in commoa with the writer.

In correspondeace with miaers coacerning their mines aad prospects, I bavn oftea found it difficult to obtain the informatioa desired in a succinot and oompeadious form readily available for reference. The statemeats received are too generally diffuse and iudefinite, often omittiag the points most essential ia determining whether or aot a mining property is worth further consideration and the trouble of a proper inspection.

It is no aew thing to say that my fellow-miaers are a sanguine class, lavish of hyperhole aad proae to accept aud announce a phantom bope for fact; but I am aware that in maay instaaces their exaggerations and ambiguities are intentional substitutes for exact statements of fact which, if givea, wonld bar the hope of sale or examiaatiou of their properties.

To such, the following arrangemeat will prove an anwelcome catechism; but to those who desire to attract the attention of investors to really meritorious mines, it will doubtless be helpful in condeusing and systematizing their statements.

I fiad that a blank of this character, sent to be filled out as fully as possible, while eliciting all needful data for the imuediate purpose, confines the informant to definite limits; saves time aad simplifies his work and mine.

With slight modifications, this form may be used for descriptioas of placer miaes; aad when printed in a note book, with such changes or additions as iadividual experience may suggest, will also be of service in the field, to miniug eagineers, experts and others, as a concise and methodical record, besides keepiag in view the scope and essentiale of enquiry.

Form for Report.

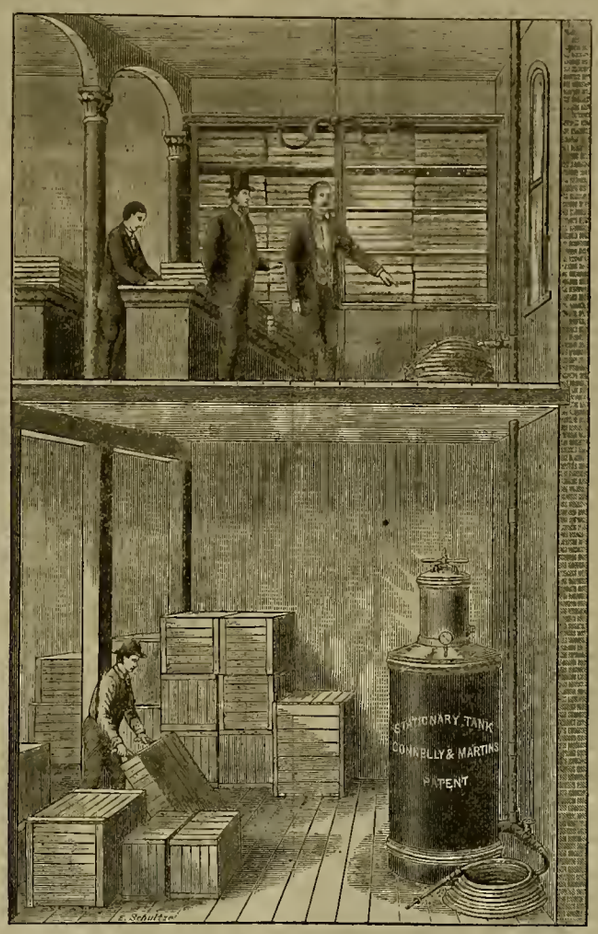
Name of mine	Blank mine,
Mining district	Hassayampa district,
Locality, etc	Yavapai Co., Arizona.
Date of location	April 1st, 1878.
Where recorded	Recorded at Prescott.
Names of locators	John Smith and others.
Names of present ownors	John Smith and others.
Present title	Discovery claim (not patented).
Dimensions of claim	Six hundred by fifteen hundred feet.
Description of mine	A gold and silver-bearing velo.
Character of gangue	Quartz.
Average width of velo	Thirty-six inches.
Strike of vein	Northeast.
Dip of vein	About 60°.
Extent of outcrop	Lineally 4,000 feet; occasionally bold.
Character of footwall	Gneiss.
Character of hanging wall	Clay-slate.
Hardness of walls	Easily worked—no blasting yet.
Gouge or selvedge	Clay seam of variable thickness.
Assays of the ore	Lowest, $54; highest, $682.
Gold, per cent	23% gold.
Silver, per cent	77% silver.
Base metals contained	Pyrites, galena, traces of copper.
Character of ore	Chloride 30 feet down; sulphide below.
How chiefly occurring	Well distributed through the vein.
Amount of ore in sight	Not estimated.
Ore extracted, not worked	About 70 tons.
Estimated value	$100 per ton.
Ore worked	Twenty tons.
Method of reduction	Roasted, dry-crushed and panned.
Average yield per ton	$108 per ton.
Cost of extraction	$3.50 per ton.
Cost of reduction	$20 per ton.
Reduction works, etc	None belonging to the mine.
Drainage requirements	Eight-inch pump needed at present depth.
Drainage facilities	Drainage by adit not practicable.
Development work done	A shaft, 5x5 feet, down 55 feet; drift from bottom 32 feet on the lode.
The water supply	Fifty inches free water seven months.
The timber supply	Forests of pine and oak adjacent.
Wood, per cord	Delivered at $3 per cord.
Nearest wagon road	A road to the mine.
Nearest important town	Prescott.
Topography	Mountains, deep canyons, etc.
Climate, altitude, etc	Temperate; elevation, 6,000 feet.
Other information	
Price asked (cash)	
Time and terms of bond	
Other conditions, etc	
Remarks	

QUICKSILVER.—For two years past parties have been engaged in tunneling a bill on the ranch of A. S. Howard on Marsh creek, in search of cinnabar. The Antioch *News* says the tunnel is in about 150 feet, and it is authoritatively reported that a vein two feet in thickness and well defined has been discovered during the past few days. Richard Matthews is the name of the gentleman who has made the discovery and he thinks he has an excellent prospect. The croppings, extending for miles from the Marsh ranch toward the Mount Diablo foothills, indicate a quicksilver vein. Parties have prospected at times for several years, but this is the first discovery that promises good results.

Chemical Engines.

We show herewith eagravings of two form of the Coanelly fire extinguisher, for which Messrs. Parke & Lacy, of Nos. 21 and 23 Fremont street, are now agents for this coast. The Coaaelly & Martin extinguishers are aow in use iu maay mills, factories, depots, public buildiugs, hotels, theaters, steamships and steamboats. They are made in sizes varying from 100 to 600 gallons in capacity; are simpln in construction, easily operated, aad in case of fire caa be brought into use ia less thaa 10 seconds.

Ia buildiags, factories, etc., the apparatus is located on the ground floor or in the cellar, with stand pipe running to the top story, having connections and hose on each floor, so that it can instantly be brought into use in any part of the building.



CONNELLY & MARTIN SYSTEM OF FIRE EXTINGUISHING.

This system is especially adapted for nse on steamships and ocean vessels. The dry gas apparatus is so constructed that carbonic acid gas can be instantly discharged into the hold of a ship while at sea, and in a moment extinguish a fire of any dimensions, it being under perfect control of the eagineer.

The stationary apparatus charged with water impregnated with carbonic acid gas can be brought to play instantly upon a fire in the cabin or outside of the vessel, extinguishing the fire without damage from the liquid.

One of our engraviags show the system applied in a building. The other engraving is the Connelly warehouse extinguisher, designed for warehouses, hotels, farm houses, mills, etc. It has a capacity of 40 gallons, and being mounted on substantial wheels two feet in diameter, can be easily transported and operated by one mau. It being always under pressure there is no necessity for agitation when its services are needed; and being provided with two valves, the operator, on opeoing the one at the apparatus, is free to operate the nozzle, so no time is lost in bringing it into use. It contains no acid and the discharge has no injurious effect upon goods or furniture. This is specially useful ahout quartz mills, hoisting works, etc., being readily moved by one person to where it is needed.

BEEHIVE MINE.—The team of Jesus Bastilo of La Porte brought into town on Thursday morning, from the Beehive quartz miue, Mount Hope, near Forbestown, ahout three tons of sulphurets consigned to E. H. Pratt to he forwarded to San Francisco to be worked. This is probably the most valuable load of freight ever brought to the town from the mountains. We have not been able to learn exactly the estimated value of the load, but we are told that it is among the thousands. When the contemplated Edison reduction works are erected in our town, it will no longer be necessary to send sulphurets to San Francisco to have them worked.—*Butte Register.*

Amalgamating Plates.

Withiu the past few years the practice of usiag silver-plated copper plates for amalgamatiag purposes in mills has become qaite common, and all of our best mills are now supplied with them, maiuly from the San Fraacisco Platiug Works, where a specialty is made of this kind of work. The method by which the platiug is doue there is simple, but it is hardly practicable without special appliances. Miners in isolated camps or in places where time is lost in sending so far, or those persoas who wish to test the efficacy of the silver-amalgam coating, can prepare the plates themselves in a simple manner and without the use of electricity.

To do this, take 10 or 12 half-dollar pieces (greenbacks even at par won't answer) and drop them into a glass or porcelain vessel containing nitric acid. The action of the acid will give them a solution containing nitrate of silver and nitrate of copper. This solution should be diluted with water free from saline material. Into this solution enough quicksilver may be poured to form a pasty mass with the silver,

CONNELLY PORTABLE EXTINGUISHER

with which it amalgamates to form a silver amalgam.

The nitrate of silver is decomposed by the presence of the metallic mercury. A portion of the nitric acid will form nitrate of mercury, which will be lost, and the metallic silver set free from the silver amalgam. The solution poured off will then contain nitrate of copper and some nitrate of mercury.

Take the residue and strain off the excess of mercury through a buckskiu bag, and there will remain a solid mass of absolutely pure silver amalgam. The copper plates should be prepared to receive this by heiag thoroughly oleaaed with a solution of nitric acid, aad when the amalgam is spread over the copper a fine silvered surface is presented. Take a fine broom and draw *across* the plate and little fiae ridges of silver amalgam are formed, the plate being thus heneficially roughened.

The plates thus prepared will he fouad to act a great deal better than plain copper plates simply coated with mercury, aud the silver can of course he obtained whenever the plates are done with. The coating will not of course last as loag as if it were electroplated on the copper, but the operation cau always be repeated at any time. Care must he taken in handliag the acid, or the hands will be burned.

For quicksilvering plated plates, quicksilver should be rubbed on with a piece of flannel, using water—no acids or cyanide of potassium. In quartz mills the silvered plates should not have a fall of over three or four inches to 12 feet, as silvered plates should have less fall than plaia copper plates. If they do aot keep free, more water should be used to carry off the sands. To remove the amalgam a piece of leather or rubber belting should be used, bat a metal scraper is objectionable.

A silver-plated surface will hold more quicksilver, and will aot turn green or corrode like the copper plates. It is always therefore in condition to save the amalgam or amalgamate the gold. The quicksilver is absorbed as soon as applied.

Railroad Building.

We seem to be entering on an era of railroad building similar to that which prevailed a few years ago. New roads are being projected in all quarters. Several lines are being projected to Omaha and the West, the city just mentioned being an important termiaal point. Oregon and Washington are about to develop the immense resources of their great and important territories by means of new lines of road, and soon the West will he as well seamed with them as the East. Two hundred miles will be constructed next year, which will briag millioas of acres, with all their maguificent resources, within reach of shipping points. Fifteen hundred tons of rails are now on board the ship Orient, bound from Cardiff to Portland. The line will extend from the Dalles to the Walla Walla railroad, thence to Snake River and to the heart of what is known as the Palouse country. This will connect with the North Pacific, in which rapid progress is making.

The lines from the West to California will probably he pushed partly through next year. The Southern Pacific branches will be rapidly approaching the Rio Grande on the one hand and the Mexican border on the other. A line from Utah will he threading its way towards San Diego.

An important question is how far all this will inure to the benefit of San Francisco. With the exception of the Oregon and Washiugton roads, as far as we are now advised, very little. If the overland lines all center on the Southern Pacific, it will rather be to its detriment, for the policy of that line is opposed to the interests of our city. Already the trade of Arizona is slipping away in consequence of the discriminations made in favor of Eastern shippers. Nor is this all. Some time since a Los Angeles merchant commenced shipping potatoes to Arizona, and sent four carloads thither at $100 per car. On learning that they had been sold to advantage, the agent raised the price per car to $400, or 2 cents per pound. Now, when it is remembered that potatoes, after having been shipped from the country to San Francisco, have sold as low as 20 cents per sack, or one-fifth of a cent per pound, the effect of a freight that charged ten times the first cost at one time, or four times that cost now, may be estimated. Now, the trade of Arizona in this one item might be developed to great extent, as at the rate of only ¼-pound per day to each person, a consumption of a couple of hundred cars inn year would he the result. No line will he of the least use to San Francisco which does not terminate in this city or at some seaport where n cheap steamer line can be laid on. Then we will have a chance, through cheap oompetiag freights, to take our share of the trade of the Mississippi Valley in grocery goods, in teas, sugars and coffee, which reach an imported value annually of one hundred and forty millions of dollars.

Short lines of roads from the Sacramento and San Joaquin rivers into the mountains would be of inestimable benefit to the State, in bringing all its farming lands within reach of cheap water transportation to this city. San Francisco must have a railroad policy for herself.

SALE OF MINING GROUND.—The tract of gravel ground adjoining the Planet Company's claim, between Steep Hollow and Bear river, has been purchased by M. Byrne, Jr., of Grass Valley, from its former owner, F. McGuire. From the developments made on either side of the ground, it has been demonstrated that an extensive gravel channel must run through it.—*Grass Valley Union.*

The Metric System.

The metric system of measurement, which a few years ago was confined to a single country, is rapidly spreading in use, and the people of all nations are more or less familiar with it. All scientific documents, papers, proceedings, etc., cite items of measurement under this system, and in all the learned professions it is necessary to understand the system thoroughly. It is much better adapted to the ordinary business of life than the varying table of measurement now in use, if people would but take the trouble to give it thought enough to understand it.

"Measure all lengths in meters, all capacities in liters, all weights in grams, using decimal fractions only, and saying deci for tenth, centi for hundredth, milli for thousandth, deca for ten, hecto for hundred, kilo for thousand, and myria for ten thousand."

This sentence comprises the entire system, for surfaces and bulks are simply the squares and cubes of the measure of length, and the "ar" and "ster" are only other names for the square decameter of land, and the cubic meter of firewood.

The meter (measure) is one-ten millionth of the distance from the equator to the pole, and equals the distance from the tip of the fingers to the center of the opposite breast. Four steps equal three meters. The width of the hand is a decimeter; and of the fingers, two centimeters. The liter (capacity) is simply the cube of a decimeter (tenth measure) in the more convenient cylindrical form; and the gram (weight) is simply the weight of a cubic centimeter (hundredth measure) of water.

Definition of the Various Measures of Metric System.

	Meaning.	*Spelling.*	*Pronunciation.*	*Illustration.*	*Abbreviation.*
	length	meter	meter	like gas meter	m.
	capacity	liter	leeter	as in pique	l.
	weight	gram	gram	as in drain	g.
	tenth	deci	desi	like decimal	d.
	hundredth	centi	senti	like cent	c.
	thousandth	milli	mili	like mill	m.
	ten	deca	deka	like decalogue	D.
	hundred	hecto	hekto		H.
	thousand	kilo	kilo		K.
	ten thousand	myria	mirra	like myriad	M.
To these ten are sometimes added:					
	surface	ar	ar	area	a.
	solidity	ster	ster	stereoscope	s.

The names *meter*, *liter* and *gram*, are from Greek words, understood in all modern languages to mean a *measure* (as a gas-meter, water-meter, etc.) a *capacity* and a *weight*. As the metric system is now used by most nations and will soon be universal, the names understood by all nations are used, instead of *measure*, *capacity* and *weight*, which would be understood only by the English. For the same reason the fractions are not called *tenth*, *hundredth* and *thousandth* in English, but by their Latin names, *deci*, *centi* and *milli*. The large quantities, instead of *ten*, *hundred* and *thousand*, are called *deca*, *hecto*, and *kilo* the Greek words for these numbers. These words are short, avoid all danger of confusion, are understood by all nations throughout the world, and so are very much to be preferred. We therefore say, not *hundredth measure*, but *centimeter*. Not *one thousand grams*, but *kilogram*, etc.

Each prefix is an independent word, accented on the first syllable, and retains this accent in the compound, cen'timeter, not centim'eter, etc. The abbreviation for the compound is simply the letters for the two parts, dm. for decimeter, Dm. (with capital) for decameter. For shorter names of the compounds, pronounce only the prefix and the first letter of the unit, saying centim, millim, decil, hectog, etc. The system will be understood best by remembering that our system is really a part of the metric system. The dollar is *value*, as the meter is *length*, the liter is *capacity*, and as the gram is *weight*. A decadollar we call an eagle, a decidollar a dime, and the centidollar and millidollar are shortened to cent and mill. Both the money and metric system correspond perfectly to our arithmetic.

The following will show still more clearly the application of the prefixes, and being in a convenient form for reference, is worthy of preservation:

Deci. expresses the.....10th part.
Centi. " " .....100th part.
Milli. " " .....1,000th part.
Deca. " " .....10 times the value.
Hecto. " " .....100 times the value.
Kilo. " " .....1,000 times the value.
Myria. " " .....10,000 times the value.

There are no tables, or scales, or complicated relations. With the meter, every possible dimension (length, surface or solidity) can be measured; with the liter, every possible capacity; with the gram, every possible weight. The single sentence above takes the place of compound or denominate numbers in our arithmetics; and as a result large committees of our ablest teachers report that a full year may be saved in the school-life of every child. The gain in commerce is much larger, for a single multiplication or division gives an absolutely accurate result, where the common system requires several operations to get often only an approximate answer.

Measures of Length.

Millimeter,	mm.	equals	.001	m
Centimeter,	cm.	"	.01	m
Decimeter,	dm.	"	.1	m
Meter,	M.	"	1	m
Decameter,	Dm.	"	10	m
Hectometer,	Hm.	"	100	m
Kilometer,	Km.	"	1,000	m
Myriameter,	Mm.	"	10,000	m

The meter, or unit of length equals....39.37 inches.
.....3.28 feet.
.....1.09 yards.
.....19 rods.
.....0006 miles.

Measures of Surface.

Centar ca. equals.....1 sq. m
Are A. " .....100 sq. m
Hectar Ha. " .....10,000 sq. m

The are, or unit of surface, is a square the side of which is ten meters and surface 100 square meters. In U. S. surface measure, it equals

155,006. square inches.
1,076. square feet.
114. square yards.
3. square rods.
.098 square rood.
.024 square acre.
.00003 square mile.

Measures of Capacity.

The liter, or unit of capacity, is a vessel whose volume is equal to a cube whose edge is one-tenth of a meter and capacity one one-thousanth of a cubic meter.

Millimeter,	ml.	equals	.001		1 = 1 cu. cm.
Centiliter,	cl.	"	.01		1
Deciliter,	dl.	"	.1		1
Liter,	L.	"	1		1 = 1 cu. dm.
Decaliter,	Dl.	"	10		1
Hectoliter,	Hl.	"	100		1
Kiloliter (or Ster)	Kl. st.	equals	1,000		1 = 1 cu. m.

The liter equals.....61.027 cubic inches.
.....035 " feet
.....8.453 U. S gills.
.....2.113 " pints.
.....1.056 " quarts.
.....264 " gallons.
.....7.043 Imperial gills.
.....1.760 " pints.
.....880 " quarts.
.....220 " gallons.
.....110 " pecks.
.....027 " bushels.

Weights.

Milligramme	mg.	equals	.001	g
Centigramme	cg.	"	.01	g
Decigramme	dg.	"	.1	g
Gramme	G.	"	1	g
Decagramme	Dg.	"	10	g
Hectogramme	Hg.	"	100	g
Kilogram (Kilo.)	K.	"	1,000	g
Myriagramme	Mg.	"	10,000	g
Quintal	Q.	"	100,000	g
Ton	T.	"	1,000,000	g

The Gramme equals.....15.434 grains.
.....0321 ounces troy.
.....0352 ounces avdps.
.....0026 pound troy.
.....0022 pound avdps.

Gramme equals weight of.....cu. cm. of water
Kilo. " " " .....cu. dm. of water
Ton. " " " .....cu. m. of water

We append the following tables, which give, in a condensed form, a comparison of other measures with the metric system, and by means of which anyone can institute comparisons readily. They must not be understood as tables of the system, for as before stated, there are no tables or scales at all. It will be seen that the single prefixes do away with all the necessity of having a separate set of tables for each class of measures and a separate name for each subdivision of each class.

Long Measure.

	Miles.	Furlongs.	Rods.	Yards.	Feet.	Inches.
1 Millimeter						.0393
1 Centimeter						.3937
1 Decimeter						3.9370
1 Meter				1		3.3707
1 Decameter			1	5	1	3.7079
1 Hectometer			19	4	2	7.079
1 Kilometer		4	38	4	1	10.79
1 Myriameter	6	1	28	2		11.9

Square Measure.

	Acres.	Sq. Rds.	Sq. Yds.	Sq. Ft.	Sq. In.
1 sq. Millimeter					.0015
1 sq. Centimeter					.1550
1 sq. Decimeter					15.5005
1 sq. Meter or 1 Centiare			1	1	110.0501
1 Are		3	28	7	07.0105
1 Hectare	2	75	11	5	35.0522
1 sq. Kilometer	247	18	8	6	121.2241

Cubic Measure.

Measure of Volumes.	Cubic Yds.	Cubic Ft.	Cubic In.
1 Milliliter			.0610
1 Centiliter			.6103
1 Decliter			6.1027
1 Liter			61.0270
1 Decaliter			610.2705
1 Hectoliter		3	018.7051
1 Kiloliter or Stere	1	8	547.0515
1 Myrialiter	13	2	286.5110

Liquid Measure—(U. S. Gallons).

Measures of Volumes.	Gallons.	Quarts.	Pints.	Gills.
1 Milliliter				.0084
1 Centiliter				.0845
1 Deciliter				.8453
1 Liter		1		.4539
1 Decaliter	2	2	1	.5396
1 Hectoliter	26	1	1	1.3963
1 Kiloliter or Stere	264		1	1.0638
1 Myrialiter	2641	3		3.6380

Measures of Volumes.	Dry Measure. (U. S. or Winchester bushel.) Bushel.	Pecks.	Quarts.	Pints.	Dry Measure. (Imperial bushel.) Bushel.	Pecks.	Quarts.	Pints.
1 Milliliter				.0018				.0018
1 Centiliter				.0181				.0176
1 Deciliter				.1816				.1761
1 Liter				1.8162				1.7608
1 Decaliter	1	1		.1026		1		1.6077
1 Hectoliter	2	3	2	1.6264	2	3		.0774
1 Kiloliter or Stere	28	1	4	.2644	27	1		.7737
1 Myrialiter	283	3	1	.6440	275		3	1.7369

Weights.	Troy Weight. Pounds.	Ounces.	Pwts.	Grains.	Avd's Weight Pounds.	Ounces.	Drams.	Grains.
1 Milligramme				.0154				.0154
1 Centigramme				.1543				.1543
1 Decigramme				1.5432				1.5432
1 Gramme				15.4323				15.4323
1 Decagramme			6	10.3234			5	17.6047
1 Hectogramme		3	4	7.2348		3	8	11.9848
1 Kilogramme*		2	8	3 .3487		2	3	4 10.4737
1 Myriagramme		26	0	10 3.4874		22		11 22.7061
1 Quintal		267	11	1 10.374		220	7	6 8.3115
1 Millier or Tonneau		2679	2	14 12.74		2204	9	15 1.0837

*The Kilogramme is the unit of commercial weight, and is 2 1-5 pounds avoidupois.

Weights.	Apothecaries Weight. Lbs.	Ozs.	Drams.	Scruples.	Grains
1 Milligramme					.0154
1 Centigramme					.1543
1 Decigramme					1.5432
1 Gramme					15.4323
1 Decagramme			2	1	14.3234
1 Hectogramme		3	1	2	3.2348
1 Kilogramme	2	8	1		12.3487
1 Myriagramme	26	9	4		3.4874

Measures of Volumes.	Medical Divisions of the Gallon. Galls.	Pints.	Ounces.	Fluidrams.	Minims.
1 Milliliter					16.2316
1 Centiliter				2	42.3161
1 Deciliter			3	3	3.1610
1 Liter		2	1	6	31.6106
1 Decaliter	2	5	2	1	16.1059
1 Hectoliter	26	3	5	4	41.0586
1 Kiloliter	264	1	7	6	50.5859
1 Myrialiter	2641		14	4	25.8593

Table of Proportions—Including Length, Surface, Capacity, and Weight.

Measures of		Proportions.
Length	Millimeter	1,000th part
	Centimeter	100th part
	Decimeter	10th part
	Meter	1
	Decameter	10 times
	Hectometer	100 times
	Kilometer	1,000 times
	Myriameter	10,000 times
Surface	Centiare	1
	Are	100 times
	Decare	1,000 times
	Hectare	10,000 times
	Kilometer or Stere	100,000 times
	Myriare	1,000,000 times
Capacity	Milliliter	1
	Centiliter	10 times
	Deciliter	100 times
	Liter	1,000 times
	Decaliter	10,000 times
	Hectoliter	100,000 times
	Kiloliter or Stere	1,000,000 times
	Myrialiter	
Weight	Milligramme	1,000th part
	Centigramme	100th part
	Decigramme	10th part
	Gramme	1
	Decagramme	10 times
	Hectogramme	100 times
	Kilogramme	1,000 times
	Myriagramme	10,000 times
	Quintal	100,000 times
	Millier or Tonneau	1,000,000 times

The metric system, by which so much is accomplished, has now been adopted by 28 different nations, including a majority of the civilized world. In 11 countries it is in exclusive use; and in several, like Germany and France, there are penalties for using any other measures.

The educational society incorporated to secure this result desires the co-operation of every friend of economy and education, and will gladly send full information to applicants who address the American Metric Bureau, Boston.

NATIVE BRITISH SILVER AND GOLD.—The quantity of silver obtained in 1878 from British mines was 397,471 ounces, and most of the precious metal was found in combination with lead. The total value of the silver thus obtained in the year in question was estimated at £88,296 19s. 6d. In the same year the gold found in British mines weighed 702 ozs. 16 dwts. 8 grs., and was estimated to be of the value of £2,848 15s. 2d. Nearly the whole of this British gold—a fraction over 697 ozs.—was procured in Wales, in the Clogau mine in Merionethshire. The balance of 5 ozs. and a fraction was found near Wicklow, in Ireland, in 86½ lbs. of ore. Of silver ore, about 94½ tons were found in Cornwall in the Huel, Prince of Wales, and Redmoor mines, which yielded silver to the value of £5,994 11s. 10d. The richest argentiferous lead ores are found in the Isle of Man, where the 3,920 tons of lead ore procured from the nine Manx mines yielded in 1878 as much as 110,496 ozs. of pure silver. In Wales, which possessed 97 lead mines in 11 counties, the silver won in 1878 weighed 148,376 ozs. England, with 266 lead mines in 10 counties, produced 118,629 ozs. of pure silver in the same year, while 14,320 ozs. were got from the lead ores produced in Scotland, and 5,650 ozs. from those of Ireland. The quantity of British silver produced in the year was rather more than 11 tons,

A New Form of Roasting Furnace.

A new furnace has just been completed at the Union Iron Works, for the Columbia mine, near Tuscarora, Nevada, which is of peculiar construction and operation. It was invented by Miles B. Dodge, the patentee of the Dodge crusher. It is a rotary furnace, but instead of being cylindrical has angulated sides, being hexagonal in form. Each of the sides is slightly rounded, but only sufficiently so to form arch enough to hold the brick lining in place properly.

A dust chamber is formed at the outer end of the furnace connecting with the stack, and on top of this chamber is a hopper connecting with a curved pipe leading through to the furnace. When the furnace is to be used for continuous work on light ores the ore is fed through this hopper and pipe.

At the opposite end is a discharge chamber, and separated from it by a fire-wall is the fire-place which supplies the necessary heat. The discharge opening of the furnace is larger than the feed opening, in order that the ore in the furnace, when being fed continuously, may be discharged automatically without the necessity of any conveyers, inclined flanges or other interior obstructions to the free action of the ore.

On the sides of the furnace are the charging and discharging doors, which are used when it is run by charges. In continuously operating the ore travels in an opposite direction to the flame and heat.

The rotation of the furnace keeps the ore level, and by having the entering opening smaller than the discharge opening the ore will continually discharge, since the constant addition of ore keeps the mass enough above the edge of the larger opening to admit of the ore continually passing out of the discharge end. As the rotation keeps the ore level at all times, it must necessarily pass out of the larger opening. The furnace can, therefore, be made without having to be set on an incline, and without conveyors or screw flanges to pass the ore through.

Those furnaces having ribs, carriers, conveyors or other flanges which raise the ore up and shower it down through the flame, are open to the objection that the draft carries off quantities of ore in dust, only a certain proportion of which is lodged in the dust chambers. Trouble is involved also in repeated cleanings of the dust chambers. Smooth cylindrical revolving furnaces, with no projections, such as are made to obviate the difficulty above mentioned, are objectionable in another sense. The ore is apt to stick together by sliding in mass as the cylinder is revolved, and is not sufficiently agitated or stirred up, and none of the particles have time enough at any one period to become thoroughly oxidized or desulphurized. To accomplish the object, therefore, the ore must be kept in the furnace during a lengthened period.

It is to overcome these objections that Mr. Dodge makes his new furnace many-sided, instead of cylindrical. As the furnace revolves, the ore resting on the rising side remains stationary, being held there by the corner formed by the junction of the sides. At a certain point, however, the whole mass on that side drops down and is completely turned over and stirred up in so doing. The outer surface of this body then remains in contact with the heat and flame during the time the side which is carrying it is raised up as the furnace rotates, when another sudden fall of ore takes place and the operation is repeated.

It will be noticed that this turning over of the ore will take place below or at one side of the line of draft. The line of greatest draft is between the centers of the feed and discharge openings, and when ore is showered down as in other furnaces across this draft, loss ensues by the dust being carried off.

For ore requiring a very long roasting for desulphurization, this furnace is worked by charges, as is intended to be done by the furnace which has just been built at the Union Iron Works. The ore is then charged into one of the side doors instead of through the hopper, and after being thoroughly roasted, is discharged through the same or a corresponding door. In this furnace, in which the ore is to be worked in charges, the brick lining is so put in that the ore circulates from end to end without showering. It therefore chloridizes very evenly.

The furnace is revolved by peculiar gearing. The bands encircling the furnace rest on oppositely placed pairs of grooved rollers. The shafts of one pair of these rollers are extended past the bearings, and on their ends are pinions, between which is placed a gear wheel. On the opposite end of the shaft carrying this gear is a crown wheel, and this being revolved, the center gear rotates the pinions both in the same direction, thus moving the rollers in the same direction and rotating the cylinder, applying the power on both sides.

It is sometimes necessary to run faster than at others. When continuously working, a slow speed is maintained, but when by charge it may be rotated more rapidly when it is desired to throw the charge out quickly. The gearing is so arranged to alter the speed at will without altering the speed of the driving engine. The furnace to which we refer is the largest one of this class of revolving furnaces we have seen, and is designed to work seven tons of ore at a charge. It is 7 feet in diameter and 16 feet long.

Is the Comstock Dead; or Where do Mineral Deposits End?

Radical Changes Demanded—Suggestions and Results.

[Written for the PRESS.]

As one who knew the Comstock in its beginning, and received his first impressions of its value from surface indications—there being no opening on the whole line over 25 feet in depth when I first examined it—naturally its progress by development, its ups and downs, have ever received from me a due amount of watchfulness, interest and calculation. With all mines there are periods of change for profit and loss, consequent upon rich or poor deposits of metal. The Comstock has had depressing periods before the present one, but at this time there seems a crisis, and in the minds of many the question arises: Is the Comstock for profit virtually dead? I will ask, if other mines have for a time universal barrenness, why should not the Comstock? If mines pay above, why should they not pay below? If they have rich deposits at 2,000 feet depth, I want any mining *savant* to give me a scientific or practical reason why they should not have at 5,000 feet depth, —the formation remaining the same below as above. I admit a change of formation may produce a change in the mineral deposit for better or worse. Now, when we stop to think, what is 5,000 feet for depth upon the crust of the earth, which in its thinnest part is estimated to be at least 20 miles in thickness, and from that to 200 miles? Thus we can see how insignificant is the "enormous" depth of 2,500 feet. The writer at one period, and after investing for himself and others over a quarter-million of dollars, saw on the Comstock what was considered by many the bottom of the lode. There was, at this time, considerable of a scare, especially among the owners of the Gold Hill section. A consultation was had by a goodly number of owners, and with their big scare on, several called to see what your humble servant thought of the situation. I had already studied the position of affairs and my mind was fully matured. When the question was asked, "What is the best to do?" my answer was, "Go down, or go up;" and so I now say, "Go down or go up." There is no other alternative; the life or death, practically speaking, of the Comstock, is in the question of depth, and in this development there is the same speculation as to the value of undeveloped mineral deposits as there was above. To accept the ideas of the justly celebrated Dr. C. T. Jackson, of Boston, whom I had the pleasure of accompanying, in his examination of the Ophir many years ago, and who, in speaking of the lode giving out, remarked: "How can there be so much above and nothing below? It is hardly probable that the lode was formed above and had to grow down. *It was formed below, and came up!*" This doctrine is as good for 5,000 feet as for 2,000, so that going down is simply a question of temperature, ore and pay. Science and mechanics can overcome the rest. The Doctor was a believer—at that time at least—in the igneous theory for the formation of lodes; but whether this theory is correct or not, I will not argue at this time.

Because the silver mines of Mexico, or other parts of the world, have not been worked below 2,500 or 2,800 feet, is that any sign that metal is not to be obtained below these levels? Had Mexico, when these deep mines were abandoned, the great mining appliances of to-day, they would have continued as will the Comstock; in fact, many of these mines are now being reopened. The great wonder is they went so deep with the crude way they had of mining.

So much for the question of depth and possibilities of ore deposits. The matter of handling and reducing the ore from these greater depths is the next question for consideration; and right here I wish to say that I am not writing this in the interest of any individual or company; I am simply giving my views; they may be right, and they may be wrong; others must judge. These views may be hurtful to some and beneficial to others, so they may think; I know not of that. Now, considering the present, 1st, excessive depth; 2d, the high temperature of the lower levels; 3d, the grade of ore; 4th, the excessive expenses of running the mines. These all considered make the present a critical period for the Comstock, and it seems to me that it is a time when extraordinary changes should not only be talked of, but should be at once entered upon, as, when made, then would the cloud lift that now overhangs all the companies engaged thereon. Now comes the question, what do I call extraordinary changes. I wish to say again we are considering profitable mining, not interests of mills or mill-owners on the line; simply profit and loss of mining, and to that end I would say, 1st. Let all the companies accept the Sutro tunnel as the salvation of the Comstock, and from one end of the line to the other extend to it their capital, enterprise and influence. 2d. On the line from Utah to Overman, I would form two companies; (1), the North Comstock, which would embrace the Savage, Gould & Curry, Best & Belcher, Con. Virginia, California, Ophir, Mexican, Union Con. and Sierra Nevada, embracing a line north of where the tunnel intersects the lode of 8,598 feet; (2), the South Comstock, which would embrace Hale & Norcross, Potosi, Chollar, Bullion, Exchequer, Alpha, Con. Imperial, Challenge, Confidence, Yellow Jacket, Kentuck, Crown Point, Belcher, Seg. Belcher and Overman, all aggregating in length 8,130 feet, about the same as the north section. Just imagine what would be the saving in the matter of management alone, when we consider the expense attending each of these companies as enumerated, of which there are nine on the north and fifteen on the south. This item alone is worth compiling. This consolidation agreed upon, and the lateral tunnels of Sutro completed of a size as now set (8x8), or larger, and capable of a double-track, narrow-gauge railroad, the next move should be to introduce water power on the level of Sutro tunnel, and for operating both above and below, and thus do away with another enormous expense. Some may say there is not water enough to be had for power. Lake Tahoe can supply enough, and what would it be for such companies to bring in the required quantity? This water could be conducted down the various shafts, giving a pressure from 1,600 to 1,900 feet. Let us see what power this would give by the use of the Knight pressure wheel:

50 ins of water,	1,600 ft	pressure,	will give	160	horse	power
100 "	"	"	"	"	330	"	"
200 "	"	"	"	"	700	"	"
50 "	"	1,900	"	"	193	"	"
100 "	"	"	"	"	454	"	"
200 "	"	"	"	"	831	"	"

It will thus be seen what a great work a comparatively small amount of inexpensive water is capable of performing, and does it not seem as though the great saving in this direction would engage immediate attention?

In this connection I will add that all the water of the mines, from surface to within 100 feet or so of the Sutro tunnel, can be utilized and made to play an important part in the economical handling of waste or ore.

Besides the enormous saving, as between steam above and water power below, the water would operate in cooling the atmosphere of the lower levels and tunnel, as it moved on and out to do another great service, as a cheap power, for reducing the ore. In the matter of water for power, it may be argued that at stated distances you would have to sink shafts to introduce water. I will answer this by saying, there are shafts enough already, and if not, power could be transmitted the whole or any part of the line. There is nothing in this but what can be mastered in this mechanical age.

These suggestions I do not claim to be wholly new; they will at all times suggest themselves to the practical miner; but they may be impracticable to carry out on account of opposition from those not directly interested in paying assessments. Who, thus directly interested, will say that the programme is not correct? This plan would form three great companies—first, the Sutro Tunnel Transporting Company; second, the North Comstock Consolidated Company; third, the South Comstock Consolidated Company. And who would not prefer to invest in Comstock shares under such an organization? Would not the mining world have more confidence in its future than it has had in the past, The fact is, this programme in full operation, the era of profitable mining on the Comstock will have only began. And here I venture to say (ore bodies below being the same as above) that ore could be extracted and put into bullion at one-half it has cost from the beginning to the present time, so that profitable mining, as regards present depths, is no question at all, provided the Comstock companies at once start in for the adjustment of conditions, or to do that which they know is simply a common sense business proposition. Some may say this programme would be too extended an operation. Would its management equal that required by our railroad enterprises? It only wants consummation, and we need go no farther than the Comstock to find men of business calculation, order and capacity to grasp and to successfully work up so extended, if you please, an enterprise.

And here let me say, there is no time more propitious than the present to inaugurate the scheme. How it could be done, I have my views, which are not important at this time to present. Of the past or even present management of the Comstock, as all companies have been and are now necessitated to work, there is more or less unjust complaint. You cannot run enormous machinery and work at great depths on air. It takes money, and if money does not come out of the mine, it must come out of the shareholders' pockets. When it comes to the management of Mackey and Fair, to my mind, no two could, or would have done better. They have shown a dash, a daring, a capacity and a fidelity unequaled in mining anywhere, and if they have stored up great wealth, they have got no more than their enterprise, boldness and industry entitles them to.

Now comes the question, How would such a change as I here present affect Virginia and Gold Hill? I argue that what they would lose one way they gain in another. If some extended radical change at economical working is not made, the Comstock will have only a lingering existence until it drops out of favor entirely, and with it goes both of these prominent localities. With a thorough system as here proposed for cheaply working the mines, the future twenty years looms up greater than the past, and with it is stability and prosperity for both places. What they may lose in milling ores they will gain in the greater underground population, who would always come to the surface rather than travel three to ten times the distance to daylight through the Sutro tunnel.

The great question in the minds of shareholders now is, what will be done to relieve them of continued heavy assessment which they have got tired of, and which, unless some great radical change is made, they will stop paying, considering future profit under the present system hopeless. That this radical change should be made common business sense demands. The interest of stockholders, large and small alike, demand it. The great mining interest of the State of Nevada—yes, of the whole Pacific coast—trade, commerce and manufactures demand it, as profit to the Comstock holders is profit and good cheer for all. Will it be done?

ALMARIN B. PAUL.

December, 1879.

Rainfall Table.

The following very useful table of rainfall at Sacramento has generally been taken as representative for the whole State, since at no other point, except of late years, have such full statistics been preserved. The work commenced by the late Dr. Logan is now ably continued by Dr. F. W. Hatch. The table explains itself, and the figures are brought down to the 14th of this month:

RAIN TABLE FOR SACRAMENTO.—PREPARED BY THE LATE DR. T. M. LOGAN AND DR. F. W. HATCH.

Arranged according to the seasons, showing the amount in inches of each month, during thirty years, and for each rainy season, to December 14th, 1879; also the quantity for every and the annual amount of rain.

MONTHS.	1849	1850	1851	1852	1853	1854	1855	1856	1857	1858	1859	1860	1861	1862	1863	1864	1865	1866	1867	1868	1869	1870	1871	1872	1873	1874	1875	1876	1877	1878	1879	1880
September	0.250	0.000	1.000	0.003	0.000	sp'kle	sp'kle	sp'kle	0.000	sp'kle	0.025	0.083	0.000	0.000	0.000	0.004	0.080	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.000	0.005	0.000	sp'kle	0.000	0.290	.....	8 79'
October	1.500	0.000	0.180	0.000	0.005	1.010	0.000	0.195	0.655	3.010	0.000	0.914	sp'kle	0.000	0.120	0.120	0.480	0.001	0.000	0.000	2.120	0.020	0.210	0.220	0.310	0.690	0.385	0.440	3.320	0.763	.....	
November	2.250	sp'kle	2.140	6.000	1.600	0.658	0.750	0.651	2.406	0.147	6.485	0.181	2.170	0.005	1.430	6.718	7.867	0.364	2.427	3.808	0.774	0.860	0.684	1.220	1.930	1.210	3.801	6.205	0.320	1.120	0.415	1.700
December	12.500	sp'kle	7.070	13.410	1.540	1.150	2.000	2.396	6.632	4.239	1.834	4.282	8.637	2.327	1.815	7.867	0.364	9.511	12.850	2.612	1.923	0.971	10.990	5.388	10.009	0.440	5.525	0.000	1.227	0.476	1.686	
Total	36.000	4.710	17.390	35.355	30.065	18.620	13.770	10.443	18.991	16.041	22.026	15.548	35.549	11.679	7.898	22.512	17.924	25.305	32.769	16.844	13.072	8.470	24.062	14.938	22.898	23.547	25.671	9.325	21.249	16.772	4.043	
MONTHS.	1850	1851	1852	1853	1854	1855	1856	1857	1858	1859	1860	1861	1862	1863	1864	1865	1866	1867	1868	1869	1870	1871	1872	1873	1874	1875	1876	1877	1878	1879	1880	
January	4.500	0.850	0.650	3.000	3.250	2.670	4.919	1.375	2.444	0.954	2.310	2.668	15.036	1.733	1.077	4.776	7.039	3.440	6.036	4.790	1.371	2.075	4.040	1.230	5.200	8.705	4.790	2.770	7.475	3.769	.....	
February	0.500	0.350	0.120	2.000	8.500	3.460	0.692	4.801	2.461	3.906	0.931	2.930	4.260	2.761	0.186	0.722	2.010	7.104	3.147	3.630	3.236	1.919	4.740	4.360	1.895	5.560	3.050	1.400	6.229	3.240	.....	
March	10.600	1.880	5.480	7.000	3.250	4.200	1.403	0.675	2.878	1.637	5.110	3.320	2.800	2.360	1.303	0.481	2.018	1.010	4.348	2.942	1.642	0.690	1.935	0.651	3.050	0.800	4.160	0.560	3.223	4.377	.....	
April	4.250	1.140	0.190	3.500	1.500	4.320	2.132	sp'kle	1.214	0.931	2.874	0.475	0.821	1.633	1.030	1.370	0.475	1.805	2.305	2.120	2.240	2.120	1.454	0.610	0.612	0.890	0.002	1.090	0.185	1.126	2.372	.....
May	0.250	0.680	0.300	1.450	0.210	1.150	1.841	sp'kle	0.203	1.037	2.491	0.590	1.808	0.355	0.742	0.460	2.252	0.008	0.270	0.648	0.270	0.756	0.280	0.000	0.370	0.040	0.190	0.640	0.180	1.318	.....	
June	0.000	0.000	0.000	0.001	0.310	0.010	1.033	0.360	0.098	0.000	0.017	0.135	0.011	0.000	0.037	0.000	0.100	0.008	sp'kle	0.002	0.000	0.001	0.095	0.000	0.002	0.002	1.100	0.000	0.200	0.000	.130	.....
July	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.549	0.000	0.000	0.000	0.000	0.004	0.018	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.001	0.000	0.210	0.000	0.000	sp'kle	.....	
August	0.000	0.000	0.000	0.000	0.000	0.000	sp'kle	sp'kle	0.000	0.000	0.000	0.000	0.005	0.000	0.095	0.000	0.000	0.000	0.000	0.000	0.001	.....	.....	0.000	sp'kle	0.000	0.020	0.000	0.000	sp'kle	.....	

THE *Contra Costa Gazette* reports that S. B. Martin has sold his Santa Rita Rancho property in the Amador valley, comprising some 16,000 or 18,000 acres, at the rate of $90 an acre.

Immigration to California.

There is no doubt that California is one of the best countries under the sun for the immigrant. Its genial climate recommends it equally to the native of the tropics as to him of the temperate zones. The former can find in the southern part of the State a habitat suited to him—the latter can live with comfort, so far as temperature is concerned, over the greater part of the whole State. The soil is equally suitable to the products of the tropics or the temperate zones. The vine, the fig, the olive, cereals of all kinds, silk, sugar, rice and cotton can be grown in one portion or other of its wide domains—some of the staples in all of it. Access by rail and steamer can be had to nearly all the desirable portions of the State. Its riches in gold, silver and other minerals are well known. The latter it was which originally drew the stream of Caucasian immigration to this coast; otherwise we are too far out of the beaten track to receive the immigration that we should and ought. The Mississippi Valley will not be fully settled for half a century to come, and the people of the Eastern States wish to take up the unoccupied lands of Kansas, Nebraska, Minnesota, Wisconsin and other States, inasmuch as they are nearer and as their friends and neighbors have preceded them to those sections. European immigrants come to New York, Philadelphia, etc., as more easily accessible, and those of them who want to go west seek the prairie and trans-Mississippi States, so that our great national attractions are in this manner offset. Now, immigration is the life-blood of a new country. So conscious were the men who organized the revolution of the last century of this, that one of their plaints against King George was that he had placed obstacles in the way of the naturalization of foreigners. Since that clause was written the cause of independence triumphed, and the results of a century of immigration and naturalizations of these foreigners are before us. And what are they? Ten millions of men and women, in the prime of health, life and enterprise, added to the population; a vigorous offspring of twice the number—forty-five millions of people from four millions, and a country devastated and impoverished by war to one with a wealth of forty-five thousand millions of dollars. California has the largest area of any State outside of Texas and is larger than either Great Britain and Ireland, or Italy, both of which have populations in the neighborhood of thirty millions, while we boast of only one.

We have room for millions yet. It is desirable that we should have them. But our people have been singularly apathetic in the matter. They should wake from that apathy. A few land associations from time to time have done a little in the matter of advertising the resources of the State and the value of the lands that they have had to sell. So far as good, though in matters of this kind the unfortunate immigrant is as liable sometimes to be taken in as was Martin Chuzzlewit when a land speculator sent him and his friend to find an Eden among the fever and ague breeding swamps of the Mississippi, and where the only variation of life's *ennui* was from burning to shivering and vice versa. We have, however, no such fever breeding lands in California, but it is as well to beware of the land speculator all the same.

The other evening a meeting of very respectable gentlemen was held in the parlors of the Baldwin, to do something to encourage immigration. An organization was perfectly effected, out of which it is to be hoped something practical in this direction may be accomplished.

It is adviseble that agencies should be established in all the leading cities of Europe and America, giving information as to location of lands, etc., and how to reach them; such information as could not be otherwise obtained, and as would suffice to turn the tide Californiaward. A bonus should be given to those vessels that would introduce the greatest number of immigrants. Lines might be laid on from Europe and the East by which immigrants could reach these shores at comparatively low figures. We have always from three to five hundred vessels seeking this coast for wheat freights from all parts of the world—principally from Great Britain, Australia and the East. They could easily be fitted out for passengers, whom they could carry at small cost.

The general Government should be urged to complete the survey of our forty millions of acres of unoccupied lands, so that an immigrant might know where to go, to pre-empt, or to select from. With these and such other arrangements as should recommend themselves it would not be long before we had a quite a large stream of immigration to this State. But not one cent should be devoted by the State to promoting individual schemes.

WE hear, says the Colton *Semi-Tropic*, of some excellent finds of silver and copper ore in the mountains north of Frink's Spring, about 100 miles east of here.

Refining of Gold and Silver Amalgam.

[Written for the PRESS by E. N. RIOTTE.]

At a time when silver rates so low, and when especially there is so great a difference between the rates of discount on "low bars" and "fine bars," any contribution to our knowledge of how to make *fine bars* from *low grade amalgam* must necessarily interest the "milling public."

The following is the result of practical working on a large scale at the Auburn mill, near Reno, in 1874-75. Many crudities with which I then battled have been eliminated since by my experiments, and I do say that the process can now be carried out, even more successfully, both financially and chemically. What are the advantages of a simple, a cheap refining method for amalgam? Let us consider a mill producing silver of low fineness. There will be:

1. A saving in freight. Instead of shipping lead and copper at silver rates, it will enable us to ship nearly pure silver.

2. We would have much less retorting to do. Besides, the retorting of fine silver amalgam can be done faster and more perfectly than the retorting of base bullion amalgam. Especially if the base be lead, the retorting is very slow and imperfect, the lead retaining quicksilver even after melting.

3. In many cases we might have a greater percental yield of silver from the ore. It is a well-known fact to mill men that a greater yield is obtained by producing base bullion, but the consideration of "discount," etc., always makes him strive to produce fine bullion; finally the

4. And chief consideration, is the saving in "discount." The following are the prices ruling just now, as obtained from the chief bullion purchaser:

Average Prices of Bullion.

500 fine base lead, antimony and copper	15%	to	20% dis.
500 fine base lead	15%	to	17% dis.
500 fine base copper	15%	to	15½% dis.
750 fine base lead, antimony and copper	15½%	to	16½% dis.
750 fine base lead	14%	to	15% dis.
750 fine base copper	13½%	to	14% dis.
990 fine	11½%	to	12½% dis.

Having thus made the large margin to the "refiner at the mill" so very apparent, I need not further enlarge upon the advantage to be derived, but will proceed to show how the refining can be done.

Chemical Principles Envolved.

It had been known for a long time that when quicksilver becomes "fouled" by lead or copper, a slight shaking with bluestone and salt would thoroughly free it from these metals. Now, why not apply this same trick to amalgam? And, lo! the child was born!

Bluestone, $CuOSO_3 + 5HO$, and common salt, Na Cl, mixed in proper proportions will form copper chloride, Cu Cl (besides other compounds just now of no interest to us.)

This Cu Cl, very easily in cold or warm, thick or thin solution, takes up one more atom of copper or lead when brought in contact with either metal, forming sub-chloride (R_2 Cl) or proto-chloride, in either case a whitish compound insoluble in water. It is true Cu Cl will also attack quicksilver and silver, changing them to chloride; but these metals are quickly reduced again to a metallic state, by a surplus of copper or lead.

All that is necessary to try the experiment is to take a quantity of base amalgam in a bottle, shake for some time with bluestone and salt, then wash out the grayish white insoluble sub-chloride (R_2 Cl), and nothing but quicksilver and silver will be left.

Which is now the best way to apply these principles practically to the refining of amalgam on a grand scale?

In the following I will give "my way" as executed at Reno. At the same time I would say that perhaps other ways and other apparatus will do as well.

Apparatus Needed.

1st. I have a common Freiberg barrel, run by pinion and cogs on friction gearing, so as to revolve about 18 to 20 times per minute. To refine one ton of amalgam, the barrel should be five feet by four feet in diameter, and made of three-inch pine staves, with a four-inch hole for a wooden bung. This barrel runs in a trough connected by a wooden conveyer.

2d. A deep settler also entirely of wood, with a tight-fitting cover. This settler is to be five feet in diameter, and five to six feet deep, with a solid wooden muller, geared to run 12 to 15 revolutions per minute.

3d. Large wooden vats to settle the wash water running from the settler.

Management of the Process.

We will now take a ton of amalgam, sample it thoroughly, and place it into the barrel, adding 500 to 600 lbs. more of quicksilver, so that it may be thoroughly thinned out. The sample we quickly test as to its percental amount of Cu and Pb, and finding by Stochiometrical calculation, that 100 lbs. CuO SO_3 + 5 lbs. O will make 53 lbs. Cu Cl, and that consequently 2.12 lbs. Cu Cl will take up 1 lb. Cu; 1.3 lbs. Cu Cl will take up 1 lb. Pb., I add enough bluestone to take up all the Cu and Pb, adding at the same time salt a plenty without further calculation.

Twenty or thirty cobble stones are put into the barrel, and enough wet pulp is added to make a thick paste, and the barrel started revolving about 20 revolutions. After running a few minutes I stop to see that the temperature of the pulp is correct. A stick thrust in must bring up plenty of pulp, it must not drip thin from the same. Neither must it be so dry as not to adhere to the stick.

Now, start the barrel and run for an hour and vent; take a sample, and by straining the quicksilver, see how far the operation has progressed. If the quicksilver is coated with a dark skin, considerable time is still needed. If the skin is bluish-white it is near the finish; if entirely bright and clear it is finished, If run too long, (*i. e.*, beyond the finish) the quicksilver will cut and settle very slowly. The process is not difficult to learn, a short experience gives you the exact time when to stop the barrel.

Just before the finishing point would have been reached, stop the barrel, and fill up with water, and again start the barrel, but this time only with 8 or 10 revolutions. This will allow the amalgam and quicksilver to collect and gather.

After half an hour's traveling stop and sample. Generally the charge is ready to discharge into the settler. If so, draw the bung, put in a wooden grate, so as to retain the cobbles, and turn the barrel hung down. Start the settler, hose out the barrel and conveyer rapidly (if possible with boiled water, as this will prevent any chloride forming—however, this is not necessary), leaving the upper hung in the settler open, but the cover closed down tight.

I especially counsel that discharges and cleaning of the barrel should be done as rapidly as possible, as I found that the subchlorides (R_2 Cl), on exposure to the air, immediately oxidize higher, forming oxychlorides (R O + R Cl) and soluble chlorides (R Cl), and that this newly-found chloride (R Cl) will immediately attack the quicksilver, forming calomel, thus occasioning losses of quicksilver.

A continual stream of water is allowed to enter the settler (the washings are caught in tanks and allowed to settle), and the amalgam finally taken out by syphon and strained, etc. The settlings from the tanks are allowed to drain, shoveled by means of wood or copper shovels upon a platform (best of asphalt), moistened at intervals with very diluted sulphuric acid, when the copper can be gradually leached out as Cu Cl copper chloride, the same material with which we began. Thus, if our base was copper, we will soon have more Cu Cl than we need and copper for sale.

The residue may be rich in quicksilver, and can be added to the pans with advantage during the extracting of silver from ore, when all quicksilver will also be regained.

At the point above where we added pulp, a departure can be made. It is not necessary to add the pulp. The process is only very much shortened by this addition, or by the use of roasted copper ores. In case we have used no pulp, our residue will consist only of subchlorides. The copper can be extracted as before described, and the balance, being very small, can be restored when enough has accumulated, and the chloridized quicksilver thus regained.

The loss of silver is very small, never amounting to over ½%, and the most of this is recoverable, if the leached residue be added to the ore in the pans.

Instead of bluestone, where sulphureted copper ore is cheap, this can be roasted and used as indicated above, after having determined the amount of Cu Cl that will be formed by boiling the roasted ore with salt. I used this method very successfully at Reno.

Some other improvements in the process, that will cheapen and simplify the same, and upon which I am experimenting, I will describe in some future number of this paper. Giving the readers the figures of

An Average Charge

At Reno, I will close.

2,100 lbs. strained amalgam containing:—
365 lbs. of Cu+Pb+Ag (Ag would have been 560 fine).
205 lbs. Ag.
160 lbs. Cu+Pb.
87 lbs. Cu.
73 lbs. Pb.

Cost.

368 lbs bluestone	@10c	=$36.80	to extract the copper.
176 lbs "	@ 10c	= 17.60	" the lead.
200 lbs salt	@ 1c.	= 2.00	to finish the chlorine.
One man	@$5 p.d.	= 5.00	
Loss of Hg 6 lbs	@4.50	= 9 00	
Approximate loss of Ag 2 oz		= 2 60	
Total		$72.00	

Yield was two bars weighing 3,010 ounces 988-99 fine, valued at $3,846.78 (showing an apparent loss of about $40 in refining, but which was brought down to about two ounces by slags, clips and other allowances.)

Our discount on 560 fine bars ranged from 12% to 14%, and on 990 fine bars the discount ranged from 8% to 9%.

In the extreme cases (8% to 14%) the saving in discount amounted to $157 ($230—$73), in the other extreme (9% to 12%) the saving amounted to but $33 ($105—$73.)

But I would again point out that I have placed the cost at its full value, if bluestone is bought as such. By transforming the Cu^2 Cl to Cu Cl at the expense of the oxygen in the ore and sulphuric acid, the cost will be reduced more than a fourth.

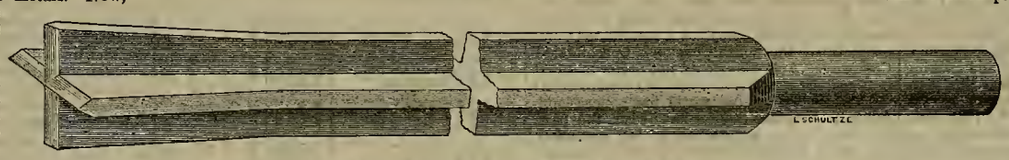
Grooved Steel for Drills.

We show on this page engravings representing Sanderson's grooved drill steel for power drills. As will be seen from cuts above showing section of bar and drill, this steel is made in bars of the required shape for working end of what are commonly termed Burleigh drills. Heretofore this shape has been worked out from the octagon bars by hand labor, at a large expense, which, as will be readily seen from above cuts, is almost entirely saved by the use of this steel, the drills made from it being as readily and cheaply sharpened as hand drills made from octagon.

It is one-third lighter, though stiffer, than same size in octagon, and costs less per drill, though a small advance in price per pound is charged. It is easier handled in the mine, from its less weight; and the grooved form is found to clear the hole from debris better than the octagon.

This steel is now being used in several of the largest mines on the Comstock with great satisfaction, and has the unqualified approval of Mr. W. H. Patton and other mining Superintendents. In fact the advantages attending the use of this steel are so great and decided, particularly as to saving in cost of making and sharpening the drills, which amounts to fully 75 % as compared with cost of drills made from octagon shape, that no mining company using power drills, can afford to continue the use of octagon steel. This steel will in all probability rapidly supersede the octagon in all such mines, there can be no question.

SECTION OF BAR.



POWER DRILL FROM GROOVED STEEL.

The following sizes, viz., one inch, one and one-fourth inch, one and one-half inch answering respectively for one and one-fourth inch, one and one-half inch, one and three-fourth inch drills, are found to cover practically the full range of use needed. Where larger than one and three-fourth drills are required, they are readily made from the one and one-half steel, by a little extra upsetting. A full line of this steel now for sale at the Sanderson's Steel Agency, 21 and 23 Fremont street, San Francisco, H. D. Morris, Sole Agent.

"NO TIME TO READ THE PAPER."—We occasionally hear of persons who state that they have "no time to read the paper." They might as well admit that they have no time to attend to their business. The manufacturer or merchant who neglects his daily paper does not know what the world is doing, and he who omits the perusal of his trade journal misses scores of seasonable and useful hints; is ignorant of what his home and foreign competitors are bringing out; takes no note of circumstances which, of no special moment in themselves, show which way the wind of commerce is blowing from time to time—and, in short, he overlooks a most important section of his business. The fact is, the man who means to be successful in business must read his paper, and must regard it as one of *the* features of the week. Without it he is kept in ignorance of what other firms are doing; is not posted up on all the changes of prices; has little intelligence from abroad, and that purely from his own agents' point of view; and only hears of his competitors' novelties when they have gained the market over his head. Pretty much the same set of remarks applies to the retailer, who, in neglecting his paper throws away every possible chance he has of buying to the best advantage and meeting the requirements of the public. Every trader *must* read his paper if he desires to be successful and make money. Next to his Bible should come his "trade organ"; with the two combined he need have little fears of the ups and downs of life and the whips and scorns of capricious fortune.—*Ironmonger.*

Tombstone District, Arizona.

EDITORS PRESS:—It was Solomon, I believe, who said, "there was nothing new under the sun." He certainly could have had no intention of including a mining district in his wise saying, and certainly not Tombstone district. There is something new every day here—new in the line of new discoveries and new strikes in the old mines. The Contention mine, for instance, quite recently astonishes everybody with a rich find of large bodies of chlorides in the lower workings, rich in silver and rich in gold, some of the specimens being literally covered with specks of gold.

But to drop from generalities and be more in detail, I will speak first of

Milling Facilities.

There is now one 10-stamp mill in operation, and two 20-stamp mills nearly completed, and a third and perhaps a fourth soon to follow.

The Tough Nut mine, located adjoining this town, is owned by a New England company, known as the Tombstone Mine and Mill Co. They have a 10-stamp water mill on the San Pedro river at Charleston, nine miles distant from the mine, that has now been in operation about five months. The first three months it was a dry crusher and turned out bullion at the rate of about $60,000 per month. It has since been changed to a wet crusher, and now its yield is said to be, in round numbers, $100,000 per month.

The Lucky Cuss mine, located about half a mile from the Tough Nut is also owned by a New England company, who are also erecting a mill (20-stamps, steam power) at Charleston, adjoining the Tough Nut mill. This mill will be in operation in about one month.

The Contention mine, owned by a California company, are putting up a 20-stamp mill on the San Pedro river, at a place called Contention City, 10 miles from the mine, which is located about one mile east of Tombstone.

The Empire mine, which also adjoins the town of Tombstone, was recently sold to a Boston company, who propose at once to put up a mill at Charleston. The Naumkeag mine, which adjoins the Contention, was recently sold to a California company, who also propose to put up a mill.

I do not intend to be enthusiastic over this country, but still will say that I believe there is no country on the top of this earth, of equal extent, that contains as many valuable mines and as much precious metal as can be found within a circle of 100 miles in diameter with Tombstone for the center.

Giving you a little geography of country, I will say that the Patagonia mines lie about 50 miles to the southwest; the Huachuca Mountain mines about 30 to 35 miles west of south; the Mule Mountain mines from 20 to 35 miles to the southeast; the Dragoon Mountain mines about 15 to 25 miles to the northeast; the Limestone Mountain mines about 15 miles to the north; the Chiricahua Mountain mines from 35 to 40 miles south of east; the Doe Cahezas gold and silver mines 40 miles to the east, and the Arivaypa mines about 45 miles to the northeast. So you see we are surrounded by mines on all sides, the richest and most extensive in volume of rich ores being those that lie in the Tombstone mountains surrounding this place. New strikes of rich milling ores have recently been made in the San Jose mountains, just over the line, on the Sonora side. The future of this country is not known, but this is apparent to me that I have never before known a new mining country open up with such a bright beginning.

Tombstone town, or rather city, is already a place of more than 50 permanent residents, with all the miners from the adjacent mines to spend their nights, Sundays and money in the town. There are no less than 30 saloons already in full blast, at least a dozen stores, two lines of six-horse coaches running daily from Tucson; all lines of trades and professions, among them no less than eight resident lawyers; and what gives the strongest evidence of rush and prosperity is the two burdy-gurdy dance houses nightly filled, the keno games, besides a dozen or so other places where all kinds of gambling is openly carried on. * *

EDISON AND THE MINES.—The Oroville *Mercury* says: Major Frank McLaughlin telegraphed to us from Menlo Park, New Jersey, as follows: "Edison Ore and Milling Company is organized. Prominent New York parties back the scheme. Process for working tailings entirely new and Edisonian. All well." If anything were wanting to convince our readers that Edison intends to save the gold at present going to waste in the hydraulic mines of this section, the purport of the quoted dispatch undoubtedly removes the want. Very few of our reader appear to realize what an important item these works will be in the future prosperity of our city. None but the miners themselves, who have been saving not to exceed 40% of the gold contained in the dirt heretofore worked by them, seem to have the slightest conception of the marvelous results destined to be accomplished by this enterprise. It is a settled fact, however, that the works will be rented and in full blast within two months.

The San Jacinto Tin Mines.

During their recent visit to southern California the publishers of the PRESS took occasion to visit the San Jacinto (Temescal) tin mines. They were reached by a ride of about twenty-five miles westerly from Riverside. These mines are located in the Temescal mountains, which separate the upper from the lower Santa Ana valley. They are about fifty miles east from the city of Los Angeles and thirty-five from Anaheim landing. The existence of tin in workable quantities in the Temescal range has been known for twenty years or more; but the company now owning the property was organized January, 1868, and hold title by purchase of a Mexican grant of about 50,000 acres of land, upon which grant the mines are located. Active operations for opening up and developing the mines were commenced about six months after the company was organized, the most of the work being done upon the "Cajalco vein," which shows the largest ore croppings and the heaviest body of ore of any of the fifty or more distinct veins which are said to have been discovered and located upon this property. The roads to and from the mines are good at all seasons of the year, with water communication only thirty-five miles distant. There is an abundance of wood on the property for smelting purposes and for timber, and convenient water power sufficient for concentrating purposes. Lumber of all required dimensions, for mine, mill or building purposes, can be obtained from San Bernardino at a cost of from $25 to $30 per thousand.

We append herewith a diagram (Fig. 1) showing the boundary lines of the original grant of the Sobrante ranch, of about 50,000 acres, within which will be seen a square location of the tin district, which comprises the property of the San Jacinto Tin Company. It will be seen that the lower or western portion of the lands of the Riverside colony were embraced within this grant. In going to the mines from Riverside we passed through Magnolia avenue, as shown in the diagram, to its crossing of Temescal creek, from which point the road skirts along the western bank of the generally wide canyon through which the creek runs and which is thickly wooded and well watered, affording many sheltered nooks of arable land.

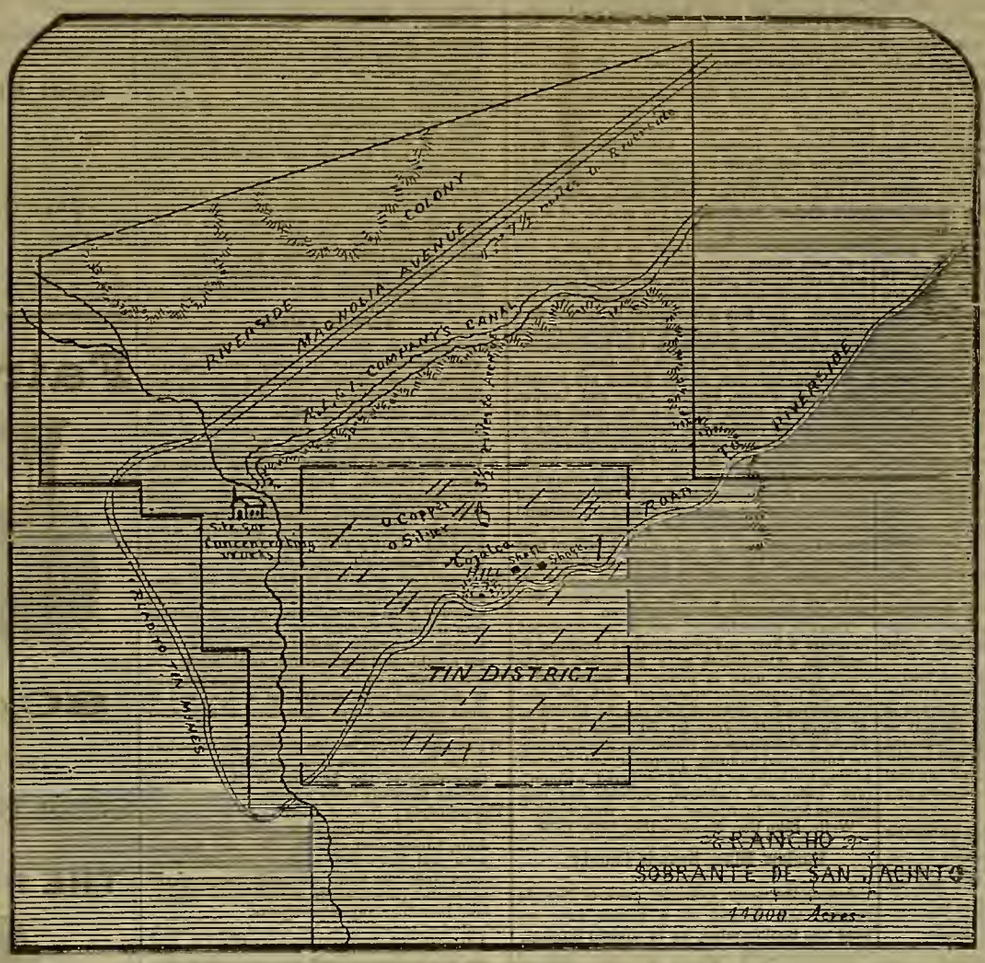


FIG. 1. DIAGRAM OF THE SAN JACINTO TIN MINING DISTRICT.

Concentrating Works.

The point where the Riverside irrigating canal empties into the creek has been selected as the site for the works which must be put up for crushing and concentrating the ores. The site is a most convenient one, with abundance of wood and water upon the spot, and where the supply of wood may be kept up perpetually from the rapid growth which, with a very little care, can be secured in this locality. It is also the very point at which the ore from the Cojalco and several parallel veins can be most conveniently delivered through an adit tunnel, which will strike the veins at a great depth, running in from the eastern bank of the creek canyon. The road, after passing along up the canyon a distance of some three miles, turns suddenly to the left and climbs the high hilly region in which the mines are located. After passing the works upon the Cojalco vein the road continues on to the plains beyond, as indicated, and so back to Riverside. The road to Anaheim landing continues westerly in nearly the same direction as Magnolia avenue, joining that avenue at the crossing of Temescal creek.

Developments in Progress.

Fig. 2 gives a sectional view of the work of development upon the mines. As will be seen two shafts have been sunk 77 and 98 feet in depth. An adit tunnel has been driven in, following the course of the vein from a ravine, as shown in Fig. 2, to a distance, in one direction, of 449 feet, and about 100 feet in the other direction. The first 100-ft level has been opened for a distance of 375 feet, and is connected with the adit level by the main shaft and also by a winze. The hoisting has thus far been done by a horse whim, of which there is one for each shaft. The shafts and tunnel and hoisting works appeared to be all in good condition at the time of our visit, although filled by water up to the drain level. No work has been done upon the mines for some time, the present owners waiting for capital wherewith to commence operations on a scale commensurate with the value and importance of the mine.

A large amount of rock has been raised to the surface—sufficient to show, quite conclusively, the general character of the ore. Several shipments, of several tons each, have been made to this city, and, we believe, also to England, which have been worked with most satisfactory results. Considerable work has been done upon other ledges in the way of sinking pits and shafts to determine the locality and extent of veins. The work upon the mine has been under the supervision of Mr. Williams, a Cornwall tin miner of thirty years' experience, who expresses the fullest confidence in the great value of the property.

The mine was visited and examined some four or five years since by Mr. N. M. Maxwell, an English engineer, and at that time, if not now, manager of the Flagstaff mine in Utah. Mr. Maxwell has spent many years in the tin mines of Cornwall, and is pronounced one of the best practical experts in tin mining who has visited this coast. He made a thorough examination of the mine, which was being worked at the time, and free from water, and reported to the expert of the company that he believed that the mines of this company contained more tin than existed in the whole of Cornwall.

If we can place confidence in the opinion of experts, there is tin enough in these mines to supply the entire demand for that metal in the United States—a supply which is now furnished from abroad at a cost of from twelve to fifteen millions annually. Tin is one of our largest articles of import. Its uses are numerous and vast, and the consumption very great. Why not turn this large balance of trade in our favor? Our capitalists should feel a national pride in the matter, and should be ready to aid with their means and influence in so useful and important an undertaking. The working of these mines on a proper scale would add thousands to the population of this State, and millions to the aggregate of our productive industry.

England has for centuries reaped rich returns from the tin mines of Cornwall, at a cost of working in excess of what would be the cost here, by reason of the low percentage of the ores there, the great depth at which the mines are worked, and the scarcity of wood and water. Ore can be profitably raised there at this time from only the richest of the mines. Travelers through Cornwall inform us that hundreds of tall chimneys may be seen in almost every direction looming up as silent monuments of mines worked out, evidences of busy life long past. That the tin deposits of Cornwall are fast becoming exhausted; that they will continue but a little longer to add their annual contribution to the material wealth of the world, is now very generally conceded.

Other tin districts of the world are worked to about their fullest capacity, and it would seem to be the part of wisdom for California to step in at this time and contribute her share, as she may do, to this important industry.

Comparative Value of Mines.

A tin mine in Cornwall that pays 2% is considered a good property, with, if an extensive one, "millions in it." The Levant mine is worked to a depth below drainage of 1,800 feet, and yet yields an average of only 2½%. The Dolcoth mine, also at a depth of 1,800 feet, yields only 2% ore. Tailings are worked over at that mine that yield only one-quarter of one per cent. of concentrated ore. The Phœnix mine, near Siskeard, one of the best managed mines in Cornwall, is worked at a depth of 1,500 feet, and yields only 1%, and yet the property, depleted as it is, is valued at $1,200,000. When, in contrast with the above, we take the estimates of Cornish experts that the Cojalco mine will yield an average of 5%, what must be the value of the wealth of tin buried in the Temescal hills? We leave it for others to make the figures.

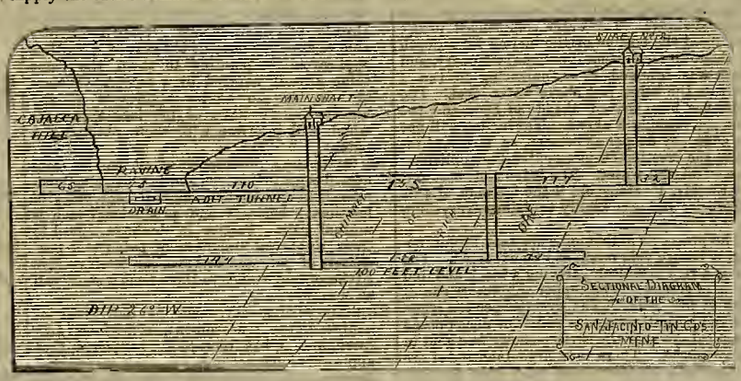


FIG. 2. SECTIONAL VIEW OF THE COJALCO MINE.

Tin Statistics.

Statistics giving the true amounts of the tin production of the world are very difficult to obtain, as nearly all interested in the business strive to keep the particulars of the same as much a secret as possible. Johnson, in his recent encyclopedia, perhaps the best authority at hand, gives the figures for the production of tin in 1871 as follows:

England	11,320 tons.
Banca	4,320 "
Billiton	3,190 "
South America	1,200 "
Other sources	5,000 "
Total	25,030 tons.

The consumption of tin has ever been close upon its annual yield. There is seldom, if ever, any large surplus, and the increasing uses to which it has been applied during the last few years is steadily adding to the annual demand for it.

The process of obtaining tin from the ore is very simple and comparatively inexpensive. The mineral occurs only in two forms—the oxide and as a sulphuret, never native. The oxide occurs in compound octahedrons and square prisms, with various modifications; it is nearly opaque, and gives a pale brown streak. In this form, when pure, it yields 78.38 tin. The sulphuret forms in cubes of a yellowish gray, giving a brown streak, and yielding tin 27%, copper 30%, sulphur 30%, and iron 13%. Tin is almost always associated with copper. The tin mines of Cornwall have in many cases been worked for copper when first opened, the tin coming in generally at about 1,000 feet in depth. The San Jacinto ore is remarkably free from many mineral impurities which greatly trouble the smelters of Cornwall, and as a consequence yield a much purer metal. This fact has been noticed by tin workers who have worked up the small amounts of tin which have from time to time been obtained from these mines.

NATIONS look to the United States for their supplies of food, and yet few people realize the great productiveness of the soil in this country. Some recent statistics showing the quantity and value of our principal agricultural products for the past ten years will therefore interest many of our readers. As prices are low and production large, the yield in money for cereals this year may be less than the average. The average per year—home values—for ten years is given in the following table:

	Bushels.	Value.
Corn	1,068,959,550	$526,211,602
Wheat	273,831,746	301 481,540
Rye	18,016,030	15,091,207
Oats	291,036,670	116,810,591
Barley	30,606,609	25,385,459
Buckwheat	10,938,070	9,204,801
Hay	.....	300,000,000
Cotton	.....	260,000,000
Total	1,692,388,675	$1,553,175,201

Butter products this year will be worth about $170,000,000; cheese and milk, $130,000,000; beef and its products, $270,000,000; pork and its products, $250,000,000. The increase for this year in the production of cereals over the average of the last ten years is estimated at about 28 per cent., and it is thought by some that the aggregate value will not be greater; but taking ruling prices as a basis for calculation, and allowing a margin for lower prices during the remainder of the crop year, we believe that the average value given will be greatly exceeded.—*American Mail and Export Journal.*

ADULTERATION OF LIME JUICE.—It is said that the lime juice sold in London and in Australia has been found so adulterated with sulphuric acid that it is injurious instead of wholesome as lime juice is in its natural state. This adulterated juice purports to be from the South Sea islands. If the exporters thence do not stop such operations there may be a good chance for price enough to make pure California lime juice a profitable product.

LOWER CALIFORNIA MINES.—The San Diego *News* says that the gold mine of Gov. Castrejon, located near San Rafael, is being worked and is yielding well. The character of the vein has not been determined. It may be a pocket or a ledge. The first little division found, yielded $600 in a little while.

COLONEL BROADHEAD, of San Francisco, has bought the Pilgrim mine, in the Sawtooth mountains, Utah, the consideration being $25,000.

Spruce Mountain Mines.

Difficulties Which Have Been Overcome.

EDITORS PRESS:—Permit me, through the medium of your valuable columne (for the benefit of many who have been misled and by miereprecentatione caueed to believe that which was false), to state that six long years ago war was declared against the inhabitante of Spruce mountain by a eet of unprincipled beings, who fortified themselves on the east and on the weet, and opened their batteriee upon us and all others who might by chance exprese a deeire to locate among ue, and by their representations have persuaded nearly all to shun ue and locate eleewhere. Their object in so doing was to cut off our communications aud eupplies, thue leaving us destitute and alone, thinking that in time we would be compelled to abandon all that we held by right of diecovery and posseeeion; that they might without further effort inherit the lands and wealth of others, and then dictate to them terms most unreasonable, and no lees than an unconditional surrender. Such terms were contemplated and frequently made known in public boaste, but such terme have been and will be as frequently rejected with a determination to fight it out on our own line.

The war waxed warm. Skirmiehing in the back grounds hae been of frequent occurrence, and many a poor warrior fainted and fell by the way; hut a few of the surviving bravee who remained to fight the battles of life retreated into the Black Forest of the mountain, and have there successfully defended and protected their poete and monuments, marking the discovery and boundariee of the land which they claim. During those years the men in the camp have amueed and bueied themselvee by developing the mineral wealth that lay within their forest bounds, and are now ready to advance into open field and demand their right to admittance into the great American "mineral boom," on the merits of the once hidden but now developed treasure that liee waiting only the hand and capital of intelligent men to claim its place in the kingdom of coius.

There are in this district thousands of tons of free emelting ore developed that will average 40% lead, and from 40 to 50 ouncee per ton in eilver. Thie ore can readily and cheaply he converted into coin, as shown hy the following itemized estimate in mining, hauling and smelting, neing hut one 30-ton furnace and six coal kilne, which can all he huilt in this camp at a coet not exceeding $15,000, thus:

1. Wood can be bought and delivered at the kilne for a long time at a cost not exceeding $5 per cord.
2. One cord of wood will yield 45 bushele of coal, whicb amounts to 11 cents a hushel. The cost of burning said coal is about 1½ cents per bushel, making total cost of coal 12½ cents per bushel.

3. Twenty-five hushels of coal will emelt one ton of ore, and 750 hushcle will smelt 30 tons of ore, which will, at 12½ cents a bushel, amount to	$93.75
4. Cost of labor, wood, oil, lights, etc., per day, as follows:	
2 engineers @ $4.50	9.00
6 smelters @ $4	24.00
3 feeders @ $4.50	13.50
3 ore crushers @ $3.50	10.50
3 ore wheelere @ $3.50	10.50
3 coal wheelers @ $3	9.00
1 roustabout @ $3	3.00
1 blacksmith @ $5	5.00
1 Superintendent @ $10	10.00
3 cords of wood for engine @ $5	15.00
Oil, lights, etc., @ $5	5.00
Total cost of smelting per day	208.25
Divide $208.25 hy 30 (tons of ore), and you have the cost per ton, which is $6.94.	
5. Cost of mining will not exceed $1.50 per ton and 30 tons will cost	45.00
Hauling ore to furnace at 50 cents per ton	15.00
Total cost of mining, hauling and smelting	$ 268.25
Total cost of mining, hauling and smelting per ton	$8.94
6. Three tons of ore will average a yield of one ton of bullion. Total cost of bullion per ton at furnace	$ 26.82
7. Freight on bullion to R. R., per ton	8.00
Freights by R. R. to N. Y., per ton	40.50
Total cost of bullion per ton in market	$75.32
8. Lead value of hullion in market at 5½c	$110.00
This shows a net profit on lead, per ton of bullion, of	34.78
And a net profit on lead, per ton of ore, of	11.59
9. The silver value contained in each ton of bullion or ore is an additional net profit, which will amount to about $145 per ton of bullion, or about $48.33 per ton of ore	48.33
Making a total net profit, per ton of ore, of	$59.92

I believe the above estimate to be within bounds and reliable, as moet of the above figures upon which the eetimate ie based were obtained from reliable aud experienced men in the bneinees, such as Mr. Franz Jungk, of the Germania Smelting Company, Utah, and Mr. N. R. Remley, of Utah, a man of practical experience in huilding coal kilns and in hurning coal; aleo from expert minere who well know the ease and cheapness with which ore can he mined and delivered at furnace in this district. Taking into coneideration the quality and quantity of ore that has been developed in this camp within the last two years, and the natural facilities for working the mines, reducing the ore and freighting the product to market, I am conecientious in eaying that there ie not a mioing camp in this or any other State or Territory holding as many natural advantages and equal inducemente for capitalists as can be found here at the preeent time; and as soon as any party with eufficient capital, energy and intelligence takes hold of the mines in this camp the name and merit of this dietrict will be sounded abroad. For the benefit of those wisbing to visit and examine the minee in this camp, I will state that thie district (Sprnce Mountain) ie situated 35 miles south of Wells' etatiou, a town on the Central Pacific railroad, in Elko county, Nevada, and is connected with Wells by a tri-weekly stage. "Sprucemont" is a small town eituated on the weet side of Spruce mountain, near which are several good prospecte and minee, namely, the Iroquois, Milo, Evening Star, St. Louis, Eureka, Carry and Great Expectation. The Iroquoie ie now heing worked, and turning out ore that will aeeay from $200 to $400 per ton. The Milo has about 100 tone of good ore on the dump, and ehowe good bodies of ore in the shaft. It is 180 feet deep. The Evening Star has about 50 tons of ore on the dnmp that will assay 50% lead and $60 in silver; the Eureka and Carry have about 100 tone of ore on the dump, and ehow coneiderable more in the mines. Two and a half miles northeaet of town and on the main mountain, are situated the Juniper, Keystone, Killey, Badger, Eva, Havana and Monarch minee. The Juniper ie developed by tunnel, incline, drifts and shafts to a depth of 150 feet. It shows large bodiee of good ore and ie evidently the making of a big mine. The Killey is developed by shaft, tunnels, cut, inclinee and drifts, to a depth of 150 feet, and showe large bodiee of low grade ore and a little good grade ore, and would probably make a good mine if properly managed and developed. The Eva is developed by incline to a depth of 40 feet; it showe a well-defined vein of ore varying from six inchee to two feet in width, and there is about 25 tons on the dump.

One-half mile east of the Killey are located the Black Foreet, Brietol, Cave and London mines. The Black Foreet ie the chief, and is developed by tunnels and inclines to a depth of about 340 feet; it ehows large bodieeof free smelting ore from within 20 feet of the snrface to the loweet level. The amount of ore developed in thie mine is eetimated at about 10,000 tone, and there is six or eeven hundred tons of splendid ore out on the dumpe; and judging from the general appearance of the mine, I believe that by extracting the ore now uncovered, a bonanza of immenee valne will be developed. The ore in this mine shows by aeeay, an average of 40% lead and about $50 per ton in silver.

There is, undouhtedly, enough ore developed to insure a long and remunerative businese in smelting. One-fourth of a mile east of the Black Foreet mine is plenty of water and a splendid furnace eite, connected with the mine hy good road over which ore can be hauled at all times of the year for 50 cents per ton. There is abundance of timber on the monntain for mining and bnilding purposes, and the adjoining foothills are heavily timbered with nut-pine, cedar and mahogany, euitable and convenient for coal purposes. OLD 49ER.

Wells, Elko Co., Nevada, Dec. 13th, 1879.

Buelow Mine, Nevada County.

Among the many valuable minee of Nevada county, the *Herald* of a recent date selects the Buelow mine, as of special interest. The mine is about eight or nine miles west of Nevada City and is located on a hill eituated in the bend, and south of the Soutb Yuba river, just opposite French Corral. About two years ago an incline was sunk on this ledge about 75 feet deep, and the ledge averaged about eighteen inches in thicknese. A year ago a new shaft was sunk about thirty feet from the mouth of the firet shaft, to determine wbether the ledge wae continuous, and the ledge was found to be about twenty-two inches thick on an average. After sinking down abont 40 feet, an incline was etarted from the bottom of the ehaft and extended down a distance of 160 feet, the ledge averaging about the same thicknese the entire dietance. The water commenced to riee and filled the bottom of the incline for a depth of about 40 feet, when it became stationary, and work was resnmed by commencing to run a drift on the ledge just above water level. The drift hae been driven ahead 30 feet, and the men are pushing it ahead. The incline will not be sunk any deeper at present, as it would require the erection of more exteneive appliancee to control the water. The ledge runs eaet and west. Mr. F. Manegold ie the foreman of this enterprise and very kindly explained everything to the reporter.

The preopecte in this mine are very brigbt, being a fiesure vein mucb can be expected. The ore is a rich arsenical, carrying a black and red oxide of copper. The copper sulphurets run as high as 45% gold. The average per ton when worked by mill process is $50. The decomposed arsenical ore near the snrface shows free gold in many placee. There is a large quantity of ore in eight and we underetand that work is to be pushed. The owner has put up new buildings and made other improvements. The owner ie nsing a whim at preeent for hoisting purpoeee. A tunnel run in 500 feet will give 600 feet of depth of vein and drain the mine. We understand that it is proposed to rnn this tunnel soon. There can be no doubt from all indicatione, that the mine will form a permanent and profitable piece of property. Work is being vigorously prosecuted at preeent to effeot a thorough prospect, so as to determine the amount of ore and the extent of machinery which the owner will be juetified in erecting.

ACCORDING to the Salt Lake City Treasurer'e report, it coet $157,372.96 to run tbe city government one year.

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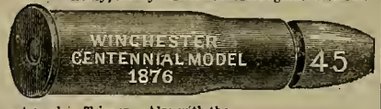

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Danger and Death in Sewers.

Within the last two weeks there have been terrific explosions of gas in sewers in this city and in Oakland. In both cases the evil was from the collection of illuminating gas from faulty pipes in the adjacent sewers and rising thence into the dwellings communicating with the sewers. In Oakland there was a house well nigh demolished by the explosion which followed the ignition of the gas. In this city the gas was also ignited in a dwelling, but the main explosion occurred in the sewer in the street, the earth giving way, great jets of flame bursting forth, and then a great chasm appearing through the street along the line of the sewer. Such alarming occurrences as these are rare, and they can happen only in towns furnished with illuminating gas and street sewers, and in such situations they are always liable to endanger life and destroy property, unless far better systems are adopted in sewering. Notwithstanding nearly all men know that sewers are receptacles for gases which may at any time bring disease and death to citizens, there still exists a sublime indifference to the deadly menace, and no attempts are made to ventilate the sewers by shafts, which would draw off the gases into the upper air, where they would be dissipated and carried away. This must ere long be done, or untold loss of life and property may occur from causes which have thus given some inkling of their power.

But it is more with reference to the evil of gas generated in rural cesspools and drains that we would speak at this time. City explosions may call attention to another class of dangers which are most insidious, unattended by frightful explosions, but are far wider reaching in their effects. The dread fevers and other diseases which break out here and there in districts apparently the most salubrious are doubtless most of them due to the folly of residents rather than to what are termed natural causes. This subject is fully enlarged upon in the report of the State Board of Health, which has just issued from the State printing office. Dr. F. W. Hatch, Secretary of the Board, has made the subject a careful study, and from his article we draw the following valuable and practical suggestions:

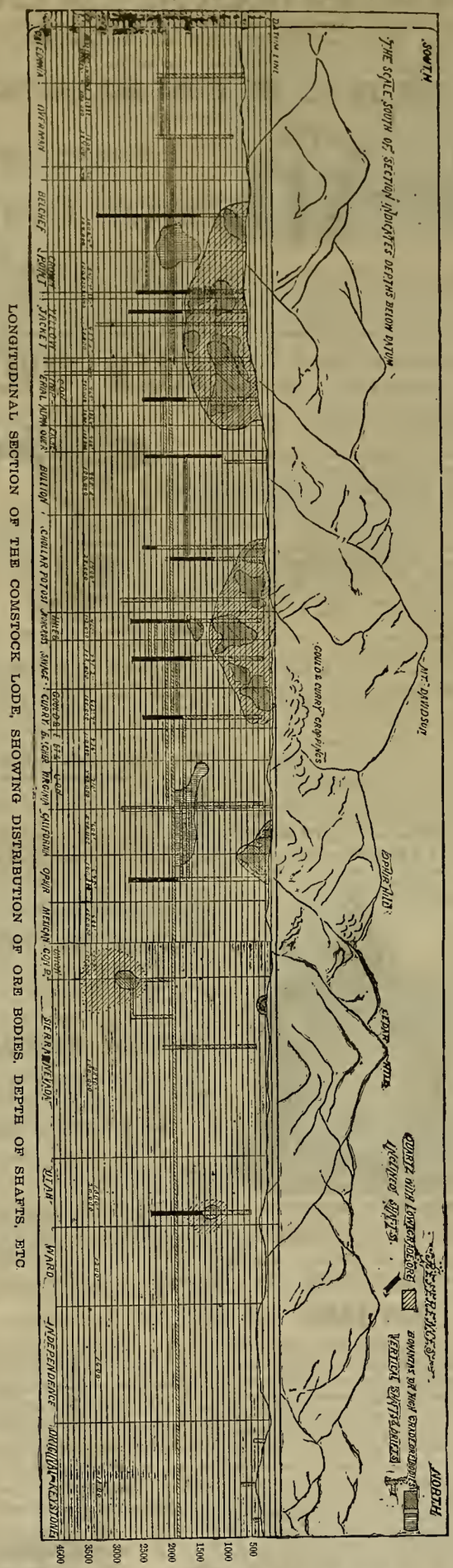
In the arrangement and construction of both drains and cesspools the chief concern should be to keep the gases which arise from entering the house and poisoning its inmates. No fact in sanitary science is now better established than that sewer gases do arise from the sources indicated, and that they do, without proper precaution, find their way into dwellings and become the source of disease. The records of medicine are replete with the evidences of these facts, and the recent investigations of sanitarians in this country and in Europe have placed them out of the reach of successful contradiction. It is indispensable, then, that all communicating drains should be properly constructed. The materials of which they are composed should be sound, non-porous, and the drain should be laid with a *fall* or slope sufficient to carry off, without obstruction, the materials discharged into them. Glazed stone-ware pipes are generally considered the best, being durable and so smooth upon the inside as to facilitate the easy and uninterrupted passage of their contents; and they should not be too large, thereby diminishing the rapidity of the current through them. In general, pipes of four or six inches in diameter, with a fall of one and a half or two feet per hundred, will suffice for an ordinary house drain. They should be properly *trapped and ventilated.* They are often ineffectually flushed, become foul, the gases generated within them must find an outlet, and none so accessible as that which, under the arrangement often adopted for the communicating drains, finds its exit into the bath-room or living rooms of the dwelling. The higher the temperature of the air of the room, as compared with that of the drain or sewer, the more rapid and certain the inflow of polluted air.

In many towns, and in isolated dwellings, especially in the country, the cesspool or vault is resorted to as a recognized though necessary evil. To reduce the dangers arising therefrom to the minimum, they should be well cemented so as to be water-tight, arched over and ventilated at the top, and sufficiently small to require emptying at least once or twice a year, and frequent disinfection. As commonly built they are mere holes, loosely bricked or boarded up in such a manner as to permit the percolation of their liquid contents into the surrounding soil, thence to flow, it may be, into the well from which the drinking water is supplied. Too many instances have been recorded of the dangers arising from these sources to permit a doubt of their reality. However these conditions may be, the drain must be *ventilated.*

Various plans have been adopted to effect this purpose. One of the most efficient—the only certain method—is to be found in the construction of the soil-pipe, its continuation above the roof of the building, thus forming a ventilating shaft, which should be without abrupt or angular curves, and of equal diameter in its entire length. In carrying the ventilating pipe above the roof of the house, care is to be taken that it does not terminate near the windows, or even the flue of a chimney. In certain directions of the wind, or under certain conditions of temperature, incurrents into the house may be established, which will carry with them the gases but just escaped from the soil pipe.

A New Map of Comstock.

We present our readers in this issue, as a matter of useful reference, with an engraving,



showing a longitudinal section of the Comstock lode, compiled from the latest data. It shows the proper depths of the shafts, shape and size of ore deposits, etc. The map was made from one on a much larger scale just issued by the San Francisco News Company, and for sale by them.

The deepest mine on the continent is on this lode—the Belcher—the shaft of which has reached a perpendicular depth of 3,000 feet, which is 300 feet deeper than any other on the lode. The incline starts from the 900 level, and makes its plunge at such an angle as to require the incline to run about 160 feet to make 100 feet perpendicular depth, and hence stretches away about 3,360 feet. In making this depth of 2,100 feet perpendicularly, the incline carries the workings in the bottom 2,625 feet east of the shaft.

Just at this moment, and it is to be hoped only temporarily, the mining prospects of the Comstock are under a cloud. Developments still progress, however, and work continues steadily, explorations being advanced to depths below points considered a few years ago impossible to work.

It is scarcely necessary to call attention to the details of this map, since the main features are pretty well understood among us. It will serve as a means of reference to keep track of future improvements, and its details explain themselves quite clearly. Other articles referring to this great lode, appear on other pages of this number of the PRESS.

Academy of Sciences.

At the regular meeting of the California Academy of Sciences on Monday evening last, the Nominating Committee presented the following "Regular Ticket" for officers for 1880: President, George Davidson; 1st Vice-President, J. B. Moore; 2d Vice-President, Dr. Hermann Behr; Recording Secretary, Charles G. Yale (of the MINING AND SCIENTIFIC PRESS); Corresponding Secretary, S. B. Christy; Treasurer, Elisha Brooks; Librarian, Charles Troyer; Director of Museum, W. G. W. Harford; Trustees, W. Ashburner, R. E. C. Stearns, Geo. E. Grey, B. B. Redding, Robert C. Harrison, Thomas P. Madden, J. M. McDonald. Mr. W. J. Fisher, who has spent the past summer in Alaska, read a description of Kodiak island, its resources, inhabitants, etc. Mr. Fisher left the whaler, *Mt. Wollaston*, afterwards lost, and returned here on one of the Alaska Co.'s vessels. He has been engaged in collecting natural history specimens.

Prof. Geo. Davidson read a very interesting paper on "Scientific Explorations in the United States." He also read a communication from A. F. Goddard, of Sacramento, calling the attention of the Academy to some newspaper errors touching his position as to the line and duration of totality of the approaching eclipse of the sun. The Professor thought that the correction of newspaper errors might be left to the newspapers themselves, and that no action by the Academy was necessary.

The librarian called the attention of the members to the third edition of Mr. J. S. Phillips "Explorers', Miners' and Metallurgists' Companion," a very valuable work, published in this city by the author. The book received was the first volume, of handy pocket size, for "Explorers and Assayers." The other volume treats more of metallurgy, but this one is a suitable one for use in traveling or prospecting.

Coming.

What? Christmas of course. Before the next issue of our paper reaches its readers, that pleasant holiday, whose annual recurrence brings light and joy to so many homes, will have come and gone. An occasional holiday like this affords a good breathing spell, and may be aptly termed one of the safety-valves of nature. Ordinary cares are laid aside for the pleasures of social gatherings and family reunions, which may be looked backed to as oases in our work-a-day lives.

We sincerely hope that this may be a really Merry Christmas to all our readers; that looming visions of turkey and fun may be verified, and that amid all their pleasures they will not forget to make an effort to bring happiness to others, perhaps less fortunate about them.

COPPER IN LIVERPOOL.—From James Lewis & Sons' monthly circular on ores and metals, we learn that during the month of November 900 tons of English copper were shipped to the United States. Arrivals of ore from Chile have been during the month 3,183 tons. From other countries the arrivals in Liverpool and Swansea have been 2,499 tons. The deliveries have been small, very little furnace material having been purchased by the smelters. Latest quotations are as follows: Dec. 1st, bars, good ordinary brands £66 10s to £66 15s per ton on the spot, and £67 10s for distant arrival. Ore 13s 4½d to 13s 6d, and regulus 14s per unit. Stocks of West Coast are 30,190 tons, against 28,000 tons on Nov. 1st.

ASSAYING AND ORE TESTING.—The assay office of Messrs. Kustel & Riotte, corner of Pine and Leidesdorff streets, is worth a visit at any time. They are always at work testing batches of ore by some process or another. They have a quartz mill to crush wet or dry, amalgamating pans and settlers, a roasting furnace, smelting furnace, refining furnace, arrangements for leaching process, and in fact are prepared to work lots of ore in any desired manner, so as to determine the best process for its treatment. They have all the necessary appliances for testing and assaying, a sampling floor, etc. Altogether their outfit is complete for carrying on any kind of work on a small scale.

THE Internal Revenue collections in the San Francisco district last week amounted to $35,874, making a total since January 1st of $2,040,958, against $1,821,700 in the corresponding time last year.

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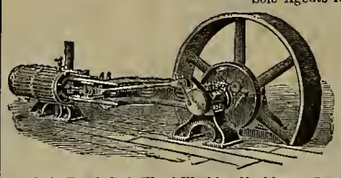

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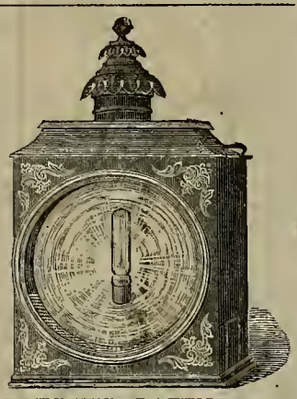

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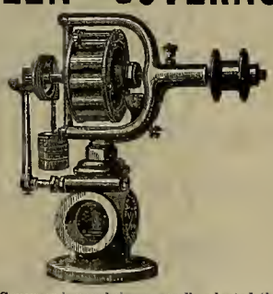

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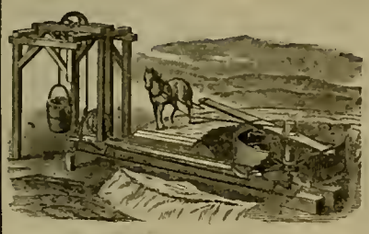

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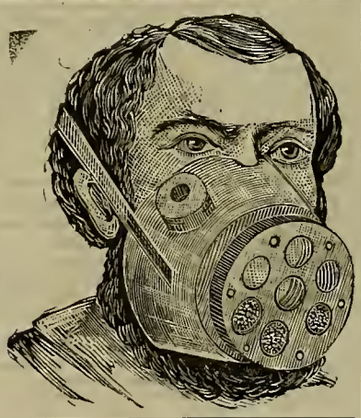

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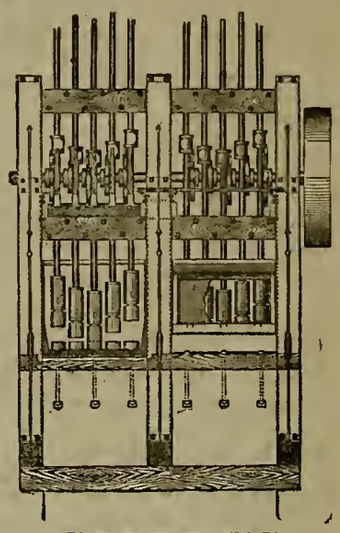

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Author of— SAN FRANCISCO.

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CONTINUED FROM PAGE 389.

JACK RABBIT DISTRICT.

THE DAY.—Pioche *Record*, Dec. 13: The ore house is filled with ore that will work $200 per ton. On the dump near the tunnel a large quantity of ore is piled up. The main tunnel is in 795 ft. A turn is here made of 47 ft to the west, where the bonanza was struck. A drift was run from the bottom of a winze, sunk 38 ft below the level of the tunnel for a distance of 60 ft all in ore, and showing a body of ore 60 ft in length and at least eight in width. None of this ore has yet been worked, but 100 tons of it were shipped to the Raymond & Ely mill, at Bullionville, which is estimated will average at least $200 per ton. This ore is altogether different from the rich ore found in the pocket which was struck 25 ft from the surface. While the ore in that pocket carried 20% moisture, the ore of the new discovery, which is 435 ft deeper, only carries from 8% to 12%. With the present force of men (14) the company extract 15 tons of ore per day. A drift is being run from the top of the winze north and is in 47 ft, while another drift is being run to the southwest, and has a length of 60 ft from the turntable. The following assays were made by Chas. Hopkins, taken from the same samples as those assayed by Mr. Hoffman: purple, $193,67; red, $257.61.

PIOCHE DISTRICT.

HILLSIDE.—Pioche *Record*, Dec. 13: Work cutting for station on 7th level has been commenced, and connection with winze No. 2, east, will be made in a few days. Recent assays of ore body on west 6th level give a larger per cent. in lead than formerly; the two winzes being sunk on it still carrying the same character of ore and giving average assays. The upraise drift above the main ore body, extreme east 6th level, has been pushed some 40 ft, showing high-grade ore, but light in lead. Good headway is being made stoping on the 5th and 6th levels, the greater part of the ore being taken out coming from that part of the mine. New machinery working well.

ARIZONA.

SILVER DISTRICT.—Cor. *Arizona Sentinel*, Dec. 13: Thos. Hughes has struck it rich on the Pacific. This claim makes a wonderful showing, the croppings alone stand up 150 ft in hight, which can be quarried. The shaft is down 12 ft. The metal seam has now widened to 20 inches, seven of which is the same kind of ore found in the Red Cloud. Two men get out of this shaft 1,000 pounds per day, and a lot is sacked for ready shipment, which will readily sell for $30 in 'Frisco. The Iron Cap has at least 260 tons of $40 ore on the dump. The Red Cloud has seven men at work, taking out 20 sacks of ore per day. The Princess has 25 tons of ore ready to sack. The Remnant and Melissa claims have been sold. Copeland is building his four furnaces, of one ton capacity each, and a refining furnace. The camp has been christened Pacific City.

SILVER BELT MINE.—*Arizonian*, Dec. 12: This mine is producing superior ore, and large bodies for stoping are now uncovered. Another shipment of bullion will soon be made. Mr. Blake has made heavy advances on the ore, and thus enabled the company to prosecute its work with great vigor. The New York Syndicate are asking for an extension of time on their bond, but, with the present favorable showing of the mine, the owners are not certain that they would be consulting their own interests by granting the request. Frank Schultz is in town from his gold claim, near the stage road, about one mile this side of Iron Springs. From him we learn that he is now tunneling on a spur from the lead, and has, by exact measurement, 4½ feet of ore in the tunnel. The ledge itself is of unknown width, the croppings are broken up and intermixed with country rock. Prospects made with a horn spoon show gold for a distance of 250 feet across the course of the ledge.

AROUND PRESCOTT.—It is daily becoming more apparent that Prescott is geographically the center of a great gold-bearing section, and ultimately our capitalists will be compelled to turn their attention towards the extraction of these ores.

GLOBE ITEMS.—*Silver Belt*, Dec. 13: Bullion shipments for November from the Stonewall Jackson were $44,000. We have been shown by Mr. Neil Dougherty a fine specimen of horn silver ore taken from the West Richmond mine, which is very rich. The contents of eight car-loads of freight for the Baldwin mill is now on the road between here and Florence, and will be at the mill-site early next week. The grading for the mill-site is about completed. Messrs. Thatcher & Morehead are about to commence work on their property, the Southwest Alice.

COLORADO.

SILVER CLIFF DISTRICT.—Silver Cliff *Prospector*, Dec. 10: Nine months ago, when this camp was but a mere prospect, and old miners were doubtful as to the success of the district being mineral bearing, and speculators were pushing their schemes through in a hurry, through fear of a failure and general collapse, the *Prospector* predicted then the success of the camp, and to-day mills and smelters that were then imaginary, are at work, and the rich ore so abundant all through this district is being taken out in great quantities, and our prospect town and camp of nine months ago, are the most flourishing in all of the Centennial State. For months and months nothing save probable small quantities of ore, and pelts gathered by itinerant hide and wool dealers, was shipped from this point. The business of the camp was all ontgo instead of income. How different now. To-day we find our population increasing, freighters busy hauling goods, with not less than 200 tons of ore and bullion for shipment, and not teams enough to be found to do the work, and, be it known, our smelters have but just commenced. Not only this, capitalists are constantly coming in. One 40-stamp mill is almost ready for work, a 20-stamp mill is under course of construction, another 40-stamp mill will be put up soon, while Eastern parties who are interested largely here propose erecting a 200-stamp mill in the spring and establishing in our midst a banking house with great capital.

IDAHO.

SAW-TOOTH DISTRICT.—*Yankee Fork Herald*, Dec. 6: From Smith and Mathere we learn that the miners of the district have been developing their ground and building houses, to be in readiness for an early start in the spring. The streams are yet open, and by another season, when the miners are better prepared to remain there, work on the mines can be kept up all winter without any further inconvenience than that usual to mountain camps. Smith's party, composed of himself, Mathere, Craig and Sullivan, went in early in the season, and were exceedingly fortunate in making discoveries. Even in this brief period, some of their locations have proved quite valuable, and are being sought after by capitalists. They made 13 discoveries. In all these claims more or less rich ore has been found. The veins vary in width, generally being from two to five feet, and the ores assaying from $100 to $700 per ton. The highest assay of selected ore was had from the Columbia, $12,000. The celebrated Lucky Boy, discovered in the fall by John Collins, is an extension of the Scotia. The veins become freer with development, and are accepted as milling ores. The location of Saw-Tooth city is said to be very beautiful, with every natural advantage in its favor. These gentlemen predict that it will become quite a prominent place next season, as it is only about 50 miles by nearest route to Bonanza, and about the same distance to the late survey of the contemplated Oregon branch of the Utah and Northern railway.

MONTANA.

THE ALICE BONANZA.—*Miner*, Dec. 9: The Alice mine developments have exposed the fallacy of supposing that Montana mines would not pay below water levels. The operations which have been prosecuted within the last month, have caused an entire and much improved change in the aspects of the mine. The ore bodies lately shown up entirely dwarf all previous discoveries, and stopes are now being raised compared with which, those that have supplied the mill for the past two years, sink into insignificance, extensive as they were. On the first level it is estimated there is a reserve of 10,000 tons of ore. Five thousand tons, assaying from $25 to $65, have been already taken out. On the second level the ore body is already opened up for a distance of about 80 ft, showing from 9 to 14 ft of 05-ounce ore. On the third level the ore body averages from 15 to 20 ft in width. On the fourth level the ledge is 37 ft wide. An ore chamber as at present excavated is 40 ft square. The hanging-wall chute is at least 300 ft in length and massive in width as developed on the second and third levels and opened in width on fourth level, but length unknown, and just making its appearance on fifth level. Several months' work will be required on four and five to gain an idea of its length and value. The footwall chute is small at second level, large at third and already found at fourth, though not yet developed in length. The eastern chute cannot be reached on four or five for a considerable period, but it has been followed to a considerable depth from No. 3 by a winze. The eastern and footwall chutes are of the same character of ore and running in the same direction, and most likely will be found when drifts have been run to be one continuous ore body extending the whole length of the mine. All the company requires now is increased milling capacity. The ore at present being produced is exceptionally hard, though after roasting it is easy of amalgamation. The stamps cannot, under the most favorable circumstances, crush more than one ton each per day. It is already certain that a 40-stamp mill will be erected in the spring which, with the present power, will make a crushing capacity of 60 tons per diem.

UTAH.

SILVER REEF NEWS.—*Miner*, Dec. 13: The Christy company's mill was closed down for general repairs on the 1st instant, after a constant run of twenty-three months, during which time it turned out over half a million dollars in fine bullion. The mill will be started up again on the 15th instant, fully prepared for another two years' run. The company's mines to-day are looking better than ever, and from the large area of good mining ground owned, we believe they could easily keep three five-stamp mills supplied with ore instead of only one.

THE GIBFRIED STRIKE.—In last Saturday's *Miner* brief mention was made of an important mineral strike on the river, about four miles from town. The report was not at all exaggerated, as we have since learned. The strike was made near Babylon by Con. Gibfried, and the discoverer in his claim at the find, named the claim after himself—the Gibfried. The ledge was discovered by its surface outcroppings, and a very little work has developed a five-ft vein of ore that will average $40 to the ton. The assays made thus far have given from $20 to $120 per ton.

THE Horn Silver company have ordered very complete hoisting work, of direct acting type, to hoist 600 ft. The machinery was made in Arlington, N. J., by San Francisco parties who have recently established themselves in the machine business there.

TINTIC DISTRICT.—Cor. Salt Lake *Tribune*, Dec. 12: For various reasons most of these mines are not working at present. Some on account of the first deposits being worked out, and have not the means for the further development, others on account of the ores being too low grade to ship, others still have attained depth and can't be profitably worked without machinery. In a few cases water has been struck that cannot be controlled, only by heavy machinery. Others are held for speculation by outsiders who have no intention of working the property further than keeping up assessments. All of the properties, with few exceptions, are waiting for capital, and capitalists can secure substantial prospects at figures to suit, providing they come to the miners, without going to the wolf or middle-men.

WASHINGTON.

NEW MINE.—*Oregonian*, Dec. 13: The first shipment of 40 tons of coal from the Cumberland Coal company's mine, on the Skagit river, will be made to this city next week. The mine, we are informed by Mr. J. J. Conner, the Superintendent and principal owner, consists of a vein of rich bituminous coal pitching into a mountain at an angle of 60°, and with an average width of six ft. It has been traced a mile and a half along the side of the mountain from where the first croppings are found. It is located 35 miles up the river, and little over half a mile back from the bank. This makes the sixth coal mine already open, or it is expected, soon to be opened in western Washington. They are as follows: The Newcastle, Renton-Talbot, Seatco, Cedar River, Cumberland and Carbon River. The two latter contain bituminous and semi-bituminous coals, while all of the former contain only lignite, generally of a superior quality for steam purposes. From this it would appear that western Washington will soon control the entire coal business of the Pacific coast. It is claimed that as soon as the Carbon River and Cumberland mines are opened they will crowd the product of the British Columbia mines from the California market, as the coal from these mines will be exempt from duty, is of the same quality and can be produced more cheaply.

REMOVAL.—John Taylor & Co., importers and dealers in assayers' materials, chemicals, chemical apparatus, etc., for many years located at No. 512 Washington street, have removed to the much more commodious and convenient new building, Nos. 118 and 120 Market street, the stores running through to 15 and 17 California street. The very large stock of this firm has not yet been all removed, and a good deal of it will be sold cheap to save removal. The new premises are very much more extensive than the old ones, and they now have a very handsome store, with more conveniences for the storage and display of goods. The firm is following the march of improvement by getting a more central location for their business.

OURSELVES.—We call attention with pride to our issue of this week, comprising 24 pages, replete with information of varied and useful character. Our illustration of the Comstock lode will be found very useful for reference, showing as it does the shafts, ore bodies, etc. Our next number will conclude the volume, and will contain an index of all subjects treated within the past six months.

The commencement of a volume is a good time to subscribe, and we hope that this sample of our efforts to maintain a trustworthy, reliable and useful journal, will meet with suitable appreciation in this direction.

LIBRARIAN.—Mr. C. H. Robinson, who occupied a position upon the editorial staff of this journal, has accepted the librarianship of the Free Library in this city. Mr. Robinson has shown himself to be a man of energy, of scholarly attainments, and endowed with versatile talents. We hope his acquaintance with the literature of several languages and his urbanity of manners will make him both valuable and popular in his new field of labor.

THE foundry at Bodie hasn't business enough to keep it running, the work being sent to San Francisco and Virginia City.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING DECEMBER 2D, 1879.

222,222.—PILLOW SHAM FRAME AND HOLDER—John R. Adams, Oakland, Cal.

222,220.—CASTER—Geo. S. Andrews, S. F.

222,252.—HANDCUFF—Robert H. Daly, Napa, Cal.

222,294.—VEHICLE WHEEL HUB—Angus McKellar, Camp Douglas, Utah Ter.

222,296.—COOKING UTENSIL—Jas. McMurray, East Portland, Ogn.

222,298.—DOUBLE CHAIN STITCH SEWING MACHINE—John H. Mooney, S. F.

222,210.—APPARATUS FOR GUIDING HEALERS—Joshua M. Steves, Stockton, Cal.

FOR THE WEEK ENDING DECEMBER 9TH, 1879.

8,993.—STREET LAMP—E. Boesch, S. F. (re-issue).

222,380.—DREDGING MACHINE—E. Chaquette, S. F.

222,381.—MACHINE FOR RAISING TAILINGS IN MINES—E. Chaquette, S. F.

222,418.—OPERATING PUMPS—J. Moore and G. W. Dickie, S. F.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

News in Brief.

DENIS KEARNEY has gone to Washington.

THE negro exodus from Texas to Kansas continues.

CALCRAFT, for 46 years the hangman of England, is dead.

ARMY officers predict that war with the Utes is a certainty.

BROWN, the last of the Mendocino outlaws, was jailed at Ukiah Sunday.

THE Chileans have obtained another victory over the opposing allied forces.

LORD LYTTON, Viceroy of India, has been fired at by a drunken native of Calcutta.

THERE has been further fighting in Afghanistan, the British troops being successful.

THE Crown Prince advocates that Germany acquire territory in the Samoan Groups.

THE libel suit of Carlotta Patti against the *Post-Dispatch* is being tried in St. Louis.

A GENERAL reduction of salaries in the municipal department of this city has been made.

MANY people are starving in Persia and Turkish Turkistan, and the need of relief is urgent.

A UNITED STATES judge in Tennessee has decided that slavery is not punishable by indictment.

THE House Committee on Post Offices and Post Roads favors the bill establishing return letter offices.

A ST. PETERSBURG dispatch says that Russia is negotiating for a line of steamers between Siberia, China and Japan.

GENERAL GRANT has completed his tour around the world, and was given a reception at Philadelphia on the 16th instant.

A BIG strike is pending among the employees of the packing houses in Chicago. The Cincinnati brewers also threaten to strike.

THE work of extension of the Texas Pacific railroad is to commence immediately, and Jay Gould is reported to have full control.

REPRESENTATIVE PAGE has introduced a bill proposing an appropriation of $100,000 for the erection of a postoffice at Sacramento.

THE Governor-General of Kharkoff, Russia, has issued an order prohibiting to the public the manufacture, sale or possession of any explosive materials.

JUDGE MYRICK, of this State, has decided that real estate owned by a sponse before marriage, with its increased value, continues separate property.

THE recent heavy rain storm in southern Oregon resulted in great damage. Immense quantities of lumber, several mill-dams and thousands of logs were swept away.

THE Omnibus Railroad Company has filed a protest with the Supervisors against the granting to Baldwin, Hallidie and others a franchise to run a railroad to the Presidio.

SARAH WINNEMUCCA has sent to Secretary Schurz an affidavit preferring charges against Agent Rhinehart, in charge of the Malheur Indian Reservation, and asking for his removal.

SATURDAY, in the porch of the Limerick County Club House, an evicted tenant with a cudgel felled to the floor Lord Fermoy, who resides in County Limerick. Lord Fermoy remained senseless for a time. The assailant was immediately seized and taken to prison.

EMPLOYEES of the Union Iron Works have presented Henry Dimmick, who has been foreman for 15 years, with a well-executed portrait of himself.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

EXTRA COPIES can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Gruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

Chew JACKSON'S BEST Sweet Navy Tobacco

GENERAL MERCHANDISE.

[WHOLESALE.]

WEDNESDAY M., December 17, 1879.

CANDLES.		**OILS.**	
Crystal Wax	17 @ 17½	Pacific Glue Co's	
Eagle	12 @—	Neatsfoot, No 1	1 00 @ 90
Patent Sperm	30@—	Castor, No 1	1 30 @ —
CANNED GOODS.		do, No. 2	1 20 @ —
Assorted Pie Fruits,		Baker's A A	— @1 30
2½ lb cans	2 25 @ —	Olive, Plagniol	5 25 @5 75
Table do	3 50 @ —	Possel	4 75 @5 25
Jams and Jellies	3 75 @ —	Palm, lb	9 @ —
Pickles, hf gal	3 25 @ —	Linseed, Raw, hhl	85 @ —
Sardines, qr box	1 67½@1 80	Boiled	90 @ —
Hf Boxes	2 50 @2 75	Coccanut	60 @ —
Marry, Faul & Co.'s.		China nut, ca	72½@ 73½
Preserved Beef,		Sperm	1 40 @ —
2 lb. doz	3 75 @4 00	Coast Whales	35 @ 45
do Beef, 4 lb, doz	6 50 @ —	Polar	— @ 45
Preserved Mutton,		Lard	80 @ 90
2 lb. doz	3 50 @3 62½	Oleophine	— @ —
Beef Tongue	6 25 @ —	Devoe's Brll't	16 @ 17½
Preserved Ham,		Photolite	— @ —
2 lb, doz	6 00 @ —	Nonpariel	— @ —
Deviled Ham, 1 lb,		Eureka	19 @ 20
doz	4 50 @ —	Barrel kerosene	20 @ —
do Ham, ½ lb doz	3 00 @ —	Downer Ker	30 @ —
Boneless Pigs Feet,		Elaine	34½@ —
3 lbs	3 75 @ —	**PAINTS.**	
2 lbs	2 75 @ —	Pure White Lead	8 @ 8½
Spiced Fillets,		Whiting	1½@ —
2 lbs	3 75 @ —	Putty	4 @ 5
Head Cheese,		Chalk	1½@ —
3 lbs	3 75 @ —	Paris White	2½@ —
COAL—Jobbing.		Ochre	3½@ —
Australian, ton	6 50 @ 7 50	Venetian Red	3½@ —
Coos Bay	— @ 5 50	Averill Mixed	
Bellingham Bay	— @ —	Paint, gal.	
Seattle	5 50 @ 6 00	White & tints	2 00 @2 40
Cumberland	13 00 @15 00	Green, Blue &	
Mt Diablo	4 75 @ 5 75	Ch Yellow	3 00 @3 50
Lehigh	11 50 @12 00	Light Red	3 00 @3 50
Liverpool	6 00 @ 6 50	Metallic Roof	1 30 @1 60
West Hartley	— @ 8 00	**RICE.**	
Scotch	— @ 8 00	China, Mixed, lb	4½@ —
Scranton	— @— —	Hawaiian	6½@ —
Vancouver Id	7 50 @— —	**SALT.**	
Wellington	— @ 7 00	Cal. Bay, ton	17 00 @24 00
Charcoal, sack	75 @— —	Common	10 00 @12 00
Coke, bush	60 @— —	Carmen Id	12 00 @25 00
COFFEE.		Liverpool fine	18 00 @— —
Sandwich Id, lb	— @— —	**SOAP.**	
Costa Rica	16 @ 16½	Castile, lb	8 @ 15
Guatemala	16 @ 16½	Common brands	4½@ 6
Java	25 @— 26	Fancy brands	7 @ 8
Manila	17 @— —	**SPICES.**	
Ground, in cs	25 @— —	Cloves, lb	47½@ 50
FISH.		Cassia	19 @ —
Sac'to Dry Cod	2½@ —	Nutmegs	97½@1 10
do In cases	3½@ —	Pepper Grain	14 @ 15
Eastern Cod	— @— —	Pimento	19 @ 20
Salmon, bbls	7 00 @ 7 50	Mustard, Cal.,	
Hf bbls	3 50 @ 4 00	½ lb glass	— @1 25
1 lb cans	1 40 @ 1 50	**SUGAR, ETC.**	
Pkld Cod, bbls	— @— —	Cal. Cube, lb	— @ 12
Hf bbls	— @— —	Powdered	— @ 12½
Mackerel, No. 1.		Fine crushed	— @ 12
Hf Kits	9 50 @10 00	Granulated	— @ 11½
In Kits	3 00 @ 3 25	Golden O	— @ 10½
Ex Mess	3 50 @ 3 75	Cal. Syrup, kgs	70 @ —
Pkld Herring, hx	3 00 @ 3 50	Hawaiian Mol'sses	25 @ 30
Boston Smkd H'g	50 @— —	**TEA.**	
LIME, Etc.		Young Hyson,	
Plaster, Golden		Moyune, etc	40 @ 65
Gate Mills	3 00 @ 3 25	Country pckd Gunpowder & Imperial	35 @ 75
Land Plaster, tn	10 00 @12 50	Hyson	30 @ 35
Lime, Sta Cruz,		Hoo-Chow O	27½@ 32½
bbl	1 25 @ 1 50	Japan, 1st quality	40 @ 60
Cement, Rosendale	2 00 @ 2 25	2d quality	25 @ 40
Portland	4 00 @ 4 50		
NAILS.			
Assted sizes, keg	4 25 @ 4 75		

METALS.

[WHOLESALE.]

WEDNESDAY M., December 17, 1879.

IRON.—	
American Pig, soft, ton	28 00 @35 00
Scotch Pig, ton	26 00 @30 00
American White Pig, ton	25 00 @— —
Oregon Pig, ton	28 00 @35 00
Refined Bar	4 @ 8
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 8
Norway, according to thickness	7 @ 8
COPPER.—	
Sheathing, lb	22 @— —
Sheathing, Yellow	18 @— —
Sheathing, Old Yellow	8 @— —
Nails	25 @— —
Bolts	24 @— —
Brazier's, in all sizes	24 @ 30
Old	16 @— —
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	16 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @ —
TIN PLATES.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft, 7 to 10, lb, less than cask	9½@— 10
NAILS.—	
Assorted sizes	3 50@4 50

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & CO.]

SAN FRANCISCO, December 17, 3 P. M.

SILVER, ¾ par. GOLD BARS, 890@910. SILVER BARS, 10@18 ⅌ cent. discount.

EXCHANGE on New York, 20, on London bankers, 49¾@49¾. Commercial, 50; Paris, five francs ⅌ dollar; Mexican dollars, 93@95.

LONDON Consols, 97 9-16; Bonds (4%), 106¾

QUICKSILVER in S. F., by the flask. ⅌ lb. 37½@38c.

Signal Service Meteorological Report.

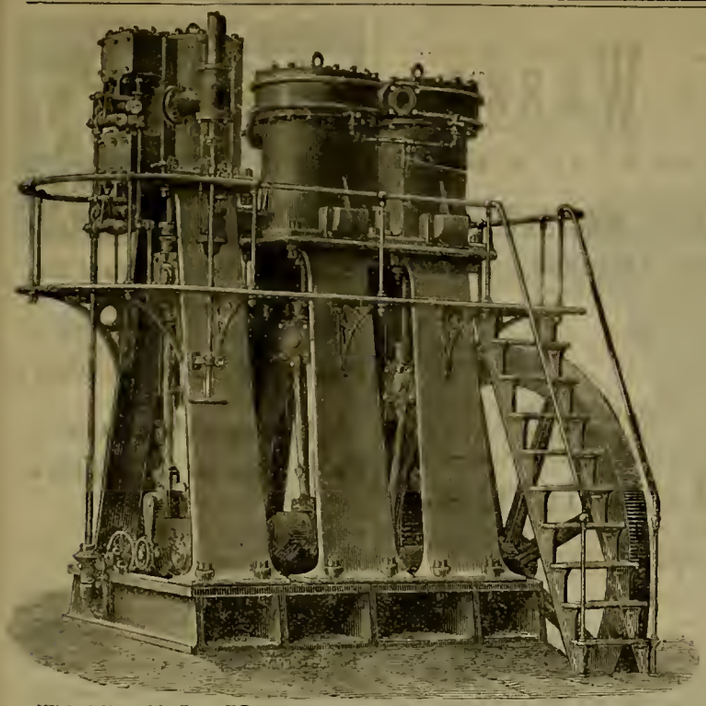
SAN FRANCISCO.—Week ending December 16, 1879.

HIGHEST AND LOWEST BAROMETER.						
Dec. 10	Dec. 11	Dec. 12	Dec 13	Dec. 14	Dec. 15	Dec. 16
30.327	30.383	30.317	30.240	30.268	30.253	30.152
30.159	30.325	30.209	30.179	30.233	30.159	30.063
MAXIMUM AND MINIMUM THERMOMETER.						
56	53	58	64	62	57	56
52	49	46	50	52	47	47
MEAN DAILY HUMIDITY.						
84.3	88.3	78.3	74	66.3	77.7	89.3
PREVAILING WIND.						
N	N	N	N	N	NW	N
WIND—MILES TRAVELED.						
221	71	177	45	87	198	190
STATE OF WEATHER.						
Cloudy	Cloudy	Fair.	Clear.	Clear.	Clear.	Foggy
RAINFALL IN TWENTY-FOUR HOURS.						
Total rain during the season, from July 1, 1879, 6.75 in.						

Acknowledgement and Thanks.

LAKEPORT, Lake Co., Cal., Nov. 2d, 1878.

MESSRS. DEWEY & CO.—*Gentlemen:*—I hereby acknowledge receipt of patent, for which please accept my sincere thanks. When I have any further business in this line I shall certainly employ you. With kind regards, I am, Yours very truly, CHAS. SLATTERBECK.



With Adjustable Cut-off Poppet Valve Engine, and Forced Iron Crank Shafts.

Mining Machinery Depot,

PARKE & LACY,

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NO. 7 IMPROVED

AIR COMPRESSOR.

SPECIAL ADVANTAGES.

Absolute certainty in the action of the valves at any speed. Perfect delivery of the air at any speed or pressure. The heating of the air entirely prevented at any pressure. Takes less water to cool the air than any other Compressor.

Power applied to the best advantage. Access obtainable to all the valves by removing air chest covers. Entire absence of springs or friction to open or shut the valves. No valve stems to break and drop inside of cylinders.

Have no back or front heads to break. The only Machine that makes a perfect diagram. No expensive foundations required. Absolute economy in first cost and after working.

DISPLACEMENTS in air cylinder perfect. Showing less leakage and friction than our competitors and a superior economy of about 20 per cent.

Small Sizes made in Sections not to Exceed 300 lbs.

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is the leading mining journal in America, and enjoys a large circulation among the more intelligent operators and workers in the gold fields of the world.

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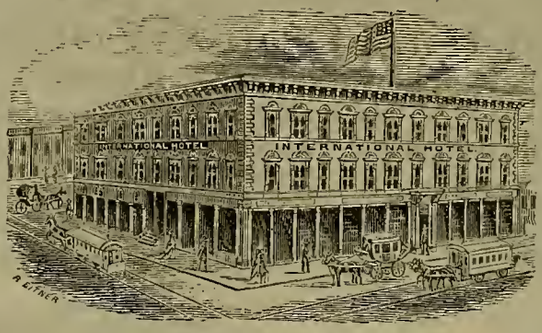

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DIVIDEND NOTICE.

OFFICE OF THE

Consolidated Virginia

Mining Company, Room 26, Nevada Block, San Francisco December 13th, 1879. At a meeting of the Board of Directors of the above-named Company held this day, a dividend (No. 51), of Fifty Cents per share was declared, payable on TUESDAY, December 23d, 1879. Transfer Books closed until the 24th instant.

A. W. HAVENS, Secretary.

REMOVAL.

JOHN TAYLOR & CO., importers of Assayers' Materials, Mine and Mill Supplies, Druggists' Glassware, etc., will remove to Nos. 118 and 120 Market street, and 15 and 17 California street. Our stock of Druggists, Sundries, Perfumery and Fancy Articles we shall keep in our present location till after the Holidays. Many articles desirable for HOLIDAY PRESENTS we will sell low to save expense of moving.

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Mining and Other Companies.

Aurora Mining Company—Location of Principal place of business, San Francisco, California. Location of works, Iowa Hill, Placer County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the third day of December, 1879, an assessment, No. 1, of ten cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the Company, No. 28 Sansome street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Third day of January, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the 19th day of January, 1880, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors. P. CONKLIN, Secretary.

Office, 28 Sansome Street (up-stairs) San Francisco, Cal.

Butte Hydraulic Mining Company.— Location of principal place of business, San Francisco, California. Location of works, Butte County, Cal.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 2) two levied on the Thirty-first day of October, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
E Poirson	13	2½	$25 00
L Laplerre	22	2½	25 00
H Marcoux	24	2½	25 00
J B Lussier	25	2½	25 00
John Britt	26	2½	25 00
Geo W Deitzler	37	5	50 00
N Desautelle	41	2½	25 00
Jos Lucier	42	2½	25 00
N Goldtree	43	7½	75 00
Geo Moreau	44	5	50 00
Z Gervsis	45	10	100 00
Geo Moreau	46	5	50 00
Geo W Deitzler	47	15	150 00
A S Hawes	17	10	100 00
J Callandreau	4	10	100 00
A M Wilder, Trustee	1	10	100 00
A L Lengfeld	5	5	50 00
L L Demery	6	5	50 00
W E Lutz	7	5	50 00
Geo. H. Powers	11	5	50 00

And in accordance with law and an order of the Board of Directors made on the 31st day of October, 1879, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the company, room 3, No. 220 Sansome street, San Francisco California, on Monday, the 22nd day of December, 1879, at the hour of 10 o'clock A. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

L. L. DENNERY, Secretary.

Office, room 3, No. 220 Sansome St., San Francisco, Cal.

POSTPONEMENT.—By order of the Board of Directors the above sale of delinquent stock of the Butte Hydraulic Mining Company is postponed to the Fifth day of January, 1880, at 10 o'clock A. M.

L. L. DENNERY, Secretary.

Cataract and Wide West Hydraulic Gravel Mining Company. Principal place of business, San Francisco, California. Location of works, Echo Mining District, Calaveras County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 15th day of November, 1879, an assessment of Twenty-five cents (25 cts.) per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary at 26½ Kearny street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on Monday, the 22d day of December, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 12th day of January, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

WM. B. LAKE, Secretary.

Office, 26½ Kearny Street, San Francisco Cal.

Land Purchasers' Association. — Office, No. 318 Montgomery street, San Francisco, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment, (installment No. 43), levied on the 5th day of November, 1879, the several amounts set opposite the names of the respectives shareholders, as follows:

Names.	No. Certificate.	No. Shares	Am't.
James E Boyce	No cert. issued	1	$6 00
V Chevallier	No cert. issued	1	6 00
John A Collison	20	1	6 00
David S Hutchinson	251	1	6 00
Mrs M A Hutchinson	252	1	6 00
Chas Lemon	170	2	12 00
Mrs N McCarty	No cert. issued	1	6 00
Mrs W W Newell & D Hicks (guardians)	242	1	6 00
Mrs W W Nowell & D Hicks (guardians)	248	1	6 00
Mrs W W Newell & D Hicks (guardians)	247	8	48 00
F A Roulcau	250	3	18 00

And in accordance with law, and an order of the Board of Directors, made on the 5th day of November, 1879, so many shares of each parcel of said stock as may be necessary, will be sold at public auction at the office of the Secretary, 318 Montgomery street, San Francisco, California, on Saturday, the third day January, 1880, at the hour of one o'clock, P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

C. S. WRIGHT, Secretary.

Office, 318 Montgomery street, San Francisco, Cal.

Numa Mining Company.—Principal Place of business, San Francisco, California. Location of works, Humboldt County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 23rd day of October, 1879, an assessment (No. 2) of Two Cents (2) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 328 Montgomery St., room 21, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 24th day of November, 1879, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 15th day of December, 1879, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

DAVID WILDER, Secretary.

Office, 328 Montgomery St., Room 21, San Francisco, Cal.

POSTPONEMENT.—The day of delinquency of the above assessment is postponed to December 22nd, 1879, and the day of sale to January 12th, 1880. By order of the Board of Trustees. DAVID WILDER, Secretary.

Room 21, 328 Montgomery street, San Francisco.

ANNUAL MEETING.

NORTHERN LIGHT GOLD AND SILVER MINING Company. The annual meeting of the stockholders of the above-named Company, for the election of Directors, and the transaction of any other business that may properly come before it, will be held on MONDAY, the 5th day of January, 1880 (first Monday in January), at the hour of one o'clock P. M., on that day, at the office of the Company in this city, Room 30, No. 310 Pine street, San Francisco, Cal. Transfer Books will be closed Monday, December 29th, 1879, at three o'clock P. M. F. S. MONROE, Secretary.

DIVIDEND NOTICE.

Office of the EUREKA CONSOLIDATED Mining Company, Nevada Block, Room No. 37, San Francisco, December 15th, 1879. At a meeting of the Board of Directors of the above-named Company, held this day, a dividend (No. 50) of Fifty Cents per share was declared, payable on SATURDAY, December 20th, 1879. Transfer Books closed until the 22d inst.

W. W. TRAYLOR, Secretary.

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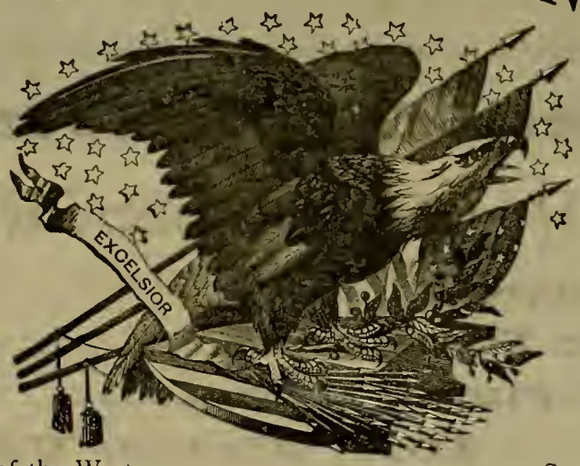

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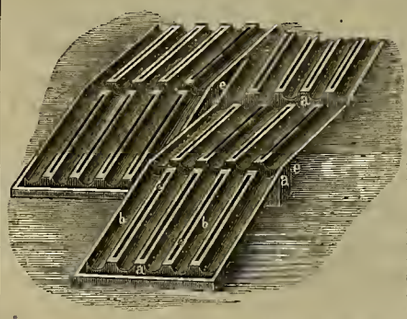

This invention meets a want which has long been felt by Gravel Miners and Millmen, viz.; that of a simple, cheap Riffle which will save the largest possible amount of gold or sulphurets, with the least possible waste of quicksilver. That this Riffle answers all these conditions will be apparent to any practical man who takes the trouble to examine it. The arrangement of this Riffle is such that there is a strong, unobstructed upper-current to carry off and break up the gravel or cement, and a slow under-current, checked by numerous riffles, which give gold or sulphurets a better opportunity of settling than if they were exposed to the force of the main current.

In this Riffle there are cast troughs for the quicksilver, which extend entirely across the sluice, and while they are so placed that the current will naturally pitch towards them, and give every opportunity for amalgamation, the quicksilver is fully protected from flouring or leakage. There is no mechanical skill required in taking out or replacing the sections.

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1½	3¼ x 3½	16½ x 4	250	28 x 28	5 " 10 "	1,000	1,300	48	250
2	3⅜ x 3¾	18½ x 4	250	31 x 31	6 " 2 "	1,350	1,700	60	300
2½	3½ x 3¾	18½ x 4	250	33 x 33	6 " 5 "	1,550	1,825	62	350
3	3¾ x 3¾	18½ x 4	250	33 x 35	6 " 10 "	1,720	2,000	70	400
4	4 x 4	18½ x 4	250	37 x 37	7 " 2 "	1,925	2,300	78	475

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Lodes and Ore Deposits.

Deposits formed by Alteration of Granite.

At a meeting of the Geological Society of London not long since, C. LeNeve Foster, Esq., read a paper "On the Great Flat Lode south of Redruth and Camborne, and on some other Tin Deposits formed by the Alteration of Granite." This paper is specially interesting as showing the probable mode of origin of the lode and the consideration given to the question of the alteration of granite. In order, however, to have a clear idea of the general conclusions reached, some details of the different mines of the lodes will have to be studied, and we take the liberty of making the following condensation or abstract of the first part of Mr. LeNeve's paper, leaving for a future issue that part which relates to the general principles involved.

The hill called Carn Brea, in West Cornwall, near Redruth, forms part of a mass of granite about four miles long, in a direction E. 30° N., generally about five furlongs wide, but terminating both east and west in a long narrow tongue. The granite is surrounded on all sides by the so-called killas or clay slate. To the north of the hill are numerous famous mines, and to the south, again, mining operations have been carried on to a considerable extent. It is some of these latter workings which Mr. LeNeve describes, and which he thinks possibly form part of one great mineral vein stretching for more than three miles from Perseverance mine on the east to South Tolcarne on the west. The continuity or non-continuity of the deposits is not a question which affects the purpose of the paper, the main object of which is to point out how the mineral repositories in question differ from those which are included in the ordinary definition of a *lode* or mineral vein.

Wheal Uny, a section of which at the 130 fathom level is shown in Fig. 1, is entirely dependent on the Great Flat lode. It dips about 46° south, and is much flatter than veins usually are in Cornwall, where 70° is the average dip. A peculiarity of the lode in this mine is that it lies at the very junction of the granite and killas, and if looked at by itself might be considered an example of "contact deposit." However, as the workings to the west show a similar lode or clean granite, it is evidently not necessarily connected with any phenomenon due to contact of dissimilar rocks. In the Fig., *A* shows the "leader." It is in one part 18 inches wide, consisting of a mass of fragments of more or less altered killas (*capel*) with some tin oxide, and it soon dwindles down to a mere *flucan* or vein of clay, with a little quartz only two inches wide. The sides (walls) are very smooth, presenting numerous slickensides; in fact this leader has all the appearance of a mere crack, filled in the main mechanically by fragments of the sides reduced in places to a clay by the attrition of the walls. *B* is the lode, a very fine grained, bluish-gray schorl-rock, with little spots or strings and veins of quartz, cassiterite, chlorite and iron pyrites. *B* is a schorl-rock, known as "grayback", with large grains of quartz in a compact black matrix, not separate from *B* by any distinct line. *E* is hard, compact *capel* or schorl-rock. The killas, *F*, to the south, and granite, *G*, to the north, are rarely seen during the workings in the lode. The crosscuts have proved that there is no wall or definite place of division between the *grayback* and the granite any more than there is between the grayback and the lode, nor is there any straight line of demarcation between the killas and the *capel*.

As may naturally be supposed the lode varies greatly in character. Sometimes the tin-bearing rock is above instead of being below the leader.

At the South Carn Brea mine, west of Wheal Uny, the same lode was followed down 175 fathoms, mainly between the granite and killas, with the same general features. There was this difference, however, the narrow leader being a copper lode 2 to 4 feet wide, as shown in Fig. 2. In this figure, *A*, is the copper lode; *B C*, more or less stanniferous schorl rock—that is, lode and capel; *E* is the schorl rock (derived from killas); *F* is the killas, and *G* granite.

The Wheal Basset lode was originally started as a copper lode, but eventually the Great Flat was intersected, and it is to this vein that the mine is now indebted for the greater part of its produce. The lode is now entirely in granite, and the section shown in Fig. 3 of the workings above the 104 fathom level will explain its character. *A* is the leader, a red ferruginous clay vein with fragments of capel of 2 to 3 inches think. *B C*, lode and capel, that is, stanniferous and non or slightly stanniferous schorl rock, nine feet thick above the leader and six feet thick below. There is no wall between the lode and capel, nor between the capel and granite, *G G*. The stanniferous part has usually a grayish blue color, and is a compact rock, with veins and spots of quartz and cassiterite. The schorl rock, with large grains of quartz in a compact black matrix, is invariably unproductive.

At South Condurrow, the Great Flat lode is entirely in granite, though the thickness of the rock on the hanging wall in the upper part of the mine must be small. The general features of the lode are much the same as in West Basset—a narrow leader, with lode and capel above it. The tin-bearing part averages five or six feet wide, and the lode and capel together will quite make up 12 feet.

Fig. 4 shows a section of South Condurrow,

Fig. 1. Section of Lode at Wheal Uny.

Fig. 2. Section of Lode at South Carn Brea

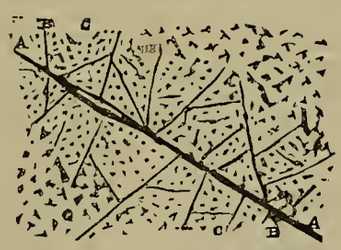

Fig 3 Section at Wheal Basset.

Fig. 4. Section at South Condurrow.

TIN MINES ON GREAT FLAT LODE FORMED BY ALTERATION OF GRANITE.

above the 93 fathom level, in which *A* is the leader. *B*, the lode, *C*, the capel and *G*, the granite. The tin-bearing part here is above the leader.

In many places the Great Flat lode contains a great deal of chlorite, some iron pyrites and kaolin. Occasionally kaolin fills up the cavities in the quartz veins. There is no wall or separation between the capel and granite or wall and capel, the passage is gradual.

Mr. LeNeve says he proved the wall and capel were really schorl rock, by the blow-pipe and microscope. The blow-pipe showed evidence of much boron, and subsequent tests revealed the existence of fluorine, silicon, aluminium, potassium and iron, all component parts of tourmaline. Under the microscope the capel shows a felted mass of minute crystals imbedded in a basis of quartz. In places you observe spots and patches where the quartz predominates. Some of these spots are oval and rounded, others angular, and a few that are naturally hexagonal in sections, naturally suggest the former presence of feldspar.

The rock forming the lode presents a similar matted mass of fine needles in a ground mass of quartz, with granules of cassiterite in strings or veins. The needle-like crystals are very like some larger ones in specimens of undoubted schorl rock previously examined. The microscopical evidence is in favor of the opinion forced on Mr. LeNeve by the blow-pipe reactions, which is thoroughly in accordance with the views so ably brought forward 36 years ago by Prof. Daubree with reference to the mineral association with tin ore.

The S. F. Microscopical Society.

The Seventh Annual Reception of the San Francisco Microscopical Society, was held Friday evening, Dec. 19th, at Mercantile Library Hall. Owing to the inclement weather a number of the exhibitors who reside outside of the city were unable to be present. The attendance, however, was good. The members of the society exhibited the various subjects upon tables arranged around the room. Many of the subjects were very interesting and were particularly well displayed under the costly and beautiful instruments. A list of the exhibitors present and the subjects asigned them is herewith presented:

William Ashburner, diatoms from Santa Monica, diatoms from Nikjoking, Jutland, Denmark, diatoms from Richmond, Virginia.

Charles W. Banks, section leaf of water lily (*Nymphea odorata*) double stained, section of wetlet of date palm (*Phœnix dactylifera*) double stained, section of stem *Bignonia Chamberlanyii*.

Rev. J. I. Bleasdale, D. D., trachea of silkworm.

Charles H. Denison, zircons with gold, gold crystals, azurite crystals.

Henry G. Hanks, salts crystallized from a baby's tear, counterfeit trade dollar, white sugar.

W. G. W. Harford, pollen of *Pinus tuberculata;* pollen of *Cupressus macrocarpa;* pollen of *Equisetum*.

F. A. Holman, M. D., pigment cells in tail of prawn; kidney of sheep, injected; stomach of frog.

J. A. Langstroth, "Our Mutual Friend"—the flea, alive and kicking; wing of moth; insect scales.

S. M. Mouser, M. D., circulation of blood in mesentery of a living frog.

G. L. Murdock, crystallized cinnabar; crystallized gold—native; crystallized gold—artificial.

Warren F. Myers, witch hazel, sections; black walnut, sections; petrified wood, fiber.

E. H. Woolsey, M. D., liver and spinal cord of cat; cornea of frog; human skin.

REPRESENTATIVE POUND will introduce, at the earliest opportunity, a joint resolution proposing a Constitutional amendment making the Presidential term six years, with no second term, and the Congressional term three years.

GEN. GRANT says he has not yet accepted the Presidency of the Nicaraguan Canal Company.

Small Steam Yachts and Licenses.

Small steam pleasure vessels, or yachts, even when no larger than a pilot's yawl, under the present law have to pay annually as much in fees for license and inspection as a trading vessel of 100 tons. Even such an official as the Supervising Inspector-General of steam vessels sees the absurdity and injustice of this, and in his annual report calls attention to the fact and acknowledges that the excessive tax has in many cases actually prohibited the use of such craft. He recommends that the tax be made $5, which he thinks will lead to the building of such vessels, and thus benefit a great industrial interest.

In our opinion, this, in itself, will lead to no very perceptible increase in the number of such small steam craft, though the recommendation is a very sensible one. What is really needed, is the abandonment of the absurd rule requiring a licensed engineer and licensed pilot (which officers must be represented by different individuals) on any steam vessels, no matter how small. It will be seen at once that an enforcement of this rule prevents the building of small pleasure yachts.

There does not seem to be any reason, so far as we can see, why a citizen of this enlightened and progressive republic shouldn't blow himself up as often as he chooses without having to pay a licensed individual to do it for him. As long as he does not carry passengers for hire, and only risks his own life and that of a friend or two, we can't see why the Government should step in and prevent him. The Government does not have any rule against driving a fast horse in a spider-wheel buggy; nor does it prevent oversparring a sailing yacht or vessel, or tell how big the sails must be.

But when steam is to be used the Government steps in and says the boiler shall be made so and so; a certain number of pounds of steam may be carried and no more; an engineer licensed only after examination by U. S. officers; and a pilot licensed only after examination by U. S. officers, shall be on board, otherwise you can't have a steamboat, and you must heat up or run aground only according to rules laid down rigidly.

Seriously, why shouldn't a man have a steamboat for his own pleasure, the engine of which he can run himself if he chooses, provided he does not use the boat to carry passengers for hire. The licensed engineer and pilot are personages whose salaries alone far exceed all other expenses of a small steam yacht, for occasional use. Yet they are imposed upon the owner by law, and he cannot use his boat without them.

The consequence is that comparatively few small pleasure steamers are built or used. Very small ones, like little launches, are sometimes overlooked in the matter of engineer and pilot, but a boat 30 or 35 feet long is always "inspected" and fees paid. It would seem that after the Government safety valve—locked—is put on, no further interference on the part of U. S. officials is needed.

NOTES FROM TUCSON.—Our correspondent in Arizona, W. H. Seamans, sends us the following notes of interest from Tucson: The country is rapidly filling up with strangers, drawn hither by the reports of the richness of our mines. Several important mining properties have recently changed hands. Among the purchasers I notice Tom Farish and the Hon. J. K. Luttrell of California. Mark McDonald is now here examining mines. I have just came in from the new mining district called the Empire, on the northeast end of the Santa Ritas. Mines are now being opened there which will soon make a stir. The weather is delightful; cool nights and bright, sunny days.

THE town of Red Rock, Pa., in the oil regions, was recently almost consumed by fire. Three hundred families were burnt out and are rendered destitute. The loss of property will amount to $200,000. During the burning the fire communicated with a 25,000 barrel oil tank. Rivers of oil flowed down Valley and through Main streets of Red Rock, burning all the business and private houses in the town.

THE appraisers of the estate of the late W. S. O'Brien place its value at $9,655,459.37.

CORRESPONDENCE.

We admit, unendorsed, opinions of correspondents.—EDS.

Salt Marsh Reclamation.

EDITORS PRESS:—Having been invited to visit the reclamation works of the Novato salt marshes, comprising nearly 5,000 acres, we went thither and spent two days investigating the whole area, with its systems of levees, flood-gates, ditches, irrigating canals, etc., and think the whole scheme of sufficient interest to be made the subject of a communication to your valuable paper.

The Novato meadows, as they are called to-day, lie about 11 milee north of San Rafael, in Marin county. The owner of these meadows ie John W. Ferris, Esq., a civil engineer but recently from England, but who has already earned a well-deserved reputation for skill, through the successful reclamation of Roberts island, near Stockton. This island has an area of 60,000 acres, and is to-day entirely under cultivation.

The reclamation works of the Novato meadows have been very intelligently planned by Mr. Ferris, and carried out with skill and economy by Mr. J. B. Christensen, assistant engineer, to whom the whole work has been entrueted.

The levees are 23 feet wide at base, 9 feet at top and 5 feet high. They are built with the compact salt-marsh soil, which renders them l iable to ugly cracks in the dry summer months; but Mr. Christensen has had the happy idea to harrow them over several times, until the soil was thoroughly pulverized, and to-day not a eingle crack has manifested itself. This is a real improvement in levce building.

Twelve hundred acres have been plowed and immediately rented to eager tenants. The first crops on properly reclaimed salt-marsh land are very heavy and of excellent quality. Ladd's Sonoma meadows produced harley, bringing 10% more at the breweries than the good commou brewers' market barley.

We really wish that our California capitalists would invest some money in the development of the real resources of California, instead of following so closely the narrow arts of the money lender. A. V. D. N.

San Francisco.

Machine for Harvesting Cane.

EDITORS PRESS:—There have been several pieces in the papers lately in regard to raising eugar cane; but it can never be very profitable in this State until eome meane other thau by hand are devised to do the harvesting. To attain that end I propose to make an assignment (for nothing, to any one who will complete it) of all my right to a contrivance that will serve that purpose, which I have not the money or time to perfect. A model of this invention may be seen in your Patent Agency Office, and some of your readere may remember seeing a notice of it a little over a year ago.

JOHN HOWELL.

Anderson, Shasta Co., Cal.

Mines in the East.

The New York *Mining Record* of receut date has the following sensible remarks about placing mining property in the East:

We fancy that there is very much more difficulty in gulling the people, here in the East, into investments in worthless mining enterprises, than some of our contemporaries of the mining districts of the country seem to suppose. Here and there, occasionally, persons may he found so credulous as to make a purchase of a hundred shares in some worthless scheme; but, as a rule, there is exceeding difficulty in getting people to adventure their money, at times, even in really good mines, upon the most favorable reports of highly esteemed mining experts. Our city is being actively exploited, we know, by mine owners, hut for one successful sale of a property, there may be counted more than fifty failures, including very many mines having the highest testimonials to their intrinsic worth. In very few cases can capitalists be found willing to take hold, single-handed, even of a mine of thoroughly demonstrated value. Such mines are generally placed by subscriptions taken by hnndreds of iudividuals. We think the practical plan for any one having a mining property of genuine worth, is to have it examined and reported upon hy some mining engineer of unquestionably good reputation, explicitly as to the precise extent and character of the work done in developing the property; the precise nature of the mineral resources visible and known to exist, with such details of elements of prospective profit as any reputable expert would venture to authenticate with his signature. Any effort to sell or place a mine in the East with less satisfactory evidence than this, is destined to end in utter failure.

Meanwhile, our contemporaries in the mining region, particularly in Colorado, may do good eervice hy promptly exposing the facts about any mining claim which they may know to be falsely represented here in tbe East.

Metallurgical Processes in Montana.

The New York *Tribune* some time ago, sent Mr. Z. L. White through the mines of Colorado, he Black Hills, Montana aud Utah. Mr. White's description of the processss employed by a company in Montana is so clear and comprehensive as to the methods employed for treating silver-bearing ores, that we deem it worthy of publication. Mr. W. says: "I may prsmise that smelting ores, which nesd only to be desulphurized in a reverberatory furnacs, and milling ores, that need only to be desulphurized and chloridized are not to be put through the 'Krom' mill; all others are to be treated by the process I am about to describs. The ore, which, as it comes from the mine, is mixed with rock or gangue, is first put into a rock-breaker similar to those used in all quartz mills and for breaking stones for paving streets, and, after being broken into emall pieces, falls into an inclined drying shaft, in which the moisture which it contains is removed. From this it is discharged upon a set of steel-rimmed 'Krom' rolls, between which it is crushed into pieces from one-fiftieth to one-tenth of an inch square. From the rolls the ore falls into a revolving screen, hy which it is separated into two eizes; that which is already crushed fine enough is taken to the top of the mill by means of an automatic elevator like that used for loading and unloading grain, and that which is too coarse is taken hy similar means to the next floor above, where it is delivered upon another set of rolls set closer together, and after passing through them is also taken to the top of the mill by an elevator.

"The ore is then separated into fonr different sizes by passing through a series of revolving screens, and each size is delivered in a separate bin. The next step in the process is the concentration of the ore—that is, the separation of the ore from the gangue or waste rock. Thie is accomplished by means of a simple machine, similar in the principle of its construction to a middlings purifier, used in the improved methods of manufacturing flour. As the rock, which is now of the consistency of fine gravel, falls from the bin which contains it into the concentrator, it is fed upon a fine wire network, through which a strong blast of air is forced in puffs following each other iu quick succession. This blows the whole mass a short distance into the air, but the gangue, heing much lighter than the ore, goee a longer distauce and falls in a heap by itself, while the ore falls into a receptacle provided for it. The advantage of this concentration is that the bulk of the rock subsequently to be treated in the smelter, the battery, or the amalgamating or leaching-pan is reduced, often as much as 50% or 75%, and the cost of handling it thereafter is correspondingly less.

"After passing through the first concentrator the gangue has been in great measure removed, but the different classes of ore are all together. Some of it, containing 20% and upward of lead, is best treated by smelting; that containing less than 20% of lead or averaging not more than 5% or 10% may be amalgamated, and that carrying less than 5% of lead, leached. It is desirable, therefore, to separate the ore into three grades according to the proportion of lead which it contains, and this is done by means of other concentratore like that I have already described.

"The greater the proportion of lead which an ore contains the heavier it is, and the machines are so regulated as to deliver the emelting ores separately from those that are to be leached or amalgamated, and the last two classes are afterward separated from each other in the same manner. The working of the concentrators, of course, causes great clouds of dust, but above each is placed a hood connected with an exhaust-fan, which collects the dust and delivers it in a dust-room to be amalgamated or leached. The whole process I have thus far described is automatic; the ore passes from one machine to another without the intervention of workmen from the time the large pieces of rock are fed into the breaker nntil it has been concentrated aud separated. At different stages in the process, the ores are weighed, and a record of them is carefully kept.

"Let us now follow the smelting ores. These are taken in cars to the reverberatory furnaces, where they are desulphurized simply by heating. They are then mixed with iron ores that have also been desulphurized in the eame manner, and which are added to form a flux which shall carry off the gangne that may remain mixed with the ore. This is then melted in an ordinary 'water-jacket' smelting furnace, with coke or charcoal. The lead and silver, being heavier, sinks to the bottom; is collected in a small reservoir on the outside provided for that purpose, from which it is dipped and cast into bars of base bullion. The flux, consisting of iron and melted rock, is drawn off through an opening in the side of the furnace above the melted hullion. The hase bullion may be refined, that is, the lead separated from the eilver, either at the works where it is produced, or in the East where it is sold.

"Ores that are to be amalgamated, that is, those which contain from 5% to 10% of lead on an average, are first taken to a stamp mill, where they are reduced to fine dust in a battery similar to that used for reducing gold ore, except that no water flows through the battery. It is then placed in a 'Bruokner' cylinder, an immense irou cylinder six feet in diameter and twelve feet long, through wbicb a flue passes, wbicb, connscted with a furnacs, heats the contents of the cylinder. This is then caused to revolve slowly, and the heat separates the sulphur from the ore. After this, common salt equal in amount to about 6% of the contents of the cylinder is added, ths heat increased, and the silver which the ors contains is thus chloridized. This silver which the ors contains is now in such a condition that it has a strong affinity for quicksilver, and the pulp, agitated in an amalgamating pan with mercury and water, gives up its silver, which is collected in the form of amalgam on the bottom. The silver is afterward separated from the mercury by simply retorting it.

"The leaching ores, that is tbose which contain less than 5% of lead, are crushed in the stamp-mill, desulphurized and chloridized in the 'Bruckner' cylinders exactly as the amalgamating ores ars. Then, after being cooled, they are placed in an agitator with a hot eaturated solution of common ealt in water, which takes up and holds in euspension the chloride of silver which the ore contains. The liquid is then drained from the pulp, and the chloride of silver is precipitated upon strips of copper, over which it is made to pass. The chloride of copper which the brine takes up is afterward precipitated upon iron and the solution of salt is used again. Finally the chlorine is separated from the metallic silver by means of heat. Thie ie known as the 'Augustine leaching process.'

"From this brief description it will be seen that the process of reducing the refractory ores of Montana is a very complicated one, requiring skill and expensive machinery. If the owner of a mine yielding galena ore erects a smelter on his property like the smelters in which the Leadville oree are treated, he must add reverberatory furnaces, and even then can extract only a part of the silver which his rock containe. If he builds a stamp-mill and attempts to save the metal by amalgamation, he must chloridize his ore by the use of 'Bruckner' cylindere or some other similar machinery, and even then will fail to save all his silver. But when all the processes are combined and worked intelligently and economically, the most satisfactory results are attained."

Re-working an Old Mine.

The *Butte County Register* hae the following to say about the old Banner mine: This mine, situated about six miles from Oroville near Oregon gulch, after laying idle for 20 years has again been put in working order, and the first clean-up hae shown that the mine has not gone back on its former reputation, the clean-up for the first five days' work amounting to $3,500. The hietory of this mine dates back to the flush daye of mining in California, 1850. It was located by a company at that time and prospected to a limited extent and purchased from the original locators in 1852 by Messrs. Smith & Sparks, of Oroville. A shaft was sunk in 1853. While sinking the shaft the rock taken out was crushed hy a epring pole mortar, wheeled to French ravine a sbort distauce off and washed out, yielding $500. The prospect was so encouraging that four arastras were constructed and worked by horses for about a year, when a 12-etamp mill was built and run by water during 1854. The water supply giving out in the early part of 1855, four arastras worked by steam were substituted. In the meantime a tunnel was being run to tap the ledge at a greater depth. The tunnel was finished in 1856, and a 12-stamp eteam mill erected and worked continuously until 1859, yielding during the time it was worked $600,000, when, owing to the lack of care in timbering the drift, a cave took place, burying two men whose remains were found upon the re-opening of the mine some months since after remaining buried for just 20 years. The extent of the original Banner mine was 3,300 feet. Extensione upon the ledge were located during the working, called the Southern extension and the California. These, with the Amoskeag and Coffee & Clark, two parallel ledges, making three which were located and afterwards consolidated with the Banner and a patent obtained under the name of the Minerva mining company. Arastras were put to work in the California ledge in 1855, and a thousand tons of rock crushed, yielding $27,000. While a large amonnt of money was taken out of the Banner mine, the little knowledge posseesed at that time about working quartz mines, labor at $8 per day; lumber $125 per thousand feet; nails $25 per keg, and the extravagant habits of the times found the owners, when the cave took place, without means to re-open the mine. It subseqnently passed into the hands of Joeeph Trench, of San Francisco, and was held by him nntil about a year ago, when he entered into a contract with Kearney and Taylor, of San Francisco, to re-open the original Banner mine 3,300 feet and put everything in working order for one-half the property. The clean-up last week shows not only that they have filled their contract, but that they have got a valuable piece of property. About the time of the death of Mr. Trench, which took place a short time ago, Mr. Smith, one of the former owners, re-purchased Mr. Trench's interest, which makes him the owner of one-half the Banner proper, and sole owner of the extensions, the California and the Coffee & Clark ledges, for the opening of which, we are pleased to learn, Mr. Smith has secured all the necessary capital. The opening of these mines mnst, in the ordinary course of business, contribute largely to the support of Oroville, and be the meaus of attracting capital to other mines in the county.

The Old Inyo Mines Coming to the Front Again.

After a lapse of many years some of ths oldest mining camps iu Inyo county are beginning to show signs of returning animation. In a lats number of the *Independent* we notice that considerable quantities of the precious metals are being extracted from regions long sincs abandoned and considered worthless. We notice, for instance the old Coso mins, situate westerly from Darwin some nine or ten miles, and long since supposed to have been worked out, has again donned the garb of activity, and where but a few years ago a few ragged Mexicans eked out a scanty subsistence with a small arastra or two, there are now fourtesn in full running order, and all producing gold. This is one of the firet camps established in the county, and as early as 1861 was worked, but when the Indian troubles began the miners were forced to leave. Some fabulous stories have been told to the writer hereof of rich gold quartz float having been found in the foothille of the old Coso range, many of which were doubtless true. The country has never been thoroughly prospected by white men; in fact, it ie not an easy place to prospect in, as water is very ecarce and difficult to find. Beveridge district ie situate in the White mountains southeasterly from Independence. Although but a newly discovered district, Beveridge is also yielding up her quota of wealth. A few Mexicans with five small arastras are taking out as high as $1,200 per week. Besides this Messrs. Porter, Hunter & Co., the original discoverers, have erected substantial worke which are paying well. Then the old mines worked by McMurray & Co., years ago, have been put again in working condition by John Kelley, Chas. Schuman and others, and are now paying largely. Billy Lake, who opened the first stock of goode in Pine City, has a ledge which is said to be very rich. The Hitchcock boye have also a good paying gold lead, and there are many others which, if hut thoroughly prospected, could be made to pay well. These are but a few of the many that could be mentioned. The rich silver, lead mines and gold leade of Cerro Gordo, and the late rich finds uear Swansea, in fact the whole country to the east and south of Big Pine and Independence, preseuts a field for the industrioue prospector and miner tbat cannot he surpassed on the western slope of the Sierras. The climate cannot be excelled. Water and wood in most places are abundant, plenty of fruit in season and the necessaries of life for both man and beast can be obtained at little cost. The only one thing needful now is pluck and energy on the part of the prospector and miner, and the assistance of the generous inhabitants of the valleys, to make Owen's River valley one of the richest garden spots of the Sierras.—*Mammoth Herald.*

The Ivanpah Mines.

The new developments in these mines and the new impetue given to the work by the recent organization of the Consolidated Company, is attracting attention in mining circles, and in etock reporte thcy are very favorably considered. Among the stock notes of one of the city dailies, we find the following:

Among new dividend propositions of the outside which will be listed at the San Francisco Board, ie the Ivanpah Con. mine, one of the most meritorious properties in southern California. This mine is located on Alaska hill, Clarke's mining district, county of San Bernardino. It is only 11 milee from the boundary line of the State of Nevada, and about five miles from the company's mill and the cuetom mill. The Ivanpah miue is well situated for working purposes, and can be developed to the depth of 400 to 500 feet by tunnels running on the ledge. The old workings show a well-defined fissure ledge in dolomite limestone from east to west to the extent of at least 2,500 feet. The greatest depth hitherto attained is about 250 feet, and, although the mine has been worked from nearly one end to the other, in no instanco has the ledge shown any signs of giving out. On the contrary, it is more clearly defined in the lower levels. There are, commencing at the west end, 10 chutes of ore, and toward the eastern end a continuous chute of about 300 feet. Thus far, however, only surface work has been done, and it remaine to be seen what additional depth will disclose. The superintendent is now sinking a shaft from an old tunnel which is about 75 feet from the surface. The shaft is down about 60 feet, or from the surface 135 feet. The ledge is found to increase in size and richness at the hottom. The ore taken from this shaft is divided into two classes. The first clase ore milled at the company's mill $1,110 per ton, and the second class ore milled $340.50. There are two railroad tunnels, besides several smaller ones, showing over 200 feet of stoping ground. The water right belonging to the Ivanpah mill is the best in the camp, and the road from the mine to the mill is good. Robert Sherwood and other capitalists of this city have hought a controlling interest in this valuable property, and under their energetic management we expect it to eoon take its place among the reliahle dividend-paying stocks lieted at the board.

Mr. Will. A. McFarlane has charge of the company's work, and has gone to Ivanpah to commence active operations, putting in new machinery and preparing for a vigorous prosecution of the work of getting out the precious metals.—*San Bernardino Index.*

MECHANICAL PROGRESS.

Quantity of Heat Utilized in the Steam Engine.

At a recent meeting of an Association of Engineers, in Liverpool, England, Mr. Emerson Bainbridge read an interesting paper on the details of an experiment made to ascertain the causes of the difference between the quantity of heat in fuel and the quantity which is utilized in the work done by a steam engine. He said that the most economical mode of producing and using steam power formed a question of special interest at the present day for engineers, this leading to the problem as to the scope that might exist for the utilization of the large margin of loss in the difference between the heat contained by the fuel and the small percentage of such heat which is represented by the work actually performed by a steam engine. Only 11% of the actual heat power contained in the fuel was utilized, and though a large proportion of that loss could never be overcome, the importance of the inquiry was evidenced by the fact that every 1% gained, means in the consumption of this country alone, a saving of about half a million tons per annum. About 50,000,000 tons were annually used in the production of steam, which was about 37% of the whole output.

The coal used in dwellings, great as was the waste, was more fully utilized than when it was used in any other way, thus 13% of the heat actually possessed by fuel was given off in an open fire-place. As an instance of the small amount of heat utilized, it was stated that to produce three pounds of steel seven pounds of coal were required. The author then gave the results of an experiment he had made with the winding engine and boilers of a small colliery, each plan being nearly 30 years old. Some of the improvements which might be made with a view to promoting economy of fuel, were the fixing of boilers of an improved construction with a minimum thickness of plates and a maximum area of heating surface. Special attention should be paid to the manner in which air is admitted to the fire, and to the working of the damper. The air intermingled in the fire-grate should be so intermingled with the gases from the fire as to enable a minimum quantity of air to be used. The application of such form of fire-grates and such mode of firing as will enable the cheapest quality of fuel to be used; the complete covering of all exposed hot surfaces; where water is scarce the application of the best form of water heater; where water is plentiful the adoption of an improved form of condenser; steam jacketing of the cylinder, and mechanical accuracy in the construction of the engine; the application of the system of variable expansion when the work done by the engine varies; in case of winding engines, the adoption of drums of varying diameters; as a general principle, the use of steam at a high temperature in order to have the greatest possible difference in temperature between the steam when it reaches the cylinder and when it has done its work.

In the application of such improvements to ordinary steam engines, the saving in working cost must, of course, first be considered, and in the adoption of all such means of promoting economy, as have been alluded to, it may be confidently asserted that the saving in working cost will, as a rule, wipe off the extra first cost incurred in a very short time, since the saving effected will probably vary from 50% to 150% per annum on the first cost.

Auxiliary Governor for Engines.

A new governor has been invented by Mr. John Milton, of Hamilton, Va., which consists in arranging a lever, or other movable device, in such relation to the main or driving belt of the engine that, when the slack of the belt is taken up by the reason of the increased tension thereon (due to an increased load being thrown on the engine), said lever or device will be depressed or changed in position, which will (through suitable connecting mechanism) raise a valve located in the steam passage, and thereby open the latter and allow freer admission of steam to the engine, so as to instantly increase the power of the latter and prevent diminution of speed.

The operation of the auxiliary governor is as follows: When the engine is running without much change in the load or draft, the ordinary governor controls its action by regulating the admission of steam; but if the load is considerably and suddenly increased, the engine will be at once slackened, because the ordinary governor will not act quickly enough to instantly open the valve and thus allow admission of the full head of steam to the piston-cylinder, for the purpose of counteracting or opposing the tendency to retardation of velocity. This function is performed by the auxiliary governor in the following manner: When the increased load is thrown on the engine, the rotation of the power shaft is diminished proportionately, so that the lower half of the belt will be thereby suddenly subjected to increased tension and drawn taut, while the other half will be simultaneously slackened. The short arm of the lever is thus depressed and its weighted end raised, and the arm attached to its fulcrum thrown over to the left, so that the pinion or rock shaft is rotated a part of a revolution, and the valve thereby raised from its seat. This movement of the valve opens the branch and allows free admission of steam to the steam-chest. The increased pressure of steam in the cylinder instantly adds to the power, and tends to accelerate the speed of the engine. This occurring coincidently with the application of the increased load, the tendency to retardation of velocity is overcome, and hence the speed of the engine is maintained undiminished.

It is obvious the sensitiveness of the auxiliary governor may be increased or diminished by shifting the weight along the lever, since this will increase or diminish the pressure of the friction roller on the belt, and thus cause an increased tension of the latter to vibrate the lever—that is, affect its position more or less quickly.

Steel Castings for Machinery.

Among the engineering exhibits at the late International Agricultural exhibition at Kilburn, England, one of the most interesting alike to the metallurgist and the machinist, was a collection of steel castings produced at Newburn-on-Tyne by Messrs. John Spencer & Sons. As illustrative of the various applications of steel to the purposes of machinery, this extensive collection was most instructive, especially at the present time, when steel is daily asserting its claim to be considered "the metal of the future," and when the demand is increasing for machinery at once light and strong, and capable of resisting a great amount of wear and tear. The articles exhibited by Messrs. Spencer were of the most varied form and application, including spur-wheels, pinions and geared wheels of all kinds, rings of gear and winding drums for traction and for steam plows, wheels and sheaves for collieries, mines, etc., solid-disc railway wagon wheels, crank-axles, brackets, rollers, clutches, axle-boxes, hydraulic cylinders, together with a great variety of engineering castings, projectiles etc., the specimens shown varying in weight from 10 lbs. to 30 cwt. each. All the castings displayed remarkable soundness, those made from steel of the milder qualities possessing a very great degree of toughness, some of the test pieces being capable of bearing a tensile strain of 30 tons per square inch, with a elongation of 25% before fracture. Such a material is well suited for any work having to withstand sudden strains, or where a high degree of ductility is required. The harder qualities which stand a tensile strain of from 40 to 50 tons per square inch, with an elongation varying proportionately from 15% to 3%, are applicable to various uses, according as greater resistance to abrasion, or more or less ductility is required. It is the remarkable capability that steel possesses of being thus varied in hardness and toughness, which constitutes the immense value of that metal for the purposes of the engineer and machinist, and which has already caused it to displace cast-iron in so many constructions. Messrs. Spencers' exhibit served in an admirable manner to demonstrate the capabilities of cast-steel, and promises well for the future development of this important branch of manufacture.

The Transmission of Power by Belting.

The results of an extensive series of experiments on belts and belting have been published in France by M. Leloutre, in the Transactions of the Societe des Ingenieurs Civils. The subjects examined were the elongation, elasticity and breaking strain of driving belts made of leather, india-rubber, webbing and canvas; and the slipping of belts and cords. Some practical applications made of these results in the transmission of power by belts, are also given.

The experiments on elongation, elasticity and breaking strain were made by cutting from any leather belt, or from the hide, a strip about 30 inches long and two to two and a half inches wide, which was further subdivided into three or four narrower thongs, for testing in different ways. Two fine lines were marked across the thong, at a distance of 20 inches apart: and the width and thickness of the thong were carefully measured at several intervening places, to determine the corresponding transverse sectional areas, the minimum of which was taken for calculating the strains. Any probable errors involved in the results so arrived at did not exceed two per cent.

The general results of the experiments on leather, india-rubber, webbing and canvas are that the elongation produced by a tensile strain is in no respect proportional to that strain, but increases always less rapidly than the tension; in other words, the modulus of elasticity for these materials rises higher and higher as the load increases, while for metals it falls lower and lower. One curious fact, however, which the experiments disclose is that, while the elongations or successive increments of length become less and less up to a certain load, they then become greater and greater, showing a point of maximum power of resistance, which is then followed by a falling off; after this decline of resistance, the elongation again becomes less rapid up to the breaking strain, on approaching which the resistance is generally greater. In ordinary leather the maximum resistance to stretching is met with at a strain of about 850 pounds per square inch; in india-rubber and webbing it occurs at rather a lower strain. It is evidently advantageous, therefore, that the working strain on a belt should be fixed as near as possible to that at which the maximum resistance to stretching occurs, or say from 700 to 800 pounds per square inch. This is largely in excess of the tension generally recommended of 200 to 300 pounds per square inch, which itself is even regarded with timidity by many engineers. Should the point of maximum resistance to stretching be accidentally exceeded by the strain in working, no trouble will be experienced. This is owing to the fact, demonstrated by experiment, that the elasticity of leather and webbing is perfect; for when thongs have already been twice torn asunder, the severed shreds, after having been stretched one and a half inch per foot, have been found with fifteen months' rest to recover exactly their original length.

Automatic Fire Lighter.—A novel device for lighting fires automatically at any prescribed time has recently been patented by Mr. E. H. Dorcher, of Homestead, Iowa. It is intended for the use of housekeepers, country school teachers, manufacturers, and others, who require a fire at a stated time. When this device is used personal presence is not required; all that is necessary is to prepare the kindlings and fuel beforehand and set the apparatus. The mechanism is controlled by a clock, upon the hour hand arbor of which there is an adjustable disk similar to that of an alarm clock, which carries an arm capable of engaging pins projecting from the periphery of the wheel, which carries seven pins corresponding with the seven days of the week, and arranged so that they may disengage a pawl from the ratchet wheel at any prescribed time in the day. The ratchet is upon the shaft of a small windlass that is propelled by a weight when the pawl releases the ratchet wheel. This windlass winds a cord that may be extended in any direction to the stove or furnace where there is a lighter, consisting of a horizontal wheel, around the periphery of which is wound the cord from the windlass, and upon the upper surface of which there is a coating of sand or sand paper. The wheel is protected by an iron cover, which also supports a clamp for holding one or more matches, so that they press lightly upon the sanded surface. A piece of paper or other combustible material extends from the match to the kindlings in the fireplace. The operation of this apparatus is obvious. At the prescribed time the pawl is released, the weight drops, the sanded wheel revolves, and the fire is lighted. If it is desired to skip a day or so, the pins in the wheel, which represent the days to be skipped, are removed.

SCIENTIFIC PROGRESS.

Proposed Method for Dissociation of Metalloids.

Much thought has of late been given by chemists and physicists to the possibility of decomposition of the substances that have been called elementary. Some phenomena of solar spectroscopy, taken along with the fact that solar temperatures are vastly higher than any realizable in the laboratory, seem to indicate that our ideas of the so-called elements may require considerable modification. There is reason to think that the metalloids, with the exception, perhaps, of oxygen, are dissociated in the sun. The well-known physicist, M. Raoul Pictet, has been pondering the possibility of dissociating them experimentally and by means of solar radiation. Guided by theoretical considerations (which are given fully in a recent number of the *Archives des Sciences*), he has proposed a method, which he thinks might prove successful; unfortunately, he is not in a position to realize it himself. The method is briefly as follows:

The sun's rays should be concentrated by a large parabolic mirror of silvered copper with about 10 meters' aperture; the weight need not exceed a ton and a half, and the mirror should be mounted so as to follow the sun's course. The total radiation would converge on a circular surface about 8 to 10 centimeters in diameter, giving about 1,000 calories a minute. Here M. Pictet would provide a "solar chamber" to receive the metalloid to be acted on by the concentrated heat which would be available after loss by radiation and conduction through the support. The solar chamber should be of nearly spherical shape, hollow and about one meter in diameter; one-half, directed to the sun, being of zirconium or lime (the most resistant substance known); the other half, directed towards the interior of the minor, of hard glass, with curvative calculated to favor the passage of the solar rays converging to the center of the chamber. The zirconium or lime should be heated exteriorly by an oxyhydrogen blowpipe, to diminish the loss of heat by radiation. Through a zirconium tube in the top of the chamber, vapors of the metalloids (chlorine, sulphur, bromine, iodine etc.,) should, by force of suction, be made to pass downwards through the zone of *maximum* temperature; and here a dissociation might be hoped for. One of the new vapors formed would pretty certainly diffuse into the surrounding space more rapidly than another. To fix this element and keep it from recombination, M. Pictet, would provide, in the lower part of the chamber, a wide metallic tube with a cooling envelope of liquid sulphurous acid, and a series of pieces of metallic netting with fine meshes, through which the vapore of the chamber should be drawn off. By exact analysis before and after insolation, new elements might be looked for. It is, of course, impossible to say in what state they might be condensed or crystallized; but in any case, by continuing the experiment some time, enough of the substance might be collected to allow of its properties being studied.

Steam Jet Signals.—Considerable attention is being drawn to the utilization of the steam jet as a medium for conveying signals to a great distance. It is well known that when a strong ray of light is thrown upon a jet of steam issuing forth into the darkness, the steam becomes brilliantly illuminated, and the light thus transmitted is visible from long distances. The example of this, frequently seen in steam issuing from a locomotive engine at night, when the driver opens his fire door, has not been lost, for, taking advantage of this principle, M. Carl Otto Ramstedt, late of the Russian navy, has devised a system of night signaling on board ship, with which some experiments have recently been made by the Trinity Board. The apparatus consists of a dished chamber, in which the inventor burns strontium or other substances so as to produce a variety of colors if desired. At the back of the chamber is a reflector, by means of which the light is thrown on the steam either steadily or in flashes at will. The steam thus becomes a luminous mass, varying in color with the substances used in combustion. The result of the experiments recently made showed it to be very effective and applicable to its intended purpose, and there appears to be little doubt that it will prove of value as a means of signaling at sea.

Chemicals the Measure of Commercial Prosperity.—Prof. Roscoe, in a late lecture on technical chemistry, remarked that the commercial prosperity of a country may with great accuracy be estimated by the amount of sulphuric acid it consumes. This will readily be acknowledged as true when it is borne in mind that there is scarcely an important branch of industry which, directly or indirectly, does not need to employ sulphuric acid for carrying on some of its processes, and when you learn that the result of this universal demand is that no less than 850,000 tons of sulphuric acid were manufactured in Great Britain in the year 1875, whilst this enormous amount is likely steadily to increase. By far the largest portion of this acid is employed in the manufacture, from common salt, of the alkali soda in the different forms, the remainder serving to carry on an endless variety of trades, amongst which those of the artificial manure maker, the gold and silver refiner, the candle maker, the dyer and bleacher, the calico printer, lucifer-match maker, the wire drawer, the galvanizer, and the color maker may be mentioned as some of the more important.

Electricity.—A paper by Dr. Warren De La Rue and Dr. Hugo Muller, on the electric discharge with chloride of silver battery, 11,000 cells, was recently read at the Royal Society. The authors find that for all gases there is a *minimum* pressure which offers the least resistance to the passage of an electric discharge. After the *minimum* has been reached the resistance to a discharge rapidly increases as the pressure of the gas decreases. When the discharge occurs there is a sudden expansion of the gas, in addition to and distinct from that caused by heat. This expansion ceases instantaneously when the discharge ceases. The appearances presented by the electric arc in air, hydrogen, carbonic acid, etc., are extremely beautiful. It is shown that the electric arc and the stratified discharge in vacuum tubes are modifications of the same phenomenon. These and other effects will be exhibited at the Royal Institution in the ensuing season by means of a new battery of 11,000 cells, which Dr. De La Rue is putting together.

Artificial Coloring of Flowers.—Professor Sachardo, of Padua, continues his interesting experiments of artificially coloring the corolla of flowers. There is nothing new in the plan, but the matters employed are original. He simply causes to drink certain colored solutions—aniline chiefly, which penetrating the tissues, modify color—in fact dye the nervelets and veins of the corolla. Gardeners, are aware, that, by mixing iron filings with the soil around hortensias, the latter receive a blue tint. The roots of pansies and stocks, dipped in a solution of green aniline, become colored in their flowers in fifteen minutes. But the plant dies in the course of a week. Watering the soil with a colored solution does no good, as the earth absorbs the coloring material.

New Theory of Terrestrial Magnetism. The theory lately advanced by Profs. Perry and Ayrton, of Japan, to account for the magnetism of the earth, and which has provoked much discussion, is thus briefly summarized in the *Philosophical Magazine:* They find this cause in the revolution of the earth beneath the electrical charge, originally, and at all times present in the atmosphere. They prove that "if the earth be electrified, it must, from its very rotation, quite independently of all other bodies in the universe, be magnetic; and if it consists of a shell of iron, thick or thin, then that the law of distribution of magnetism produced by this electrical charge in mechanical rotation, between it and space would be sufficient to produce the necessary amount of charge."

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	Week Ending Dec. 4.		Week Ending Dec. 11.		Week Ending Dec. 18.		Week Ending Dec. 24.	
Alpha	10	8½	8½	7¾	9	8	7¾	6
Alta	4	3¼	3.45	2.90	3½	2.60	2¾	1.80
Andes	1	65c	70c	55c	70c	45c	35c	25c
Alps	....	....	....	....	....	....	....	....
Argenta	95c	85c	1	90c	1¼	1	1.05	95c
Atlantic	10c	5c	5c	....	....	....	....	....
Aurora Tunnel	....	....	....	....	....	....	....	....
Baltimore Con	....	....	....	....	....	....	....	....
Belcher	2.95	2	2	1.40	1.80	1	2¼	1.70
Belmont	1	80c	1.45	90c	85c	50c	80c	75c
Best & Belcher	18¾	14	13¾	10¾	11½	8¾	9½	7¼
Bullion	5¼	4.20	4.65	3.45	4.10	3.60	3.70	2¼
Bechtel	1¾	1½	1½	1.40	1.55	1.30	1.35	1¼
Belle Isle	2.65	1.85	1¾	1.40	1¾	1½	1¼	1.20
Bodie	10½	9½	9	8¾	9	8½	8⅞	8½
Benton	2.80	2.15	2	1.10	1¾	1.45	1.45	85c
Bulwer	10	9¾	10	9¼	9¼	8¾	9¼	8¾
Boyle	....	....	....	....	....	....	....	....
Black Hawk	25c	20c	40c	20c	50c	25c	50c	40c
Belvidere	60c	45c	1	60c	1½	90c	60c	50c
Booker	85c	75c	70c	55c	70c	50c	50c	30c
Caledonia	1½	1.05	1.10	50c	1.40	90c	1.30	70c
California	4¾	3.70	3.85	3¼	4.40	3.80	3.95	2.70
Challenge	2.20	1.80	1.80	1¼	2	1.55	3¼	1½
Chollar	8	7	6¾	5¾	6¾	5¼	5¾	4½
Confidence	9½	7	7	5½	8	6¼	7	6
Con Imperial	70c	55c	60c	50c	60c	35c	40c	25c
Con Virginia	5¼	4¼	4.95	3¾	4.70	3.95	3.90	3
Crown Point	2.60	2	1.80	1½	2	85c	2	1.45
Con Washoe	....	....	....	....	....	....	....	....
Champion	30c	25c	30c	20c	20c	15c	20c	10c
Concordia	40c	20c	25c	15c	25c	20c	....	....
Dayton	....	....	....	....	....	....	....	....
DeFrees	....	....	....	....	....	....	....	....
Daney	....	....	....	....	....	....	....	....
Day	1.10	1	1.10	70c	1	80c	95c	70c
Eureka Con	19	16½	24½	17¾	19½	15¾	17	16
Exchequer	4	3.40	3.40	2.60	3.10	2¼	2¾	1½
Endowment	75c	70c	80c	75c	75c	70c	65c	60c
Gen Thomas	....	....	....	....	....	....	....	....
Grand Prize	1	25c	1	70c	75c	30c	50c	30c
Gila	35c	20c	25c	20c	20c	15c	15c	5c
Golden Chariot	....	....	....	....	....	....	....	....
Golden Terra	13	12½	12½	12	12	10	12	....
Goodshaw	20c	15c	20c	5c	10c	....	10c	5c
Gould & Curry	8¾	7½	7	5½	5¾	4	4½	3¾
Hale & Norcross	14½	11	9¾	7¾	8½	5¼	6½	5
Hillside	1.10	1	1.10	1	1¾	85c	1¾	85c
Highbridge	....	....	....	....	....	....	....	....
Homestake	....	....	....	....	....	....	....	....
Hussey	....	....	....	....	....	....	....	....
Independence	80c	70c	60c	40c	75c	....	60c	75c
Julia	1.95	1.20	1½	80c	1	50c	1.60	50c
Justice	2.35	1.60	1.80	1¼	1.40	1	1	60c
Jackson	....	....	3½	....	4	3½	3½	....
Joe Scates	....	....	....	....	....	....	....	....
K K Con	4	3½	4½	4	6	4½	5¾	4½
Kentuck	3½	3	3	2.60	3	2½	2¾	2½
Kossuth	15c	....	....	....	10c	....	....	....
Keystone	....	....	....	....	....	....	....	....
Lady Bryan	50c	25c	40c	25c	35c	25c	20c	10c
Lady Wash	80c	50c	70c	50c	60c	45c	50c	30c
Leopard	25c	....	15c	5c	15c	....	10c	5c
Leviathan	30c	25c	30c	20c	50c	25c	30c	20c
Leeds	50c	40c	40c	...	55c	40c	40c	....
Lee	....	....	....	....	....	....	....	....
May Belle	....	....	....	....	....	....	....	....
Modoc	....	....	....	....	....	....	....	....
Manhattan	2	....	1½	....	1½	....	1½	....
Martin White	1	80c	1¾	85c	90c	50c	60c	50c
McClinton	45c	40c	40c	35c	50c	35c	40c	35c
Meadow Valley	....	....	....	....	....	....	....	....
Mexican	24½	20	22½	18	20	16	17¾	15¼
Mides	....	....	....	....	....	....	....	....
Morning Star	....	....	....	....	....	....	....	....
North Con Virginia	10½	....	....	....	....	....	....	....
New York	45c	30c	35c	30c	35c	25c	25c	10c
Northern Belle	6¼	6	6¼	6¼	6½	5⅞	6½	6
New Coso	....	....	....	....	....	....	....	....
Navajo	30c	25c	30c	25c	30c	25c	25c	20c
Occidental	2	1¼	1½	85c	1	90c	50c	25c
Ophir	26¾	22½	25	21	21¾	18	18½	15½
Oriental	....	....	35c	5c	35c	25c	....	....
Overman	7	5⅝	5⅞	4¼	4⅞	3¼	3.70	2¼
Panther	....	....	....	....	....	....	....	....
Phenix	....	....	....	....	....	....	....	....
Phil Sheridan	25c	20c	25c	20c	25c	20c	20c	....
Potosi	4.55	3.60	4.05	2.60	3.65	2¾	2.90	2½
Prospect	....	....	....	....	....	....	....	....
Raymond & Ely	1	....	1	50c	1	75c	90c	70c
Richer	5	....	....	....	....	....	....	....
Rock Island	....	....	....	....	....	....	....	....
Rye Patch	....	....	....	....	....	....	....	....
Rough & Ready	....	....	....	....	....	....	....	....
Savage	10¼	7⅛	8	6⅛	7	4.05	4.80	3.85
Seg Belcher	16	15	13½	13	15	10	12	....
Sierra Nevada	39¾	39	34½	24½	28	20½	22	17
Silver Hill	1.35	1	1	65c	1	70c	80c	35c
Silver King	5	4	5½	4	4	3¾	6	5
Silver Prize	....	....	....	....	....	....	....	....
Succor	20c	....	....	....	....	....	....	....
Summit	1.10	80c	90c	60c	75c	50c	80c	50c
Scorpion	3.10	1.95	3¾	2½	2.95	2½	2.60	2¼
Solid Silver	35c	....	35c	....	20c	10c	20c	15c
South Bodie	25c	15c	15c	10c	25c	....	15c	10c
South Standard	....	....	25c	....	....	....	....	....
Star	25c	20c	20c	15c	20c	....	15c	....
St. Louis	....	....	....	....	....	....	....	....
Syndicate	3	2	3¼	2.20	2¾	2¾	1½	90c
Tioga Con	2¼	2	2	1.65	1.90	1.60	1¾	1¼
Tiptop	1¾	1.85	1.90	1.70	2	1.80	2	1¾
Trojan	10c	5c	5c	....	....	....	....	....
Union Con	61	45¾	57½	44¾	46	39	44	26½
Utah	16	14	13¾	10	12	9½	9⅛	6
Vermont Con	....	....	....	....	....	....	....	....
Ward	1½	1.20	1.30	1	1.30	1	1.10	50c
Wells-Fargo	5c	....	....	....	....	....	....	....
Woodville	20c	15c	15c	....	....	....	....	....
White Cloud	....	....	....	....	....	....	....	....
Yellow Jacket	13¾	11¾	10½	8¾	10½	8¼	9¾	6¾

Sales at S. F. Stock Exchange.

Friday A. M., Dec. 19.

600 Andes 25c
240 Alta 2½
10 Alpha 7¾
395 Belcher 1.90@2
330 Best & Belcher 9@8¾
255 Bullion 3.70@3.65
130 Benton 1.40@1½
550 Con Imperial 30@35c
395 Crown Point 1.90@1.85
470 Chollar 5¾@5⅝
120 Confidence 6½
380 California 3.95@3.90
280 Con Virginia 3.85@3.90
780 Caledonia 90c
750 C Dorado 1.05@1
1355 Challenge 1¾@1.80
100 Dardanelles 75c
20 Exchequer 2.55
410 Flowery 20c
250 Golden Gate 1.10
260 Gould & Curry 4.40@4¾
265 Hale & Nor 6@6½
50 Justice 90c@1
1250 Julia 60@50c
110 Kentuck 2.65
100 Leviathan 25@20c
490 Lady Wash 40@45c
1175 Mexican 17¼@17¾
335 Mackey 10c
300 Mountain View 1.10@1
1330 N Bonanza 25@30c
350 New York 25c
1025 Ophir 17½@18½
325 Overman 3½@3.70
510 Potosi 2.90@2.80
295 Savage 4.65@4¾
1230 Sierra Nevada 21@22
30 Seg Belcher 12
280 Silver Hill 60@70c
360 Scorpion 2.55
100 Solid Silver 20c
205 Utah 9@9¼
770 Union Con 42½@41
270 Ward 1.10
410 Yellow Jacket 8½@8¾

AFTERNOON SESSION.

300 Atlas 20c
520 Addenda 35c
1080 Argenta 1.05@1
400 Albion 40c
100 Bodie 8¾
280 Bechtel 1.35
150 Belle Isle 1½
300 Belmont 75c
100 Boston 1¼
50 Black Hawk 50c
300 Booker 50@45c
395 Bulwer 9½@9¼
600 Belvidere 60@50c
350 Champion 15@10c
120 Caledonia (BH) 2.80@3
75 C Pacific 4
690 Day 95@90c
350 Dudley 25c
750 Endowment 65@60c
160 Eureka Con 16½@16¼
200 Gila 15c
790 Grand Prize 50c
500 Goodshaw 5c
200 Hillside 90c
15 Independence 75c
540 Jupiter 1¼
105 K K Con 5¾@5¼
150 Leeds 40c
200 Leopard 10c
255 Mono 3@3¼
200 Martin White 55c
240 Mammoth 2
200 Navajo 20c
155 Noonday 4½
50 N Noonday 3.15
700 Orient 20c
330 Paradise 50@60c
540 Ray'd & Ely 60@75c
150 S Bulwer 50c
100 Star 15c
100 S Noonday 1¾
150 Silver King 5
150 Syndicate 1¼@1.20
395 Summit 75@80c
260 Tioga Con 1¾
400 University 10c
630 Wales 4@4¼
100 W Pacific 30c

Saturday A. M., Dec. 20.

120 Alpha 7½
580 Alta 2@2.10
550 Andes 30c
50 Argenta 1
200 Albion 40c
25 Addenda 35c
270 Best & Belcher 8@7⅞
870 Belcher 1.70@1¾
410 Bullion 3.10@2.90
395 Benton 1.20@1¼
200 Boston 1¼
500 Belmont 75c
25 Bodie 8¾
430 Belle Isle 1.40@1½
50 Black Hawk 40c
50 Booker 45c
395 California 3.80@3.90
415 Con Virginia 3.90@3.85
375 Chollar 4⅞@4½
510 Crown Point 1.60@1¼
770 Con Imperial 30c
215 Confidence 6
230 Caledonia 75@80c
110 Challenge 1.60@1½
100 Caledonia (B H) 2.80
500 Con Dorado 1
500 Champion 10c
20 C Pacific 4
100 Dudley 45c
400 Day 85@80c
320 Exchequer 1½@1.40
50 Eureka Con 16
695 Flowery 20@25c
350 Gould & Curry 3⅞
200 Golden Gate 1.05
70 Grand Prize 40c
100 Gila 5c
1290 H & Norcross 5@5¼
150 Hillside 85@90c
980 Justice 60@70c
520 Julia 1¼@1.20
130 Jackson 3½
50 Kentuck 2.65
50 K K Con 5¼
200 Leopard 10c
300 Lady Bryan 20c
50 Leviathan 25c
200 Lady Wash 40c
915 Mexican 16¼@15¾
50 M White 60c
200 Mackey 10c
150 Mount View 1@1.10
75 McClinton 35c
140 Mammoth 2½
200 New York 15c
500 N Bonanza 10@15c
210 Northern Belle 6@6¼
100 Navajo 20c
200 N Noonday 3
50 Noonday 4½
315 Ophir 16¾
90 Overman 3
40 Occidental 50c
200 Oro 5c
100 Phil Sheridan 20c
100 Paradise 75c
585 Potosi 2¾@2.60
290 Raymond & E 70@75c
410 Savage 4@4.05
555 Sierra Nevada 19½@19¾
400 Silver Hill 60@55c
20 Silver King 5¼
610 Scorpion 2.45@2¼
500 Summit 75c
80 Syndicate 1@90c
200 S Bodie 10@15c
100 Tioga 1¼
360 Utah 7¾@7
945 Union Con 26½@37
100 Ward 1
345 Wales 4@4½
500 W Pacific 35@30c
910 Yellow Jacket 6¾@6½

Monday A. M., Dec. 22.

150 Alpha 6½@6
860 Alta 1.80@2
35 Andes 25c
890 Bullion 2¾@2.45
500 Belcher 1.60@1½
435 Best & Belcher 7½@7¼
540 Benton 85@95c
120 California 2.95
100 Confidence 5¾@6
1120 Con Imperial 25@30c
350 C Dorado 35c
765 Crown Point 1.45@1¼
460 Con Virginia 3.65@3.55
100 Chollar 4¾@4.80
230 Caledonia 70@75c
920 Challenge 1.80@2
150 Dardanelles 75c
715 Exchequer 2@1.60
1700 Flowery 20@25c
200 Golden Gate 1.05
1105 Gould & Curry 3¾@4
850 Hale & Nor 5@5¼
530 Julia 1¼@1.20
410 Justice 65@60c
95 Kentuck 2.65@2½
1040 Leviathan 20@25c
335 Lady Wash 30c
1050 Mexican 14¼@14
100 Mt View 1
500 Mackey 10c
1390 N Bonanza 30@35c
1350 New York 10c
220 Occidental 50@25c
870 Ophir 15½
260 Overman 2½@2¼
580 Potosi 2½@2.60
290 Savage 3.95@3.85
970 Sierra Nevada 17¾@17
700 Scorpion 2.20@2.45
1100 Silver Hill 40@35c
355 Utah 6@6⅜
1135 Union Con 34@32½
490 Ward 75c
650 Yellow Jacket 6½@6¾

AFTERNOON SESSION.

500 Albion 40@45c
1920 Argenta 95c@1
600 Belmont 75c
735 Belle Isle 1½@1.40
350 Booker 30c
350 Boston 1¼
100 Bulwer 9
335 Bodie 8½
2105 Bechtel 1¼@1.30
400 Black Hawk 40c
600 Belvidere 60@50c
760 Champion 10c
150 Caledonia (B H) 2¾
80 C Pacific 4
675 Day 70@80c
100 Dudley 50c
260 Eureka Con 16¾@17
770 Grand Prize 35@40c
1200 Gila 15@10c
100 Golden Terra 12
25 Hillside 1.40
10 Independence 75c
50 K K Con 4½
200 Leopard 5c
250 Leeds 40c
1740 M White 60@50c
80 Mammoth 2½@2¼
20 Manhattan 1½
75 Mt Diablo 11¼
100 Mono 3.10
230 Northern Belle 6¼
250 Navajo 25c
440 Noonday 4½@3¾
130 N Noonday 2½@2¼
500 Oro 15c
300 Paradise 70@65c
75 Queen Bee 30c
500 Real del Monte 1½
130 Raymond & E 90c
925 Syndicate 90c@1
250 S Bodie 15c
200 S Noonday 1.05
90 Silver King 5½@6
500 S Bulwer 40c
50 Summit 50c
480 Tioga Con 1¾@1½
310 Tiptop 2@1¾
850 Wales 4½

Tuesday A. M., Dec. 23.

115 Alpha 6¾@7
255 Alta 2¼
100 Andes 30c
735 Bullion 3@3.10
395 Belcher 1.95@2
195 Best & Belcher 8½@8¾
975 Benton 1.10@1¼
905 California 2.70@3
70 Confidence 7
2370 Con Imperial 35@30c
1240 Caledonia 1.15@1.30
115 Crown Point 1.80@1¾
965 Con Virginia 3@3¼
166 Chollar 5¾@5¾
5570 Challenge 3¼@2.90
160 Con Dorado 75c
200 Dardanelles 80c
510 Exchequer 2¼@2.20
150 Flowery 30@25c
1010 Gould & Curry 4¼@4.05
440 H & Norcross 5½@5¾
635 Julia 1.35@1¼
385 Justice 85@90c
85 Kentuck 2¾
250 L Bryan 10c
505 Lady Wash 50c
950 Leviathan 20@25c
1075 Mexican 16@16¾
100 Mt View 1½
150 Mackey 10c
1055 N Bonanza 35c
550 New York 25c
520 Ophir 17½@17
110 Overman 2.90@3
350 Potosi 2¾@2.80
560 Savage 4¼@4.10
650 Silver Hill 80@60c
1875 Sierra Nevada 16@17½
615 Scorpion 2½
200 Utah 7½
1335 Union Con 30@37¾
140 Ward 50c
420 Yellow Jacket 8@8¾

AFTERNOON SESSION.

320 Addenda 25@30c
2220 Argenta 95c@1
450 Albion 40c
860 Belle Isle 1.20@1.30
50 Boston 1¼
410 Booker 30@35c
200 Black Hawk 50c
1075 Belvidere 50c
10 Bulwer 8¾
1000 Belmont 80c
100 Bodie 6¾
890 Bechtel 1¼
100 Champion 20c
100 Caledonia (B H) 2.60
20 C Pacific 4¼
550 Day 85c
85 Eureka Con 17@16½
50 Golden Terra 12
80 Goodshaw 10c
180 Gila 10c
185 Grand Prize 35@30c
200 Hillside 1.40@1½
60 Independence 80c
100 Jupiter 1.20
60 K K Con 5
100 Leeds 40c
450 Martin White 60@50c
100 Mammoth 2@2.10
320 Mono 3.30@3¼
50 McClinton 40c
30 Mt Diablo 11½
500 Manhattan 1½
10 Northern Belle 6½
250 Noonday 3¾@3.70
750 Navajo 25c
1350 N Noonday 2½@2¼
400 Paradise 60c
470 Raymond & Ely 90@80c
50 Real del Monte 1½
540 Syndicate 1@1¼
50 Star 15c
100 S Noonday 1¾
100 S Bodie 15c
750 S Bulwer 50c
25 Silver King 5½
250 Summit 50@55c
130 Tioga 1.60@1.70
630 Tiptop 1.95
390 Wales 4.60@4½

SALES OF LAST WEEK AND THIS COMPARED

Thursd'y A. M., Dec. 18.

130 Andes 50@45c
225 Alpha 8½@8
290 Alta 2.65@2.60
305 B & Belcher 9@9½
850 Belcher 1.60@1.60
735 Bullion 3¾@3.60
1400 Benton 1½@1.45
710 Con Virginia 4@3.95
555 Chollar 5½@5¾
675 Crown Point 1.90@2
725 California 4@3.95
590 Con Imperial 40@35c
55 Confidence 6½
720 Caledonia 95@90c
215 Challenge 1.60@1.70
2500 C Dorado 1¼@1
100 Dardanelles 80c
405 Exchequer 2.60@2.70
200 Flowery 25c
280 Gould & Curry 4.40@4¼
150 Golden Gate 1.10
605 Hale & Nor 5¾@6
1010 Justice 1@1.05
735 Julia 60@55c
165 Kentuck 2¾@2½
750 Lady Bryan 25c
200 Lady Wash 50c
50 Leviathan 25c
910 Mexican 16@16½
150 Mt View 1
650 Mackey 10c
300 New York 25c
495 N Bonanza 25@30c
630 Ophir 16½@18
550 Overman 4@3.90
50 Occidental 90c
530 Potosi 3@2.90
830 Savage 4.60@4½
1370 Sierra Nevada 21@20½
75 Seg Belcher 11@12
425 Silver Hill 70@80c
245 Scorpion 2.55
190 Utah 9¾@9⅝
1515 Union 40@39
200 Ward 1
770 Yellow Jacket 8½@6¾

AFTERNOON SESSION.

650 Addenda 40c
500 Atlas 20c
1520 Argenta 1.05@1
600 Albion 45c
115 Black Hawk 50c
320 Bodie 8¾@8½
905 Booker 50@40c
835 Belmont 70@80c
170 Belle Isle 1.55@1½
450 Bechtel 1.15@1¼
780 Belvidere 80@70c
30 Boston 1.20
800 Caledonia (B H) 3¼@3
220 C Pacific 5
100 Champion 15c
430 Dudley 25@40c
90 Day 95c
105 Eureka Con 16
50 Endowment 65c
110 Grand Prize 40c
225 Goodshaw 5c
100 Giant & O A 6
300 Golden Terra 12½
2040 Hillside 1
20 Independence 75c
500 Jupiter 1.30@1½
5 K K Con 6
300 Leopard 15c
100 Martin White 55c
150 Metallic 65c
190 Mono 3@3¼
430 Manhattan 1.60@1.70
830 Mammoth 2½@3
100 Mt Diablo 11
275 McClinton 30@40c
100 Noonday 4½@4¼
225 N Noonday 3¼
400 Navajo 25@20c
600 Orient 20c
125 Raymond & Ely 90c
100 Richer 5c
150 Star 20c
825 Summit 75@85c
70 Syndicate 2¼
200 S Noonday 1¾
285 S Bulwer 50c
100 Silver King 4½
770 Tioga Con 1¾@1.80
300 Tiptop 2@1.80
60 University 15c
270 Wales 4½

Wed'sday A. M., Dec. 24.

70 Alpha 7@7¼
200 Alta 2.30@2¼
200 Andes 35c
685 Benton 1.40@1.45
350 Best & Belcher 9@9½
525 Belcher 2.35@2¼
950 Bullion 2¼@3½
260 California 3¼@3.60
335 Chollar 5⅝@5¾
185 Con Virginia 3.35@3.30
700 Con Imperial 40c
330 Crown Point 2@1.90
480 Caledonia 1¼@1.15
140 Challenge 2.40
250 Con Dorado 60@90c
150 Dardenelles 80c
115 Exchequer 2½@2¾
350 Gould & Curry 4½@4.40
350 Golden Gate 1.10
140 Hale & Nor 5⅝@6
160 Julia 1.80@1.40
250 Justice 95c@1
20 Kentuck 2¾
200 Lady Bryan 20c
210 Lady Wash 40@50c
250 Leviathan 30c
605 Mexican 17@17¾
200 Mackey 10c
350 Mt View 1.30@1.20
1750 N Bonanza 35@40c
260 Ophir 16¾
205 Overman 3
260 Potosi 2.80@2¾
50 Solid Silver 15c
1380 Sierra Nevada 18@18½
380 Savage 4½@4.80
325 Scorpion 2.60@2½
330 Silver Hill 55c
890 Union Con 42@44
310 Utah 8¾@8¼
340 Ward 90@85c
470 Yellow Jacket 9@9¾

AFTERNOON SESSION.

300 Addenda 25@30c
50 Argenta 1
490 Belle Isle 1.20@1½
50 Belmont 70c
125 Bechtel 1.30
10 Bulwer 9
150 Bodie 8¾@9
270 Belvidere 60@75c
250 Black Hawk 50c
100 Boston 1.30
100 Booker 35c
30 C Pacific 4¼
1900 Day 60@70c
135 Eureka Con 16
150 Goodshaw 5c
330 Grand Prize 35c
250 Jupiter 1.20
25 K K Con 5
100 Mono 4
110 Manhattan 1½
30 Mammoth 2
115 Noonday 3¾
30 Northern Belle 6¼
180 Paradise 50c
150 S Noonday 1¾
100 S Bulwer 45c
380 Syndicate 1@1.10
250 Summit 75c
70 Silver King 6½
200 Tiptop 2
130 Tioga Con 1.50
270 Wales 6@7

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in Mining and Scientific Press and other S F. Journals

ASSESSMENTS—STOCKS ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Addenda G & S M Co	California	2	20	Dec 10	Jan 14	Feb 3	T H Dixon	238 Montgomery st
Alpha Con M Co	Nevada	11	1 00	Nov 26	Dec 30	Jan 20	Wm Willis	309 Montgomery st
Alta S M Co	Nevada	16	50	Dec 18	Jan 22	Feb 10	W H Watson	302 Montgomery st
Andes S M Co	Nevada	13	25	Dec 18	Jan 23	Feb 16	B Burris	Nevada Block
Aurora Tunnel & M Co	California	4	10	Nov 13	Dec 15	Jan 3	C V Hubbard	203 Bush st
Bechtel Con M Co	California	4	25	Dec 22	Jan 30	Feb 9	W H Lent	Nevada Block
Belcher S M Co	Nevada	20	1 00	Nov 17	Dec 23	Jan 13	Jno Crockett	203 Bush st
Belmont M Co	Nevada	22	25	Nov 4	Dec 8	Dec 29	J W Pew	310 Pine st
Belvidere M Co	California	5	25	Dec 18	Jan 27	Feb 21	C V D Hubbard	203 Bush st
Best & Belcher M Co	Nevada	16	1 00	Nov 5	Dec 29	Jan 19	Wm Willis	309 Montgomery st
Black Hawk G M Co	California	7	25	Nov 14	Dec 18	Jan 7	H A Charles	419 California st
Caledonia S M Co	Nevada	29	50	Nov 10	Dec 16	Jan 6	R Wegener	414 California st
Con. Imperial M Co	Nevada	10	20	Dec 10	Jan 14	Feb 4	W E Dean	203 Bush st
Curtis Con M Co	Nevada	2	05	Nov 21	Dec 24	Jan 12	H S Stone	419 California st
Crown Point G & S M Co	Nevada	39	1 00	Nov 17	Dec 22	Jan 12	Jas Newlands	203 Bush st
Defiance G M Co	California	4	30	Nov 12	Dec 17	Jan 6	W H Lent	309 Montgomery st
Double Standard M Co	California	2	15	Dec 10	Jan 14	Feb 4	W H Lent	309 Montgomery st
Dudley M Co	California	6	25	Nov 19	Dec 20	Jan 16	E C Masten	309 Montgomery st
El Tesoro	California	8	25	Dec 15	Jan 30	Feb 16	W H Chickering	214 Sansome st
Flowery M Co	Nevada	3	25	Nov 14	Dec 19	Jan 7	W W Stetson	309 Montgomery st
Gen'l Thomas M & M Co	Nevada	5	25	Nov 3	Dec 8	Dec 29	Wm Willis	309 Montgomery st
Goodshaw M Co	California	2	25	Nov 24	Jan 5	Feb 2	V Fernbach	327 Pine st
Grand Prize M Co	Nevada	3	75	Nov 25	Dec 30	Jan 20	E M Hall	327 Pine st
Hillside M & M Co	Nevada	1	50	Nov 21	Dec 24	Jan 13	F Frankenthal	330 Pine st
Independence M Co	Nevada	4	25	Nov 16	Dec 18	Jan 8	E M Hall	327 Pine st
Indian Queen M & M Co	Nevada	2	10	Nov 6	Dec 20	Jan 10	A K Durbrow	309 Montgomery st
Julia Con M Co	Nevada	10	1 00	Nov 19	Dec 24	Jan 16	H A Charles	419 California st
Jupiter M Co	California	6	35	Nov 12	Dec 15	Jan 8	E C Masten	309 Montgomery st
Justice M Co	Nevada	30	50	Nov 29	Jan 3	Jan 24	R F Kelly	419 California st
Lady Washington Con M Co	Nevada	1	20	Dec 22	Jan 26	Feb 14	W H Watson	302 Montgomery st
Mammoth M Co	California	3	1 00	Dec 5	Jan 15	Feb 13	A W Field	302 Montgomery st
Martin White M Co	Nevada	5	50	Dec 10	Jan 12	Feb 3	J J Scoville	309 Montgomery st
McCrackin Con M Co	Arizona	4	25	Nov 17	Dec 24	Jan 20	A Wenzelburger	216 Sansome st
Mexican G & S M Co	Nevada	9	2 00	Nov 7	Dec 11	Dec 31	C L McCoy	203 Bush st
North Bonanza M Co	Nevada	4	25	Nov 21	Dec 26	Jan 15	W W Stetson	309 Montgomery st
Northern Belle Isle M Co	Nevada	1	10	Nov 8	Dec 11	Dec 31	E M Hall	327 Pine st
North Carson S M Co	Nevada	9	25	Dec 13	Jan 15	Feb 5	O Betts	113 Leidesdorff st
Occidental Con G M Co	California	3	10	Nov 10	Dec 20	Jan 10	W T Smith	402 Montgomery st
Oriental Con G & S M Co	California	6	25	Nov 8	Dec 10	Dec 27	H C Hinman	411 California st
Original Gold Hill G & S M Co	Nevada	8	15	Dec 20	Jan 26	Feb 14	J M Buffington	309 California st
Overman S M Co	Nevada	44	2 00	Nov 25	Dec 31	Jan 21	Geo D Edwards	414 California st
Potosi M Co	Nevada	2	50	Nov 4	Dec 9	Dec 30	W E Dean	203 Bush st
Real del Monte M Co	Nevada	6	25	Dec 1	Jan 3	Jan 24	O V D Hubbard	203 Bush st
Savage M Co	Nevada	40	1 10	Nov 9	Jan 2	Jan 22	E B Holmes	309 Montgomery st
Seg Belcher M Co	Nevada	16	3 00	Oct 31	Dec 5	Dec 26	Geo D Edwards	414 California st
Sierra Nevada S M Co	Nevada	60	2 00	Oct 31	Dec 4	Dec 24	W W Stetson	309 Montgomery st
South Utah M Co	Nevada	4	10	Dec 22	Jan 24	Feb 13	W S Hinkle	207 Sansome st
Tioga Con M Co	California	8	20	Nov 26	Dec 31	Jan 21	W H Lent	309 Montgomery st
Trojan M Co	Nevada	12	25	Dec 23	Jan 26	Feb 16	D Wilder	328 Montgomery st
Utah S M Co	Nevada	28	2 00	Dec 18	Jan 21	Feb 9	G C Pratt	309 Montgomery st
Wells Fargo M Co	Nevada	13	10	Nov 17	Jan 2	Jan 21	A Colburn	10 Leidesdorff st
Ward G & S M Co	Nevada	5	40	Dec 10	Jan 16	Feb 5	Jacob Stadtfeld	419 California st
Yellow Jacket S M Co	Nevada	35	1 00	Dec 19	Jan 28	Feb 23	Mercer Otey	Gold Hill, Nevada

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business
Ætna M Co	Arizona	1	05	Dec 22	Jan 29	Feb 18	J S Benear	420 Montgomery st
Aurora M Co	California	1	10	Dec 3	Jan 3	Jan 18	P Conklin	28 Sansome st
Black Rock M Co	California	1	03	Dec 16	Jan 20	Feb 24	N T Root	227 Beale st
Cataract & Wide West H M Co	Cal	—	25	Nov 15	Dec 22	Jan 12	Wm B Lake	26½ Kearny st
Chollar M Co	Nevada	—	50	Nov 4	Dec 9	Dec 29	W E Dean	203 Bush st
Eagle G & S M Co	California	1	10	Dec 6	Jan 6	Jan 22	F W Utter	112 Leidesdorff st
Favorite G & S M Co	Nevada	1	01	Dec 6	Jan 7	Jan 23	Julius Peters	121 Sansome st
Florida Hill M Co	Idaho	1	10	Oct 31	Dec 5	Dec 30	R Wegener	414 California st
Gover M & M Co	California	40	10	Dec 24	Feb 2	Mar 1	W O Wilson	402 Front st
Hazard Gray M Co	California	4	03	Dec 2	Jan 5	Jan 25	J T McGeoghehan	318 Pine st
Headlight M Co	California	1	15	Dec 4	Jan 17	Feb 12	A W Field	302 Montgomery st
J & K G M Co	California	1	15	Sept 29	Dec 18	Jan 8	W H Lent	309 Montgomery st
Mariposa Land and M Co	California	17	50	Dec 10	Jan 10	Feb 2	L Leavitt	309 Montgomery st
Maybelle Con M Co	California	4	05	Dec 13	Jan 19	Feb 10	W J Taylor	310 Pine st
Monte Christo Con G M Co	California	2	10	Dec 22	Jan 26	Feb 20	B Burris	Nevada Block
Morgan M Co	California	5	30	Nov 13	Dec 23	Jan 15	J J Raphael	533 Kearny st
Numa M Co	Nevada	2	02	Oct 23	Dec 22	Jan 12	D Wilder	328 Montgomery st
Quartz Mountain G M Co	California	8	50	Dec 1	Jan 5	Jan 26	E Hestres	729 Montgomery st
Quinn M Co	California	—	25	Nov 15	Dec 19	Jan 7	T J Blakeney	Palace Hotel
Revenue M Co	Nevada	1	50	Nov 26	Dec 29	Jan 23	A J Bunner	411½ California st
Summit G M Co	California	4	30	Nov 17	Dec 22	Jan 12	W H Lent	309 Montgomery st
Telfair M Co	Arizona	1	02	Nov 12	Dec 20	Jan 15	J Pentecost	702 Market st
Tellurium G & S M Co	California	20	10	Dec 3	Jan 7	Jan 29	J M Litchfield	415 Montgomery st
University G M Co	California	4	15	Nov 10	Dec 13	Jan 3	W L Oliver	328 Montgomery st

MEETINGS TO BE HELD.

Name of Company.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Argenta M Co	California	E M Hall	Stock Exchange	Annual	Jan 12
Con Virginia M Co	Nevada	A W Havens	Nevada Block	Annual	Jan 8
Eagle G & S M Co	California	F W Utter	112 Leidesdorff st	Annual	Jan 5
Eldora G & S M Co	Nevada	A C Hammond	401 California st	Annual	Jan 6
Griffith Con M & M Co	Nevada	G M Condee	330 Pine st	Annual	Jan 6
Henrietta Gravel M Co	California	F Klostermann	309 California st	Annual	Jan 9
Idaho G & S M Co	California	Col. Meade	324 Pine st	Annual	Jan 12
Leopard M Co	California	E M Hall	327 Pine st	Annual	Dec 20
Lida G & S M Co	Nevada	A C Hammond	401 California st	Annual	Jan 6
Mastodon G & S M Co	Nevada	A C Hammond	401 California st	Annual	Jan 6
Nevada Chief G & S M Co	Nevada	A C Hammond	401 California st	Annual	Jan 6
Northern Light G & S M Co	———	F S Monroe	310 Pine st	Annual	Jan 5
South Star G & S M Co	Nevada	J F Atwell	606 Montgomery st	Annual	Jan 6
Union Con M Co, of Cerro Gordo	Cal	T M Converse	402 Front st	Annual	Jan 14

LATEST DIVIDENDS—WITHIN THREE MONTHS

Name of Company.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Belle Isle M Co	Nevada	R H Brown	S F Stock Ex	75	Nov 5
Bodie Con M Co	California	W H Lent	Nevada Block	50	Jan 2
California M Co	Nevada	C P Gordon	Nevada Block	50	Dec 22
Con Virginia M Co	Nevada	A W Havens	Nevada Block	50	Dec 23
Eureka Con M Co	Nevada	W W Traylor	37 Nevada Block	2 00	Dec 20
Father De Smet Con M Co	Black Hills	Theo Widmann	404 Montgomery st	30	Dec 24
Ophir S M Co	Nevada	C L McCoy	203 Bush st	1 00	Dec 12
Pioneer M Co	California	J W Pew	310 Pine st	08	Oct 6
Standard Con M Co	California	Wm Willis	309 Montgomery st	50	Dec 12

Pacific Board—Latest Sales.

Tuesday A. M., Dec. 23.

20 Alpha 6½@6¾
40 Alta 2
345 Best & Belcher 8@8½
30 California 2.70@2.60
50 Confidence 8¾
100 Con Imperial 35c
95 Con Virginia 2⅞@2.95
50 Challenge 2.90
100 Chollar 5⅝
40 Crown Point 1.8
310 Caledonia 75@85c
140 Exchequer 2½@2.05
340 Gould & Curry 3.80@4.10
300 Hale & Nor 5¾@5⅝
65 Julia 1¼
90 Mexican 15½@16½
145 Ophir 16@17½
250 Potosi 2¾@2.70
40 S Nevada 17@17½
170 Savage 4.10
10 Utah 7½
40 Union 36¾@36¼
120 Yellow Jacket 7½@8¾

AFTERNOON SESSION.

100 Andes 30c
30 Alta 2¼
150 Bullion 3.10@3.05
200 Belcher 1.85
130 California 3.05@3
300 Con Imperial 35c
40 Con Virginia 3.10
50 Challenge 2¾
50 Exchequer 2.05
40 Gould & Curry 4.20@4½
30 Hale & Nor 5⅝@5¾
40 Julia 1.45
65 Justice 85@75c
30 Mexican 17¼
220 N Bonanza 37½c
10 Ophir 16¼
10 Potosi 2.60
10 Sierra Nevada 17½
130 Savage 4.05@4.10
50 Union Con 39@38
40 Yellow Jacket 8½@8¼

California Board—Latest Sales.

Tuesday A. M., Dec. 23.

760 Atlas 15@16c
180 Argenta 1 02½
100 Andes 27½c
100 Atlanta 5c
100 Alpha 6½@6¾
80 Alta 1.95@2
90 Belcher 1.70@1¾
45 Best & Belcher 7¾@7¼
90 Bullion 2.85@3
70 California 2½
40 Con Virginia 2.95
300 Con Imperial 30c
40 Crown Point 1.70
70 Chollar 5⅝
200 Challenge 3½@3.05
100 Caledonia 80c
100 Dardanelles 80c
100 Endowment 70c
150 Exchequer 2.15@2.10
60 Gould & Curry 3.90@3.95
40 Hale & Nor 5½@5⅝
100 Julia 1¼
150 Justice 80@90c
40 Mexican 15½@15¼
250 Mint 5c
150 New York 13@16c
30 Overman 3
30 Ophir 16@15¾
80 Potosi 2.85
700 Senator 8c
150 Silver Hill 46@45c
100 Savage 4.05
40 Sierra Nevada 17¾@17½
40 Union 36@37
200 W Comstock 8@9c
20 Yellow Jacket 7¾@7¼

AFTERNOON SESSION.

30 Alpha 7½
40 Alta 2.20
150 Argenta 1.05
500 Ætna 2c
2900 Atlas 10@15c
150 Andes 25c
30 Belcher 1.90
30 Best & Belcher 8
75 Bullion 2.90@2.95

800	Black Hawk	30@27c	60	Mexican	15@16¼
40	California	3	700	New York	27½@29c
300	Con Imperial	30c	40	Ophir	16¼@16¾
40	Crown Point	1.90	75	Savage	4@4¼
500	Enterprise	1¼@1½	40	Sierra Nevada	17
100	Endowment	70c	250	Silver Hill	65c
140	Julia	1½	40	Union Con	37½@37¾
130	Justice	80c	50	Wales	4
100	I. Wash	45c	40	Yellow Jacket	8¾@8¼

Mining Share Market.

The advent of Christmas brought no riso iu the stock market, and the San Francisco Bonrd adjourned over from Wednesday uutil Monday next, to give the market and the brokurs "a rest." The rumor that J. C. Flood, of the bonauza firm, tho ruler of the stock market for several years, is to retire from mining stock-broking. is a topic of couversation among thu "fraternity." It is said that John W. Mackay is also ahout to retire. Tho news does not soom to have produced auy uuusual depression, but rather on the contrary. The question is who will tako up the reins in their stead, and control the Comstock.

Virginia City just now is in a serions stato of depressiou, but as they have all seen such stock tumbles before, they ought to be used to it by this time.

The crash seems to be due more to a demoralization thau to any very disastrous change iu the miniug situation. The radical chauge in the plau of operation oi the Savage mine no doubt brought about the crash, as it must have upset many plans made by stock purchasers. As we go to press one day earlier than usual this week, to make a holiday of Christmas, we have heen ohliged to omit our usual summary of news from tho Comstock mines.

The advent of Eastern investors into mining operations has not made itself manifest among us to any great extent. They do not seem to care much about dipping into our stocks but are rather looking out for *mines*, which they, strango to say, seem to want to work for what is in them. As loug as this priuciple is held to, they are likely to do hetter thau if investing at hap-hazard in any stock which is offered to them aud which will bo subject to the manipulations of some "insider."

The Homestake Mining Company of Dakota Territory have declared their twelfth consecutive monthly dividend of 30 cents per share, aggregating $30,000, or $360,000 iu all, payablo here and in New York on tho 26th.

November's Bullion Yield.

The Bodie Con., Caledonia, Homestake, Idaho, Father de Smet, Original Amador, Plumas-Eureka, Sierra Buttes, Stewart (Utah), Murchie, Florida Hill and Black Jack (Idaho), gold mines, and the Silver King silver mine have neglected to make any return of their bullion yield for November. That of the gold mines was as follows, with the returns of Bodie Con., Caledonia, and Homestake estimated:

Bodia Con., $75,000; Black Bear Quartz, $14,900; Caledonia (Dakota), $5,000; Excelsior Gravel, $62,000; Golden Terra (Dakota), $27,000; Homestake (Dakota), $60,000; Idado (Nevada county), $20,000; Mammoth (Mono county), $1,400 in silver, $8,400; Milton Gravel, $71,000; North Bloomfield, $15,900; Oneida, $7,300; Pittshurg, $4,400; Syndicate (Mono county), $12,300; Standard Con., $10,100 in silver, $133,800. Total, 14 gold miucs, $517,000.

The yield of the silver mines was: Alexander, $27,200; Belle Isle (Elko county), $5,400 iu gold, $64,700; Christy (Utah), $20,100; Day, net proceeds of ore sold, $4,300; Extra, $3,500 in gold, $14,700; Hillside, $45,000; Manhattan, $155,500; Northern Bellc, $92,600; Navajo, $7,800; Ontario (Utah), $129,200; Paradise Valley, $24,300; Raymond & Ely, for October, $11,600; Silver King (Arizona) estimated $25,000; Star, $25,800; Stonewall Jackson (Arizona), $13,700; Tiptop (Arizona), $31,700; Vulcan (Mono county), $14,200. Total 17 silver mines, $707,400.

The mixed metal mincs yielded as follows, tho first sum being the gold, the second the silver and the third the total: California, $69,500, $56,300, $125,800; Con. Virginia, $108,000, $90,400, $198,400; Eureka Cou., $40,200, $161,500, $201,700; Ophir, $41,200, $61,700, $102,900; Total of gold $258,900; of silver, $369,900; of hoth $628,800. The silver total of Eureka Con., includes $55,300 of lead. The total yield of gold of all mines for last month was $773,300; of silver $1,024,200, of lead, $55,300. The yields for November, 1878, were, respectively, $896,100, $975,600 and $20,800.

Bullion Shipments.

Since our last issue, we have noticed the following hullion shipments:

Belmont, Dec. 22d, $4,393; Northern Belle, Dec. 15th, $6,585.59; Bodie Con., Dec. 16th, $50,200; Northern Belle, Dec. 17th, $6,736.01; Bodie Con., Dec. 23d, $11,691; Gold Hill (Idaho), Dec. 17th, $33,288.

RUMOR says that Congressman Cannon, of Utah, who is already under indictment for violation of the anti-polygamy law, has taken a fifth wife. Several bills are likely to he introduced into Congress against polygamy, and there will he much opposition to the admission of Utah as a State.

Mining Summary.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

CALIFORNIA.

AMADOR.

EMPIRE.—Amador City *Sentinel*, Dec. 17: Mr. Montgomery, an experienced miner, has taken the position of Superintendent of the Empire mine, and Mr. W. T. Jones resumes his old place as foreman. Frank Paron, an Austrian miner in the Empire mine, was killed by a large rock falling upon him in the shaft which he was descending.

BUTTE BASIN.—The water at the Butte Basin mine flows in as freely as ever, and though pumping is continued without intermission, it cannot be got under control. It is thought that the country for miles around will have to be drained before the search for the gravel can be continued.

CONEY.—Work on the Coney mill is being pushed rapidly. The siding is now up, and shingling will be commenced in a few days. The roof is said to be the largest in the county. The building is 80 ft square. A large amount of machinery is already on the ground, and more is being received every day.

ZEILE.—Amador City *Times*, Dec. 19: Considerable heavy mining and mill machinery has arrived at the Ione depot, and is heing rapidly hauled to the Zeile mine by teams, somo 80 tons having already departed from the depot. In the mine a track is being laid in the 500 level, and preparations are being made for taking out ore. The mill building is rising rapidly. Grading has also been commenced for the erection of a substantial residence. It is the intention of the owners to do all the work they possibly can around the mine and mill by machinery.

GOVER.—Amador City *Ledger*, Dec. 20: The large volume of water that was struck some weeks back in the north drift, is now fully conquered. At first there was at least 40 miners' inches flowing into the shaft, which filled up the shaft a distance of 150 ft. At present the flow does not reach more than three or four inches, and this is under easy control. The work of extracting rock was resumed last week. The ore is of fair grade, and altogether the prospects of the mine are better than they have been for a year past. There are about 80 men on the pay roll of the company.

NORTH GOVER.—The contract for running the tunnel will be completed this week, leaving the drift 125 ft from the North Gover line. Another contract will be let at once. At present no ledge appears in the end of the tunnel.

MARYLAND.—The new hoisting works are finished and running; the whistle blew for the first time on Thursday of last week. A combination shaft has been started, by means of which it is proposed to operate both the Maryland and Seaton. A small ledge has been disclosed in the Maryland. There are from 25 to 30 men employed.

BUNKER HILL.—A clean-up was made at this mill last Monday, which yielded at the rate of $10 per ton. The mine continues to look well.

BUTTE.

ORO MINE.—Oroville *Mercury*, Dec. 19: This property is located on South Fork, about three and a half miles from Enterprise. It is owned by the Oro mining company, a majority of the stock being held by residents of this city. Work in the shaft was discontinued last season and tunneling began. The tunnel is now in a distance of 613 ft and 7 inches. Should the ledge not be struck in the distance expected (15 ft) the management will cease work on the tunnel and erect hoisting works over the shaft and sink it 200 ft deeper. The capital stock consists of 50,000 shares, 22,700 of which are now being divided among the shareholders, pro rata, at the value of six cents per share. San Francisco capitalists recently offered to purchase those unsold shares at 15 cents per share, but the stockholders refused to sanction such a transfer. Work on the tunnel is now progressing at the rate of three ft per week. All the work done has been paid for, and the company is out of debt and has cash in the treasury.

ARMSTRONG.—A five-stamp quartz mill is being erected on the Armstrong mine, which is located about three miles from Boston Ranch, on the La Porte road. San Francisco parties are managing the development of the mine, which is believed to a valuable one. The rock assays very high.

CLOSED DOWN.—Work has ceased on the Bader mine, Dogtown district, for the present. The Purshbacker mine is also closed down. Mr. Barrett is reported to have recently discovered surface croppings of what is likely to prove a bonanza.

CONTRA COSTA.

CINNABAR DISCOVERED.—Antioch *Ledger*, Dec. 20: For two years past parties have been engaged in tunneling a hill on the ranch of A. S. Howard, on Marsh creek, in search of a vein of cinnabar. The tunnel is in about 150 ft, and it is authoritatively reported that a vein two ft in thickness and well defined has been discovered during the past few days. Richard Matthews made the discovery, and thinks he has an excellent prospect. The croppings, extending for miles from the Marsh ranch toward the Mount Diablo foothills, indicate a quicksilver vein.

CALAVERAS.

GOOD PROSPECT.—Angels *Echo*, Dec. 16: Some five or six years ago, Robert Sloan and Davis Ownby, while prospecting near Vallecito, discovered a large quartz lead, running east and west. The vein averages about 15 ft in width and is of a light color. When first discovered the prospects were small and it was not valued very highly by the owners; since which, however, they have prospected it more thoroughly, and it has proved to be a valuable claim. On two occasions they have had the rock tested, by what is known as the Willard process, one lot of which yielded $40, and the other $28 per ton. Mr. Ownby sold his half of the claim recently to a gentleman named Birch, who is a practical miner, so also is his partner, Mr. Sloan, and it is altogether probable that they will proceed to develop this immensely rich body of quartz.

DEEP BLUE.—The Deep Blue Gravel mining company will soon be ready for operations. Their mine, which is situated near the Monarch mine, and about four miles from Angels, has been thoroughly prospected and is without doubt one of the most gigantic operations in Calaveras county. W. A. Keefer, the Superintendent, is a practical business man and a good miner.

DOLAN.—The Dolan mine is looking well. The mill, which is a ten stamp one, is about completed; it is an excellent piece of work.

CAVED IN.—The tunnel which drains Vallecito flat, and which is known as the Cohen tunnel, caved in for a hundred ft, completely filling up the passage-way and doing considerable damage. This will probably interfere to some extent with the working of the claims on the flat.

EL DORADO.

A NEW GOLCONDA.—Cor. *Democrat*, Dec. 20: In a recent prospecting tour in the hills, near Kelsey, I found, on the top of one ridge, the largest quartz cropping I ever saw in one body. It extended over 60 ft from east to west, and more than 100 ft from north to south, one solid mass of big white quartz boulders. In the seams and honey-combs on the surface of the boulders I discovered innumerable specks and particles of pure gold, some as big as a pin-head, or larger. In one place the hanging wall had crumbled away, and had left about 7 ft in hight by about 12 ft in length of nearly vertical ledge exposed, and all over the surface of this I found fine particles of free gold liberally sprinkled. On another hill-top, not more than 200 yards from the one just described, I inspected another ledge about eight ft thick, and in a large number of pieces of quartz I broke off I found gold freely sprinkled. At one place in this ledge I found a seam of solid sulphurets, from three to four inches thick, with here and there particles of free gold projecting out of the sulphurets.

FRESNO.

NEW DISTRICT.—Fresno *Expositor*, Dec. 13: Among the miners of Coarse Gold gulch and vicinity a universal desire has been manifested on account of the long distance, expenses and inconvenience of going to Fresno to record mining claims, that a mining district be organized. Accordingly, at a recent meeting, the boundaries of a new district, to be known as the Potter Ridge, were mapped out, and suitable by-laws adopted therewith.

MARIPOSA.

THE VIRGINIA.—Mariposa *Gazette*, Dec. 14: The Virginia mine, about three miles from Coulterville, was located, in 1850, by a company of miners who supposed it to be a passable mine if well worked, but nothing extra. It passed from hand to hand until purchased by a Mr. Coe, of New York, a man of no experience in mining quartz. Johnson & Co. drew him into the purchase and thought they had sold him badly. But time proved otherwise, for after he got into it he tested rock from all parts of the mine, aided by Lewis White, an old and experienced miner and one of the original locators. After fully satisfying himself that it was a good mine, he purchased all of the Hunter's Valley machinery and moved it over to the Virginia, and now has a first-class eight-stamp mill nearly completed. They are sinking a main shaft and running a tunnel to connect the works. The tunnel is run on a level with the mill, and ore will be dumped at the batteries. In the shaft they have had splendid ore from the surface down, but now have exceedingly rich ore. The vein is two and a half ft thick. Mr. Coe will have sufficient ore out by Jan. 1st to pay for his mine, mill and all other expenses, besides having a mine worth $1,000,000.

BANDERITA.—The Banderita mine is looking well. The miners are now in a large body of good ore, and the company is preparing to start the mill.

BOWER CAVE.—The Bower Cave mine, situated on the North Fork of the Merced river, above Bower Cave, was sold by Dr. Austin to P. P. Mast, owner of the Bandorita mine. A contract was let for running a tunnel 200 ft along the vein, which work is progressing rapidly with a fair vein and rich rock. A suitable mill will be built for this mine as soon as the spring opens.

BUNNELL.—The Bunnell mine, on Bull creek, was recently sold by Peter Longhurst to Brown & Looso, who will erect hoisting works on the mine immediately. Mr. Longhurst is repairing his mill, on Bull creek, to crush the ore for them.

NAPA.

PHŒNIX QUICKSILVER MINE.—St. Helena *Star*, Dec. 20: The camp is keeping up its usual business, working 22 men and producing about 100 flasks a month. They are now using ore from the Washington mine. Mr. Patton is Superintendent. Freight is ten dollars a ton from here over in winter, and eight in summer.

DISCOVERED.—A manganese mine is reported discovered on Moore creek, near Conn valley.

PLACER.

DUTCH FLAT.—*Forum*, Dec. 18: Our mining interests are assuming greater activity as the season advances, the abundant rains having furnished an ample supply of water for washing. The Polar Star and Southern Cross are both in active operation, employing between thirty and forty men each, and working two shifts. The Franklin claim at present is idle, but we are informed that the company intend soon to start a new tunnel at a lower level from Bear river, as the pay dirt is largely below the old tunnel, which is nearly useless, unless for working the top dirt. The LeKamp mine is working a small force, and so far, report a very successful run. A. Larson has several men at work in the Shady Glen, with good prospects. The Central company are operating in new ground in a different portion of their claim from last season. The ground, it is said, prospects very fair.

RICH FLAT.—Placer *Herald*, Dec. 20: This Flat, near Auburn, that was so rich in early days, is again the scene of some activity. The Wright Bros. are sinking on a quartz ledge that crosses the Flat, with fair prospects. They have a ledge from 3 to 3½ ft thick, on which they are down between 30 and 40 ft, and they find gold in the rock from the top to the bottom. On the same ledge, further east, Mr. Robert Stuart has also sunk over 20 ft. Where the latter is sinking, the ledge is at least 7 ft thick.

MONO.

BODIE DISTRICT.—*News*, Dec. 21: In the Jupiter a west crosscut has been started, which will be carried the entire width of the vein formation. The greater part of the pumping machinery is now on the ground, and the work of preparing the foundations, tanks and tank stations is being pushed rapidly forward. In the Belvidere work is being pressed as fast as hoisting facilities will permit, and as soon as the 400 level has been reached north and south, drifts on the ledge will be commenced, and east and west crosscuts will be driven the entire width of the ground. In the Dudley the sinking pump is moved up to the station, from whence they pump to the 300 level. The Bodie tunnel is steadily growing with shares in good demand. The face is now in nearly 1,400 ft. A vein of fine quartz, of good milling quality, from 12 to 16 inches in width, was cut 1,375 ft from the mouth. In the Boston Con. the 200-ft station will be opened by Jan. 1st. It contains some very high-grade ore, assaying into the hundreds. Ore is being run to the new mill of the Noonday mine, which commenced crushing on the 23d inst. The Standard mill has started up again, and the manufacture of gold bricks goes on steadily. The Spaulding mill is near completion.

MAMMOTH DISTRICT.—*Herald*, Dec. 17: Work on the H. L. & M. C. Joint tunnel is being pushed on rapidly. The drills have been kept working constantly since Dec. 1st. The ground is still a mixture of wash gravel and cement. The Mammoth mill resumed crushing last Sunday, with every prospect of a long continued run. Another rich strike is reported in the Mammoth mine, the ledge being eight ft wide. The Superintendent of the Homer mine makes a favorable report, saying, in conclusion, that the miners are now all stockholders, and manifest great interest both in the progress of the work and the value of the ore obtained in driving ahead.

CLOVER DISTRICT.—Benton correspondent of the Mammoth *Herald:* The Clover mines are the subject of speculation at present. The ledges are all large and the assays very good. In the Wild Rose assays range from $140 to $2,250. The Oro Fino, a ledge of over 40 ft in width, assays from $40 to $112 at a depth of only 27 ft. The Vulcan mill will start up in a few days for a long run. The ore sent in from the mine is unequaled by any heretofore found in the camp.

NEVADA.

MURCHIE MINE SULPHURET WORKS.—*Herald*, Dec. 20: The Murchie company has lately completed the new sulphuret works erected near the mill. Mr. Smith, in whose charge the works are, has, after several months of experimenting on a new chlorine process, brought it to a satisfactory issue, and the company has held back last month's sulphurets to enable him to give his new process a fair test.

CULBERTSON'S SAILOR FLAT MINE.—*Transcript*, Dec. 18: The tunnel for drifting is in about 400 ft. Prospecting is being carried on in the breast, in hopes of rediscovering the main lead which was lost by a cave some two years ago. Very favorable indications have been found recently, and unless some substantial developments are made soon, hydraulicing will be commenced.

MT. AUBURN.—Steam will be started up at Mt. Auburn's new hoisting works some time next week. The present workings are several hundred ft east of the old shaft.

SCOTT'S FLAT.—John Noyes, at Scott's Flat, is doing regular washing in his hydraulic claim, and will make the first clean-up for the season in about two weeks. He uses 500 inches of water. Geo. Van Gordor has leased the Merrill and Jordan claim.

ACCIDENT AT THE MERRIFIELD.—John Marshal, an employe of the Providence mining company, was recently injured at the Merrifield mine by the premature ignition of some Pattison blasting powder, a recent Nevada City invention. A dry hole about three ft deep was drilled. Marshal cut a cartridge in two, and placing one half in the hole, proceeded to push it to the bottom. As he got it pushed part way down, it ignited, probably by friction. He stood directly over the charge, and the flames shot up into his face, blistering the flesh between the mouth and forehead. The swab-stick which he was using as a ramrod was forced out, and pierced his upper lip. In behalf of the Pattison powder, it is claimed that during the process of charging the hole with the powder, Mr. Marshal thoughtlessly used a swab-stick of one of the miners of the Merrifield mine. It is possible that a certain amount of nitro-glycerine, which is one of the ingredients that is contained in the powder used at this mine, had congregated at the end of the swab-stick, and that the friction of the latter against the Pattison powder was the cause of the accident.

SAN DIEGO.

JULIAN MINES.—San Diego *Union*, Dec. 18: Agents of parties interested in mining matters at San Francisco have been in Julian and vicinity nearly all summer, ostensibly as tourists and pleasure seekers, but really engaged in privately investigating two or more of the claims there which have long been deemed worthless. Negotiations are still pending. We can safely say that rock yielding from $50 to $150 per ton has been discovered.

SAN JOAQUIN.

NEW PLACER DIGGINGS.—Lodi *Review*, Dec. 20: A new placer mine has lately been discovered eighteen miles northeast of here, on Goose creek. The discovery was made by Mr. Oscar Barton, who took up 160 acres of Government land for agricultural purposes some time since. There are innumerable small gulches bordering on and sloping into Goose creek, which, although dry in the summer, is the bed of mountain streams during the rainy season. Mr. Barton was so favorably impressed with the gold-bearing color of the sand in one of these gulches, that he took an ordinary pan and washed a small portion of gravel, when he found from ten to fifteen "colors." Prospecting tours have revealed samples which, it is estimated, will yield $10 per day to the man.

SIERRA.

BLOWN UP.—Downieville *Messenger*, Dec. 20: William Toll, while working alone in a tunnel on his mining claim at Monte Cristo, was severely injured, on Tuesday last, by the unlooked-for explosion of a blast which he had put in, and which failing to explode at once, he thought had not ignited. The sequel showed that it had.

TRINITY.

ITEMS.—Trinity *Journal*, Dec. 20: The weather has been somewhat against the ditch contractors, who are doing well, however, under the circumstances. They have about 140 Chinamen and 25 white men at work on the ditch to Taylor flat. Superintendent Walker has made a splendid trail to Taylor flat and perfected it by a most substantial bridge across French creek. The Don Juan and Dixon Bar companies have water and work has been commenced. Everything looks flattering for a favorable mining season.

TUOLUMNE.

RICH STRIKE.—Tuolumne *Independent*, Dec. 20: On the Gem mine, west of Columbia, a large boarding-house 50x16, for the workmen, has been erected, and a mill building put up, in which will be placed a patent crusher. The incline is down 110 ft on the vein, in good rock. During some necessary changes in the timbering at the top, an astonishing discovery was made. It appears that the timbers were laid upon a vein of exceedingly rich ore, not suspected of being in the vicinity. It is two ft wide, and shows flakes of free gold. Mr. George Morgan is the sole owner. He has contracted with parties below to put in machinery to crush 15 tons of rock in 24 hours.

OLSEN MINE.—The vein has been traced about 1,000 ft, and goes through a hill; the rock something like that of Bodie. The lode is from 10 to 16 ft wide. There is enough in sight to justify all the expenditures they can apply to develop the mine. They have a shaft 100 ft deep, and are still going down.

SHANGHAI.—The extension of the Shanghai quartz lode, near Yankee hill, now owned by Mr. George Morgan, is being worked with intelligent system. A shaft sunk on the hill, with a level 10 ft in, has developed a vein two ft eight inches wide. Mr. Morgan is now running a level into the hill to tap the vein under the shaft, 300 ft below the surface.

HUNTER.—The Hunter claim is being worked with good results. The 10-stamp mill is running on good rock from the 180 level. The main shaft is down 200 ft. The vein is four ft wide.

ITEMS.—Mr. N. Arnold's claim, on Yankee hill, has only been prospected on the top, and $25,000 has already been taken out. The mining outlook for Columbia and vicinity is improving immensely. The Riverside mine will be started soon, it having been sold to New York parties. Work has already actively commenced on the Continental mine, recently sold to San Francisco parties.

NEVADA.

COMO.—Reno *Gazette*, Dec 17: The mills here are running well, and pulp assays high.

OLD MINES REVIVED.—A capitalist from Wisconsin has purchased an interest in the Mountain King mine, McClelland district. Hoisting works have been erected, and they are now down 85 ft on a 16-ft ledge that can be traced three miles. Assays range from $37 to $800 per ton.

CLOSED DOWN.—*Times-Review*, Dec. 20: The stamps of the Grand Prize mill are hung up, and the work of making the final clean-up of the Belle Isle run commenced. After the clean-up, some repairs will be made upon the mill, which will be in complete running order by the 1st of Jan., when it is reported it will start up again on Argenta ore.

LEDGE DISCOVERED.—*Silver State*, Dec. 22: The ledge discovered in Winnemucca mountain last week by John Dunn and Judge Ivory, proves to be more valuable than its discoverers anticipated. Samples of the croppings assayed contained $20.87 in gold and about $1 in silver to the ton. Mr. Dunn says the ledge is large, and the ore can be easily mined, and he thinks it can be worked profitably.

PURCHASES.—Deeds to nine mining claims, located in the vicinity of the Eagle mine, in Spring valley, purchased by the Van De Water Gold and Silver Mining Co. have been filed for record in the office of the County Recorder this week. These claims are the north and south extensions of the Eagle mine, two locations on the Black Hawk ledge, the Bogus, the Pelican, the Puzzler, the Troy and the Gladiola.

ARIZONA.

TIPTOP.—Prescott *Arizonan*, Dec. 19: The bottom of the main or working shaft is now 400 feet below the surface and will be driven 100 ft more, as fast as possible; 200 ft of this shaft will pass through new ground. Three winzes, each 100 ft deep, are already sunk. Two more will soon be made at other points on the vein. Sixty men are employed on the various openings. The daily yield of ore is not great, but it will be as soon as the miners get through with the work of tapping the vein at various depths. The Tiptop is a dry mine; hence, the hoisting apparatus has had but little water to draw up.

HASSAYAMPA.—Messrs. Jennings and O'Neal are in from the Hassayampa, where Mr. O'Neal recently struck a fine ledge of black sulphuret ore, which assays $103 silver and $7 gold. This find is on the Jennings' lead, and about 800 ft south of the discovery location. Jennings has found some very rich gold float, and is now prospecting for the lead.

CINNABAR.—Mr. Stahl received the other day for assay a piece of cinnabar ore from a ledge not far from Prescott which yielded on assay a large amount of quicksilver. The ledge is large, the quantity of ore profusely abundant, and the percentage of mercury unusually great. This is the first large ledge of the kind, we believe, found in this section, and adds an additional source of wealth to the already vast mineral resources of Yavapai.

VERDE.—John Davis is in town from the Verde. He brought in with him some fine looking specimens of silver ore from a ledge recently discovered by him on the east side of the Verde, which is 50 ft wide on the surface, and

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Western Mining Papers.

The influence of the local mining press upon a locality is important, says the Chicago *Mining Review*, perhaps more so than is fully appreciated by such papers themselves. There is now throughout the entire country an active interest in mining, which is growing in breadth and intensity, so that every scrap of reliable news from a mining district is eagerly sought for. It is of the utmost importance, therefore, at this time, that the editors of those journals published in the mining country should most carefully scan every item in regard to mines, strikes, assays, discoveries, etc., that is presented for publication. The people want facts instead of fancy; they demand the actual more than the possible, "the truth, the whole truth, and nothing but the truth."

It may be very pleasant reading for Miner Tom, who has just subscribed for the paper, and wants to purchase a few copies to send East, to read that "Tom's mine is one of the best in this district, and has just struck it rich. Samples assay to the thousands in silver, with a trace of gold. He will probably soon find indications of a true fissure, a mother vein, rapidly widening as he goes down." Such journalism may induce a few other miners to send in subscriptions, in order to read their own names in connection with big strikes, but it at the same time will most effectually turn aside capital that is carefully scanning the field and gathering facts to decide upon a basis of action. Big strikes, large assays and the best mines, have become so common that their announcement has no effect and excites no attention. We have already called the attention of the local mining papers to the importance of giving the particulars of local developments—real growth of mining, and the character and value of ore, mines, and advantages of their respective localities. A letter from a correspondent that reveals wonderful riches in a certain mine, wide vein, inexhaustible supply, rich ore, etc., etc., and condemns all the other mines in the same district as worthless, is certainly suspicious, to say the least, and has no weight with men who, with money in their pockets, are awaiting for facts.

Writers and newspapers West must more thoroughly understand the growing interest throughout the whole country in mining and all that pertains to it, and how capital, backed up by energy and capacity, and shrewd business sagacity, is waiting to be poured into this industry, as soon as the right location is decided upon. Wild stories, extravagant conjectures, flights of fancy as to the possible, pictures of mines yielding double-eagles and diamond rings, have no weight with the men that so many of our mining districts so sadly need at the present time. Such statements and such methods will never attract the class of men to make improvements and confer lasting benefit. There are hundreds of valuable districts as yet untouched, and thousands of as good mines as the best yet opened, all waiting for development. The fate, for years, of many of these localities will be decided by the influence of the Western newspapers. If they grasp the importance and magnitude of the interest they represent, and with liberal spirit devote their energies to the advancement of mining, allowing no selfish or trifling interest to turn them aside from the duty that is due to the cause they have been called to champion, years may be added to the improvements and advantages of the mining country.

The mining interest is so great that it demands a press that shall, in some measure at least, be worthy of its greatness and truly represent it, looking beyond the narrow walls of local or personal interests of the present into the grandeur of its impending future.

Amalgamated Plates for Placer Miners.

The Butte (Montana) *Miner* says: Operations on Snake river, Idaho, during the past summer have demonstrated to a tolerable certainty that the flour gold abounding in that section of country can be saved by the employment of the silver-plated amalgamating plates. A number of companies have been organized in Salt Lake and elsewhere to work the extensive bare which form the banks of the Snake, and though no extraordinary results have been attained, the availability of a vast area of country for mining purposes has been proven beyond dispute.

The main difficulty has been in getting a sufficient water supply, as a heavy head is required to handle the large amount of gravel necessary to be washed. This trouble overcome, however, it is not uncommon for the operators to clean up from $10 to $25 per day to the man. The conspicuous success which has rewarded those who have invested in the proper machinery to work the low-grade deposits of the Snake, naturally leads to the conclusion that an immense scope of country in this Territory which heretofore has been regarded as worthless, can be rendered valuable for mining purposes by the use of the amalgamating plates.

It is generally supposed in Montana that gold diggings are worked out when a man can no longer earn good wages by the rocker or sluice and other old processes of separation. There is a vast amount of surface in this Territory where numerous "colors" can be found, but where the gravel is not sufficiently impregnated with the precious metal to pay by the old methods. The improved plates, lately patented, as manufactured by a California company, have never been experimented with here, as far as we are advised, and there is little doubt that if the almost barren bars of the Snake can be made to pay handsome profits to those who have taken advantage of the modern invention, the vast extent of auriferous gravel in Montana, wherein gold is found in much greater profusion, will yield returns proportionately larger. It is, perhaps, too late in the year to begin the experiment at the present time, but if the owners of "played-out" placers will invest in the amalgamating plates, it is not impossible that their claims would be in a sense rejuvenated, and that the gold product of this favored Territory would grow to enormous proportions.

Red Mountain Mines.

A gentleman who has just returned from the Red Mountain mines, furnishes the Virginia *Enterprise* with the following account of them:

The Red Canyon mines are situated on the summit of a high mountain in the eastern portion of Douglas county, 21 miles east of Genoa, and by the traveled route 44 miles south of Virginia City. A compass set on one of the highest peaks of the mountain showed the district to lie in a direct line between Virginia City and Bodie, both the Bodie mountains and Virginia City being plainly visible on a clear day.

The only accessible route to the mines for loaded teams at present is from the westward by way of Carson valley, or the Mountain House on the Bodie stage road.

The best route to reach the mines from Virginia City is to go by way of Empire City to Callaghan's bridge, on the Carson river, a distance of 17 miles, thence eight miles by the Bodie stage road to one mile beyond the Valley View, or as some call it, the Twelve-mile House; thence 14 miles to Holbrook's ranch, which is the last stopping place where feed for animals or accommodations for travelers can be obtained. From Holbrook's to the mines is six miles, two and a half miles of which is new road, and has a moderately steep grade, so that but light loads can be hauled over it.

On the eastern slope of the range the mouth of Red canyon lies four miles south of Hine's Hot Spring station. The course of the canyon is nearly east and west, and the mountains on either side are very precipitous and rough. From the mouth of the canyon to the mines at its head is nine miles. There is no wagon road, only a foot trail up the canyon, and in some portions that is almost impassable for anything but the surest-footed animals. Near the head of the canyon the mountains rise very abrupt, the ascent in many places averaging three feet to every yard of advancement.

The summit of the mountain on which ars found the principal mines is a broken plateau or table land, from one to three miles in width and seven or eight miles in length. The surface or cap-rock is a soft syenite often and readily mistaken for genuine granite. On the surface where it is exposed to the action of the elements it hardens, but when penetrated a few feet below the surface is quite soft and seldom requires blasting. The cleavage of the cap-rocks is generally from east to west, except lower down on the mountains and to the northward, where outcroppings of porphyry and diorite are shown.

On the outskirts of the district some very large quartz veins have been found, but so far as known what are believed to be the paying ore veins, are small, ranging from three or four inches to four feet in thickness.

These ore veins, for the most part, have an east and west course, with a slight dip to the south and east. The ore is a lively gold-bearing quartz, sometimes very soft and friable, filled with iron sulphurets, often carrying considerable quantities of galena. Assays of gold running up into the thousands are easily obtained, and in some of the veins free gold is often visible to the naked eye. A ready test of the ore is made by pulverizing and panning or horning out the gold, which is often of a very coarse character.

But little work of any value has been done in the district, the deepest shaft of an ore vein being 45 feet. The Warhorse, one of the oldest locations, owned by Messrs. Gray and Carter, worked $63 per ton in an arastra, which was started up just at the setting in of winter, but which is now frozen up.

The Knox and Knight, one of the principal claims in the district, is an east and west vein. The float ore from this ledge was first discovered by Thomas Roberts, an old Virginia miner, but the finding of the ledge was left to C. M. Knox, an old resident of Mason's Valley and an old prospector. This ledge has been traced for a distance of 3,000 feet or more. The four principal locations are the Knox, the Knight, the North Star and the Morrison, all of which show good ore.

There is an abundance of wood and water for milling and other purposes within a range of five or six miles of the mines. All that is needed to assure its permanent prosperity is for the owners to sink on their ledges and prove that they are true and continuous veins, and that the richness of the ore holds out as depth is attained.

There are now only about a dozen prospectors in the district, and but little can be done in the way of work before spring, as at this time the summit of the mountain is covered by a foot or more of snow. There are no accommodations, and as the altitude is great, it would be useless for those thinking of going there to attempt to do so before the opening of spring.

Effects of Heat on Men in Mines.

In an interesting paper at the Pittsburg meeting of the American Institute of Mining Engineers, Mr. John A. Church reviewed, at considerable length, the accidents in the Comstock mines and their relation to deep mining. In several instances miners have been fatally scalded by falling into the hot mine waters, which exhibit temperatures rising to 158° Fahr. The most remarkable casualties, however, are due to the killing effect of labor in the hot and steaming atmosphere. The proportion of fatal casualties is larger in this class than in any other, being 73%; and from the peculiar mental effects of the heat it is highly probable that it may be the real cause of many mishaps, which, under other circumstances, would be ascribed to culpable blundering.

On the 1900 level of the Gould & Curry mine, a drift was run along and quite near to the black dike, one of the hot spots of the mine. At a spot where the thermometer marked at times 128° Fahr., Thomas Brown fainted while at work. When taken to the surface and revived, he was found to have completely lost his memory. He could not tell his name or where he lived, and had to be dressed and taken home by his friends. The newspaper which recorded the occurrence said that such sudden loss of memory from overheating was quite common in the mines; and suggested that the fact might furnish an explanation of the walking off into fatal winzes and chutes by experienced miners, seemingly with deliberate intention.

A frequent accident in these mines is fainting in the shaft while the cage is rising to the surface. The faintness is always felt immediately upon reaching the cooler air, 100 or 150 feet from the surface, where there is usually a side draft through some adit. This happens so often that a man who has been working in a hot drift is never allowed to go up alone. Long habitude to the heat is no safeguard against this danger, and serious accidents have occurred in this way.

Among minor casualties, Mr. Church mentions one which happened to Mr. Sutro, in the Sutro tunnel, before it made a connection with the Savage mine. After spending some time in an air temperature of 110° Fahr., Mr. Sutro went to the air pipe to cool off. He stayed so long that the miners told him to get way from the pipe and let them have air. He did not move, and when they tried to stir him up with the handles of their shovels they found him unable to move. He had lost all volition, and had to be taken out on a car.

The graver results of overheating include insanity and death. The death of a carman on the 1400 level of the Caledonia mine, Gold Hill, March 11th, 1878, is a case in point. He had been idle for six months, and that morning he was working his first shift. At an early hour he rushed into the station of the 1400 level and reported that the wheels of his car were smashed. The station master returned with him to his car and found it all right. There was evidently something wrong with the man, and he was taken to a cooling place. Here decided mental aberration was discovered, and the man, firmly lashed to the cage, was hoisted to the surface, where he fainted at once and died in a few minutes. In this case the heat was only about 90° Fahr.

In another case a miner died from cramps, attributed to heat, but which may have been due to drinking iced water; and another death is charged to a cold taken while cooling off after being partially overcome with heat.

Though contrary to the rules of outside hygiene, the miners resort to copious drafts of ice water or to exposure to strong cold air currents for recovery from overheating, and usually with impunity. The cold air cooling is considered the safer method, but to gain time Mr. Church commonly chose the ice water, and never felt any ill effects from it. With several thousand cases a day of rapid cooling off by one or the other of these methods it is surprising that fatal consequences have been so infrequent.

The next case illustrates the violent effects which excessive heat may have upon a person not accustomed to it: "On Friday, October 11th, 1878, John McCauley went to work for the first time in the Imperial mine. He was cautioned against overexerting himself in the extreme heat of the lower levels. He replied that he thought he was strong enough to stand anything, and paid no attention to the advice. At half past two in the afternoon he was brought to the surface in an unconscious state, and died the next morning at half past ten o'clock." Two other cases very similar to this have occurred in the Imperial within a few years. This mine is excavated in one of the hot spots of the Comstock.

The hot drift on the 1900 level of the Gould & Curry is the scene of the most serious of these casualties due to heat. Five men were sent there in June, 1878, to load a donkey pump on a car. The work was so exhausting that when the pump caught on a plank they were not able to move it. They seemed to have been in a state of mental confusion, but felt that they could not remain longer. Starting up a winze which connects with the 1700 level, one man fell on the way, and the others were afraid to stop to help him, but pressed on, reaching the 1700 level in half an hour from the time they left it. They were very confused and nearly speechless, and hardly realized what had occurred. Three men went down to the rescue and found the fallen man still alive. Clearing the pump they got into the car and signaled to hoist, but on the way up the man they had gone to rescue reeled and fell off. The car was stopped at once, but he was jammed between it and the brattice so fast that the others left him and went for help. They all gave out, two half way up, and the other just as he reached the 1700 level, where a friendly hand pulled him up. A new rescue party went down and found two men dead, and the third died soon after. The shift boss reports that "the accident was due solely to the heat, as the air is good enough and pure enough, barring the heat." The winze was not an abandoned one, but in daily use. A heavy volume of steam is reported to rise through it from the 1900 level, the temperature of which at the time of this accident, is given at 128° Fahr. Mr. Church gathers from the detailed account that the death of the men is possibly attributable to the fact that when the miner fell off the car the latter was stopped in a place that was hotter than the rest of the winze. It is to be regretted that no adequate studies have been made upon the precise physiological phenomena presented by death under these circumstances. The legal requirements are satisfied when it is proved that the casualties are due to heat.

Placer County Mines.—The Placer *Herald* says: We have received from Frank X. Lavalle, Superintendent of Pugh's quartz mill, Ophir, a statement that speaks more for the quartz lodes of Auburn and Ophir districts than any amount of praise in general terms could do. Fulsome praise and prompted puffs are good as far as they go, but facts and figures, after all, are what afford consolation to the inquiring mind, and here we have them: This mill runs almost entirely on custom ore, and hence its crushings include rock from nearly every ledge in this and Ophir districts. For the year from Dec. 1, 1878, to Dec. 1, 1879, the amount of rock crushed was 1,120 tons. From this rock there were obtained 1,397 ounces of retorted gold, or about one and one-fourth ounces to the ton, an average that we don't believe the quartz ledges, taken indiscriminately as this showing takes them, of any part of the State will equal. Allowing the low estimate of $14 per ounce, this would give a yield of $17.50 per ton, on an average, for all the rock taken out by the prospectors during the year, assuming that the rock crushed at the other mills will compare with the rock crushed at this, and there is no reason for believing it is any different. We often think, and this showing goes to strengthen the idea, that if the quartz veins that rib this county from Penryn to Clipper Gap or Colfax, were known to exist in some far off country, remote from civilization and difficult of access, the whole civilized world would become excited over them, thousands of men would risk their accumulations, and even their lives to reach them, and capital by the millions would pour in from all parts of Christendom to work out their development. It must be admitted, after all, that there is with men, as with women, a peculiar charm about that which is most difficult to reach and hardest to obtain.

Bodie Mines.—The *News* says: Every day the work of opening up and developing our mines is continued with the most encouraging results. Of course it must not be expected that every shaft will prove a mine, yet there can be but little question that those lying on the great mineral belt will prove valuable properties. Were the Noonday, Booker, Queen Bee, University, Addenda, Red Cloud, Maybell, Dudley, and many other mines directly on the lead and showing fine bodies of ore, located in Virginia City, their stock would be selling at quadruple what they are doing on the boards to-day. There is no mine in Virginia City that shows the large body of paying ore uncovered in the Noonday; there is none that shows the quantity of high-grade ore in the Addenda with as good a prospect of its opening out into a rich bonanza. None can tell what may yet be uncovered, but from the strong formation and the solidity of the ore body it is reasonable to infer, being 26 feet wide, that it must continue as the Standard rich ore, having but slight changes in quality. On Bodie Bluff the outlook is equally cheering. That the Tioga will open up a mine when a proper depth has been attained all indications go to prove. The Bechtel is now in a fine body of ore, whilst the prospects of the Jupiter are in the highest degree encouraging. The McClinton, Con. Pacific and Mono have the most favorable prospects, whilst the Blackhawk, with a fine vein of bright, lively ore, and in a good, strong formation, gives evidence that depth must be attained before they can uncover a mine.

In Russia, at the present time, there are 205 distinct establishments engaged in the manufacture of agricultural machinery. Eighty are driven by steam power, seven by water power, ninety by horse power, and the remainder by hand power. From the description of the power employed, it is reasonable to suppose that most of these establishments are on a small scale.

Blast Furnaces in Great Britain.—The *Iron Trade Circular* of recent date publishes a detailed list of the blast furnaces in and out of blast in Great Britain. The list is arranged by counties, and footed up—456 in blast, 493 out of blast, or a total of 949.

Detestable Frauds.

The innumerable swindlers who operate through the mails are being made known through the Postoffice authorities. The *Western Rural* prints an alphabetical list of names which represent people whose letters the Post-office officials have ordered retained in the hands of the Postmasters of the several towns because the parties are doing a fraudulent business through the mails. It would be well for our readers to preserve this list for reference, and whenever they see an advertisement of questionable character, to examine the list and ascertain if it contains the name or names of the advertiser or advertisers. The list is as follows:

Allen, H. D. P., *alias* W. T. McCall, National Banking Co., New York city.
American Coral Co., Pittsburg, Pa.
Arizona Lottery, Prescott, Arizona.
Bartelle & Co., B. C., Gloucester, N. J.
Bennington & Co., A. B., *alias* Jace Marks, Lansing, Iowa.
Benton, D. V., Laramie City, Wyo.
Bishop, L. D. S., Cincinnati, Ohio.
Brain, John C., *alias* Excelsior Mf'g Co., Sheffield Fire Arms Agency, New York city and Chicago.
Bristol Piano Co., New Bedford, Mass.
Burrow, John, Bristol, Tenn.
Burtnett, H. A., New York city.
Coldwater, Michael, Prescott, Arizona.
Clark & Co., *alias* Silver Mining Co., New York city.
Cosmopolitan Stamp Co., *alias* Philadelphia Stamp Co., Giovannia Patroni, Philadelphia, Pa., and Camden, N. J.
Crest, John, *alias* W. J. Hill, C. H. Walker, C. Wade, Elkhart, Ind.; Augusta, Mich.; Battle Creek, Mich.
Eastern Manufacturing Co., Boston, Mass.; Rockland, Me.; Chicago, Ill.
Egerton & Co., Camden, N. J.
Edmunds & Co., J. E. Webster, Mass.
Eggleston, Edward A., Rosita, Col.
Elias, Ellis H., *alias* Russell & Co., New York city.
Florence Jewelry Co., Pittsburg, Pa.
Franklin, George W., Louisville, Ky., and Glasgow, Ky.
Freshman & Co., Pittsburg, Pa.
George & Co., Jas. W., New York city.
Gustavus & Co., E., *alias* F. E. G. Lindsay, Holston, W. Va.
Hall & Co., H. J., Baltimore, Md.
Hall & Co., J. H., New York city.
Hamilton & Co., J. B., New York city.
Heister, Charles E., *alias* U. S. Syndicate, New York city.
Henry & Co., J. C., *alias* Clarence W. Miller, Glen Falls, N. Y., and Chester, Pa.
Hill, W. J., *alias* C. W. Whitney & Co., Elkhart, Ind.: Augusta, Mich., and Battle Creek, Mich.
Hurlburt, William H., *alias* Western Gun Co., Chicago, Ill.
Jones & Son, A., Hopkinton, Mass.
Jones, Edgar W., *alias* Harry J. Littleton & Co., Union Purchasing Agency, Union Publishing Co., Magnetic Watch Co., Ashland, Mass., and South Framingham, Mass.
Kentucky Land Co., Louisville, Ky.
Leavitt & Co., *alias* Russell & Co., Sunbeam Publishing Co., New Bedford, Mass.
Lindsey, F. E. G., Holston, W. Va., and Abingdon, Va.
Littleton & Co., Harry J., Ashland, Mass., and South Framingham, Mass.
McCall, W. T., New York city.
Magee, John W., Laramie City, Wy.
Magnetic Watch Co., Ashland, Mass., and South Framingham, Mass.
Marks, Jace, La Crosse, Wis.
Miller, Clarence W., Chester, Pa.
National Art Co., Cincinnati, Ohio.
National Banking Co., New York city.
Paris Novelty Co., Boston, Mass.; Rockland, Mass.; Chicago, Ill., and Camden, N. J.
Patteo, J. M., Manager, Cheyenne, Wy., and Topeka, Kan.
Premium Art Co., Pittsburg, Pa.
Reade & Co., New Haven, Conn.
Royce, J. M., Grafton, W. Va.
Russell & Co., New York city.
Russell & Co., New Bedford, Mass.
Russell, Hopping & Co., Riverside, N. J.
Silver Mining Co., New York city.
Sine, L. D., *alias* L. D. S. Bishop, Cincinnati, Ohio.
Slocumb, E. Ellsworth, *alias* Paris Novelty Co., Eastern Manufacturing Co., Boston, Mass.; Rockland, Mass.; Chicago, Ill.
Stewart, Frank, Philadelphia, New York.
Sunbeam Publishing Co., New Bedford, Mass.
Texas Gift Concert Association, Dennison, Texas.
Tomlinson, James A., New York city.
Tyner & Co., J. C., *alias* American Coral Co., Florence Jewelry Co., Freshman & Co., Premium Art Co., Pittsburg, Pa.
United States Syndicate, New York city.
Union Publishing Co., Union Purchasing Agency, Ashland, Mass.; South Framingham, Mass.
Union Silver Plating Co., Cincinnati, Ohio.
Wade, C., *alias* C. H. Walker, Elkhart, Ind.; Augusta, Mich.; Battle Creek, Mich.
Webber & Co., *alias* National Art Co., Union Silver Plating Co., Cincinnati, Ohio.
Western Gun Co., Chicago, Ill.
Whitney & Co., C. W., Glenn Falls, New York, Chester, Pa.
Wilcox & Co., Windsor, Pa.

The Oil Reservoir in Moody's Gulch.—The location of this newly-developed "mine of wealth," is in the township of Lexington, about one and a half miles southeast of Alma station, on the Narrow-Gauge railroad, Santa Clara county. The success of this enterprise is due to the unbounded perseverance of Mr. McPherson, the President of the company lately organized for the purpose of prospecting. Mr. McPherson came to California about four years ago, as agent for Farrar & Co., of Buffalo, N. Y., manufacturers of engines and boring apparatus, for the celebrated oil district of Pennsylvania. He turned his attention first to the Los Angeles district, where he spent his efforts and money without success. That he is now about to reap the reward of the patient application of years is a matter of congratulation of his many friends. Soon after reaching a depth of 780 feet, which required five or six months' hard labor, the out-pouring stream of petroleum ascended to a hight of 100 feet above the surface of the ground, pouring out a waste of 100 barrels before it could be stopped. Oil is now being pumped at the rate of a barrel an hour. If this discovery reaches the proportions that it is confidently believed it will, the Narrow-Gauge Railroad Company will, not unlikely, build a branch road to the well or wells, from Alma station. Preparations are already completed to commence the second well.

Useful Information.

Oxidation of Iron and Steel when in Juxtaposition.—In a paper read before the Iron and Steel Institute, at its recent Liverpool meeting, Mr. G. Radcliffe incidentally mentioned a case in which steel boiler plates had, when exposed to the same circumstances as adjoining iron plates, distinguished themselves by pitting more than the latter, the steel plate next to the iron being oxidized considerably more than any other. The following analysis by Mr. Edward Riley gives the chemical composition of the steel:

Carbon	0.330
Silicon	0.102
Sulphur	0.065
Phosphorus	0.066
Manganese	0.518
Copper	0.053
Iron	99.320

Mr. Radcliffe's conclusion, although he does not distinctly state it, is that it will not do to place iron and steel side by side.

Slag Boiler Covering. Mr. Franz Buttgenbach, the well-known metallurgist, gives the following method for the utilization of blast furnace cinder as an insulator for steam pipes, etc.: Mix 150 parts of cinder dust, 35 parts by weight of fine coal dust, 250 parts of fire clay, and 300 parts of flue dust, with 10 parts of cow's hair, add 600 parts of water into which 10 to 15 parts of raw sulphuric acid has been poured, and make a stiff dough of the whole. This is thrown in small amounts upon the warmed pipe, hardening rapidly. Upon this rough coat, a second, third, etc., is laid according to the thickness which is to be used. By the action of sulphuric acid gypsum is formed, and the silica, rendered free, hardens. The mass becomes as hard as porcelain, and is still porous. It adheres firmly, and never cracks. Mr. Buttgenbach states that he has tested its merits by ten years' use, and has found it to meet all requirements.

Silvering Mirrors.—Some time since the Academie des Sciences offered a prize of 2,500 francs for a method of satisfactorily and permanently silvering mirrors, and which should save the workmen the danger of exposure to the effect of mercurial vapors. The prize has been awarded to M. Lenoir, whose process is substantially as follows: The glass is first silvered by means of tartaric acid and ammoniacal nitrate of silver, and then exposed to the action of a weak solution of double cyanide of mercury and potassium. When the mercurial solution has spread uniformly over the surface, fine zinc dust is powdered over it, which promptly reduces the quicksilver and permits it to form a white and brilliant silver amalgam, adhering strongly to the glass, and which is affirmed to be free from the yellowish tint of ordinary silvered glass, and not easily affected by sulphurous emanations.

Destruction of Cast-Iron Gas Mains.—A curious case of deterioration of cast-iron gas pipes has recently been observed at Saarbrucken. The pipes in question had been laid for 10 years, and when removed were found converted into a soft substance which could be cut with a knife, and, on analysis, was found to contain only 52% of metallic iron. The pipes were laid in channels cut in soft sandstone, filled in with ashes from locomotives. The coal which produced these ashes was from the Saarbrucken basin, and was relatively rich in sulphur. The destruction of the pipes was most probably due to the action of the sulphur contained in the ashes, combined with the oxygen of the atmosphere. This view is supported by the fact that the substance into which the pipes had been changed contained 1⅓% of sulphuric acid. A large number of pipes were completely destroyed and had to be renewed.

Photo Decoration of Metals.—Herr Falk's photographic method consists in coating the metallic surface with a photographic film, which is then exposed under a transparent positive; by this arrangement the parts lying beneath the dark places of the positive are not affected by the light, and are consequently capable of being etched. With curved surfaces a print taken in fatty ink on paper by a photographic method is transferred to the metal, and all the parts covered with the ink are by this means protected from the etching. It is a peculiarity of this process that the etching fluid colors all the etched places black, and this adds considerably to the effect of the whole.

A Brilliant Purple for Show Bottles.—Sulphate of copper, two drachms; water, two ounces; French gelatine, one drachm; boiling water, two ounces; solution of potassa, two pints. Dissolve the copper salt in the water, and the gelatine in the boiling water. Mix the two solutions and add the liquor of potassa. Shake the mixture a few times during ten hours, after which decant and dilute with water.

The Deepest Diving.—The deepest depth to which the diver has descended in pursuing his dangerous occupation, was that reached in removing the cargo of the ship *Cape Horn*, wrecked off the coast of South America, when a diver by the name of Hopper made seven descents to a depth of 201 feet, and at one time remained down 42 minutes.

Action of Sewer Gas on Lead, Etc.—The sanitary inspector of Dundee, Mr. T. Kinnear, has watched the effect of the gas on portions of the zinc eaves of buildings where it was striking on the under part, and found, in the course of a couple of years or so, pretty large holes eaten completely through, showing that material could not long withstand the effect of the gas. Lead is, of course, more durable than zinc, but the difference is only a question of degree, as shown by the fact, in not a few of the waterclosets repaired by the officers of the department during the year, small apertures were found in the main vertical lead pipe, and in the cross or horizontal one leading from it to the trap of the closet various perforations were found on the top, indicating clearly the operation of foul air from the drain. Lead traps and soil pipes from waterclosets, baths and fixed basins are all subject to wear and tear; but the traps, being burdened with the additional strain of barring the passage of sewer gas, do their work less efficiently, and for a much shorter period than they are generally credited with, hence the necessity for proper ventilation and occasional inspection.

Treatment of Gold-Fish.—Seth Green says this as to the proper care and treatment of gold-fish: "Never take the fish in your hand. If the aquarium needs cleaning, make a net of mosquito-netting and take the fish out in it. There are many gold-fish killed by handling. Keep your aquarium clean, so that the water looks as clear as crystal. Watch the fish a little, and you will find out when they are all right. Feed them all they will eat and anything they will eat—worms, meat, fish-wafer or fish-spawn. Take great care that you take all that they do not eat out of the aquarium; any decayed meat or vegetable in water has the same smell to fish that it has to you in air. If your gold-fish die, it is attributable, as a rule, to one of three causes—handling, starvation or bad water."

A Useful Copper Alloy.—A very useful copper alloy, which will attach itself to glass, metal or porcelain, may be made as follows:—From 20 to 30 parts finely blended copper (made by reduction of oxide of copper with hydrogen or precipitation from solution of its sulphate with zinc) are made into a paste with oil of vitriol. To this add 70 parts of mercury and triturate well, then wash out the acid with boiling water and allow the compound to cool. In ten or twelve hours it becomes sufficiently hard to receive a brilliant polish and scratch the surface of tin or gold. When heated it becomes plastic, but does not contract on cooling.

Good Health.

Brain Growth.

The question is often asked: "How long does the brain of an individual continue to grow?" Some have an idea that it attains its full growth at the age of 20 years; and we have seen assertions, professing to be from medical authority, that the brain attains its growth at about 14 years; but no close observer, no phrenologist who has had opportunity to measure thousands of heads, and to measure not a few of them, say once in five years for twenty-five years, will believe a word of it.

In many cases the brain will increase in size till a man is 60 years of age, provided he have a healthy, vigorous body, and live correctly, so far as diet and labor are concerned, and the mind be kept in an active, but not over-excited state.

Any sharp observer may enter 50 churches in succession, when the congregations are full, and he will readily see that the gray-headed father, sitting at the head of his family with his son 25 years of age by his side, will have a considerably larger head than his son. In numerous cases this can be remarked in looking up and down the aisles. The old gentlemen's heads are the largest. If we revisit the same church 30 years afterward, we will find the energetic son with gray hair sitting at the top of the pew, and his son at his side; and the older man will have a head larger than the hopeful son—showing that it had been growing up to 50 years of age or beyond. We have just received a letter from Mr. L. N. Fowler, of London, which contains one remarkable passage. Mr. Fowler says: "I shall send you soon the phrenological character of Sir Josiah Mason, of Birmingham, England. In 1864 I measured his head, which was 23½ inches; in 1869 it measured 24 inches; and now, in 1879, it measures 24¾ inches, plump; and he is now in his 85th year."

The law of growth, in respect to the brain, is the same as that relating to growth of body. If a muscle, or set of muscles, be called into frequent and efficient exercise, they become thereby hungry for nutrition; and when the blood is passing those parts, the nutrimont carried in the blood is absorbed by the parts needing it, and they become enlarged. A broken bone needs at the point of fracture bone-making material, and the blood which carries nutrition for every part, as it passes the region of the fracture, loses by affinity the material which the bone wants to repair the fracture. As the blood passes a flesh-wound, that part of the blood adapted to heal the wound is taken up and used where it is required. Let a person exercise the brain in the intellectual or thinking region and the forehead will grow, while other parts remain stationary. Persons engaged in rough, laborious business need the exercise of the base of the brain, and that part of the head will grow; but if the labor require also the active exercise of the intellectual organs, the two regions will become enlarged accordingly. Those who devote themselves mainly to moral and esthetical subjects will be found with a larger top-head; and those who have body enough to give adequate support to the whole system, including the brain, will be able to increase the size of the brain year by year by the general exercise of all the faculties until old age. The body increases in size in old age, why not the brain? Generally there is not vigor enough in the vital system to sustain the body and push the development of brain beyond the age of 50; but there are cases which we happen to know, proving brain growth until after 60 years of age.

Some persons think it impossible for the brain to increase in size after the bones of the skull have become hard and strong. When the brain requires more room in any part, the bone material of the skull is gradually absorbed or dissolved, and, like lime-water, is taken up by the circulation to be reorganized into new adjustments of the skull, large enough for the brain. The clam shell is as thick as a human skull and much harder, yet a clam will double his size in two or three years, during which time the entire shell will have been reconstructed on a larger pattern in every direction. The clam is never imprisoned or cramped by his shell; he is, like the brain, simply protected and shielded as by a friend. The shell is alive, and so is the human skull, like the finger nails, or the hoofs of animals, and capable of rapid growth, though the process be to us imperceptible.—*Phrenological Journal.*

Appearances of the Tongue in Gastric Disorders.

Dr. Wilson Fox gives, as valuable aids in the diagnosis of gastric disorders, the following conditions of the tongue:

1st. Dyspepsia, with distinct atony of the stomach. The tongue broad, pale and flabby, the papillæ generally enlarged, more especially at the tip and edges.

2d. Dyspepsia from irritative causes. The tongue is redder than usual; often of a bright florid color, or even raw looking. It is often pointed at the tip, which, together with the sides, presents an extreme degree of injection, the papillæ standing out as vivid red points. This form is often associated with aphthæ, and is most common in scrofulous children and phthisical adults.

3d. Dyspepsia from excessive or hurried eating is apt to present a tongue uniformly covered through the greater part of its surface with a thick fir, whitish or brownish, with some degree of enlargement and redness of the papillæ at the tip and edges.

4th. Neuroses of the stomach display a tongue which, as a rule, is clean, though often pale, broad and flabby.—*Lancet.*

Setting the Mad to Cure the Mad.—At an asylum in Vienna (says the *Union Medicale*, quoting from the *Danube*) a novel method of treatment has been adopted. The director has established a lithographed journal for circulation in the asylum, and he induces the patients to contribute to it. Especially he encourages them to refute the manias of their comrades. The man who believes his nose to be made of sugar candy and liable to dissolve, he says, can argue with excellent logic against the folly of his friend's theory that his beard is a tender plant and needs frequent watering. As a rule, they are able to discuss with good sense all subjects except those which concern their peculiar delusion.

A New Therapeutic Agent.—A new method of treating cancerous growths, tumors, etc., consists in subjecting the parts to a stream of hot, dry air. This is proposed and has been successfully applied by Dr. G. A. Keyworth, of England. By means of a foot bellows he caused air to pass through a glass vessel containing calcic chloride, then through a heated iron tube, and thence directed the hot, dry air against the surface of a cancerous sore. The treatment was continued for an hour, the effect being to relieve the pain and cause the parts heated to shrink and dry up very considerably. It is believed that this new method will prove valuable when proper appliances are employed to maintain and direct the supply of the air.

Congestive Headache.—The use of the old domestic remedy, a tight bandage, during the attack is useful. I make use of a rubber bandage, applied thoroughly from the eyes up, with a thin pad over each temporal artery, if the temporal ridge be sharp enough to keep the bandage from compressing the arteries. Instead of rubber, a well applied muslin bandage may be put on and then wetted, using compresses over the temporal arteries. The comfort thus given is sometimes surprising.—*Sanitarian.*

A New Danger from Rabbits.—Referring to a recent death at Kerang from hydatids of the liver, a correspondent of the *Bendigo Advertiser* states that the rabbit nuisance is likely to soon come to the front in another form, it being an expressed medical opinion that this disease, which is another name for flake, is spread by the use of rabbit's flesh for human food.

To neutralize the sting of a gnat or mosquito, French sportsmen rub the part affected with a little *cerumen*, that is, the wax of the ear, extracted by the little finger.

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The Week.

The topic of conversation just at present is the unusually cold spell which has come upon us, and which seems to have extended over the whole coast. The Oregon rivers are frozen over, and Washington Territory and British Columbia are ice-bound. Thermometer 32 degrees below zero in Washoe, and ice all over the country. Wednesday was the coldest day in San Francisco since the establishment of the Signal Service station here in 1870. At 5 A. M. the thermometer was 34 degrees, and the highest point during the day was 44 degrees. The mean temperature was 39. In some instances the water pipes were found frozen, a most unusual circumstance among us.

There has been a sort of lull in general business, which is usually attendant on Christmas week. The people have donned holiday attire and thronged the streets intent on Christmas purchases, and it is not likely they will settle down into the humdrum of every-day work till after New Year's.

The mining news of the week is barren of much interest. The Comstock is depressed, and stocks are down. The California miners will rejoice at the cold weather, which will lock up a store of water for the spring washing and make flush times with them. The mining "boom" in the East still continues, but more attention is being paid by Eastern investors to the Black Hills, Colorado and Arizona than to California or Nevada, so it has been of very little value to us as yet.

PROTECTION OF MINERAL LANDS.—The Secretary of the Interior has rendered a decision that whenever, prior to patenting, it is discovered that land previously offered and entered as agricultural is really mineral in its character, the entry must be cancelled and the land reserved for entry under the laws especially applicable to mining lands. The issue was presented by the case of Smith Scoggin vs. Culver et al., involving a tract of 2,000 acres of land in Camden (Arkansas) district, which was purchased from the Government on private entry in April, 1878, but was subsequently found to contain argentiferous lead ores.

Close of the Volume.

With this number the MINING AND SCIENTIFIC PRESS closes its thirty-ninth volume. It has been so many years an exponent of the mining industry of this coast, that its position has long been recognized as one of the factors in mining and metallurgical progress. In both dull and prosperous times, during excitements and lulls, we have striven to uphold the interests of legitimate mining and disseminated such information as would be of value to our readers.

The copious index, which fills the last page of this paper, is a sufficient indication of the scope and variety of the subjects treated during the past six months, to convince any one of the trouble we have taken to collate miscellaneous technical information of every kind.

As far as mining matters are concerned we have kept track of developments in the mines, both great and small, of all districts on the coast, giving a page and a half of condensed news each week from the various districts. We have also kept close watch of all improvements in either mining or metallurgy; both at home and abroad, so that all our readers will know what others are doing in their own line. The mechanical industries of the coast have also received close attention and we have described all the mechanical improvements of note emanating from our shops and all the large machines made by them.

This journal is certainly worthy of the continued support of the progressive, industrial classes of this coast. It has long been with them and for them. The miners particularly ought to second our endeavors with subscriptions and correspondence. An improvement or benefit to one is an improvement and benefit to all, and we can tell all what one is doing.

The PRESS enters on its twentieth year with renewed vigor and strength. The long experience of its proprietors and editors in editing and publishing a technical journal must result in benefits to the readers, and all of our energy will be concentrated in making the PRESS a welcome weekly visitor to the mine and the shop. All that we ask is the co-operation and assistance of those to whose interests we are devoted, and we feel that both will be extended to us in the future as in the past.

California and the Comstock.

Because the quotations of stock of the Comstock mines come from San Francisco, and so many of the owners of the principal mines of that lode reside here, a great many people in the East have an idea that the "Comstock" is a sort of group of mines somewhere within the boundaries of California. It was only last week that a weekly paper, published in this city, in complaining of the use of the diamond drill on the Comstock lode, called on the Legislature of California to remedy the evil and make the Comstock miners, in Nevada, stop using it. In fact so intimate is the connection between the Comstock and San Francisco, that those who do not stop to think suppose it is a California institution.

In the East, with this impression, the present "deadness" of the Comstock is doing great injury to California. A good many think because the Comstock is nowhere in bonanza just now, that the whole bottom of California mining has dropped out, and they, therefore, turn their attention to Dakota, Colorado and Arizona to the neglect of California mines.

The evils of stock gambling are also cited against us, and eight out of ten Eastern people think our Stock Boards work principally on California mines, and that such mines are mostly stock-jobbing enterprises, with more paper than ore. They do not, in buying or investing, care to interfere with such properties.

The facts of the case are that very few California mines, indeed, are listed on the Stock Board, and those few mainly belong to Bodie, out of which district the brokers hope to see a second Comstock. The bulk of the mines in this State are worked by individuals or private companies, and for what they are worth, rather than for any fictitious value placed upon them in open market by brokers.

"The hills look green afar off," and people will always run after things at a distance in preference to better ones near at home. At the same time there is a certain set of people here who know good things when they see them, and these keep on the lookout for exceptionally rich mines within our own borders. That the California mining industry should bear the stigma of being a sort of grand stock jobbing enterprise is very unjust, since only a very small number of California mines are "dealt in" in our stock market.

BUTTE HYDRAULIC MINING CO.—Zotique Gervais has commenced suit in the Twelfth District Court to prevent the Directors of the Butte Hydraulic mining company from collecting an assessment of $10 per share on the capital stock, and also to compel them to render an account of their actions in the purchase of a dredging machine from the American Dredging company for $20,000, which machine is alleged to be utterly worthless. Gervais charges that the Directors of the Butte company were personally interested in the contract for the dredger, and in the purchase of it have defrauded the company.

Copper Rolling Mills Needed on this Coast.

There has never been a period during the existence of the mining industry of the Pacific slope in which a more propitious time could be found than the present for the establishment of rolling mills for the production of the various marketable forms of copper. The workings of the copper mines of the world have heretofore produced so large a supply as to greatly exceed the demand, and the result was seen in the reduction of the price, which placed a check upon them. But the demand has so greatly increased, owing to the enlarged requirement for articles of copper both in the arts and in domestic uses, that the price has already advanced over 40% for ingot copper, that being the form in which the metal is put upon the market, and from which all subsequent forms are produced; and the recent sales which have transpired in the Eastern markets, of copper to arrive in February, have been made at still further advance.

The copper mines of this coast, as has been shown in recent numbers of the PRESS, are now being brought into activity, and those now worked are producing an ample supply for extensive rolling works. On this score there need be no apprehensions of an insufficient yield to keep more than one large establishment fully employed. Prominent among the copper mines of this coast are the San Francisco Copper Co.'s mine; the Battle Mountain mine; the Newton copper mine; the Eagle copper mine, and several others. The San Francisco can produce about 60 tons per month of precipitated copper; the others could probably be wrought up to a similar quantity, if not to a greater amount. Besides those named there are many mines that would be worked to advantage if there was a home market for the copper or for the ore. The expense of sending the ore abroad to be reduced to metal has been, and still is, so great as to amount to a prohibition of shipping it, except in choice lots of exceptionally rich ore. Low grade ores would entail a loss to the shipper who should send them abroad; while if reduction and rolling works were established at some central point, even the moderate profits which accrue to the miners from their sale, would be a sufficient inducement for the continued development of the mines, more especially when the hope of obtaining a higher grade of ore was at all reasonable. The better price which they would obtain by the sale of the mats, or of the precipitats, at the reduction works, combined with the more speedy and economical character of the transit to them, would also conduce to a still greater activity in the mining department.

No one rolling mill would be able to work up all the metal that would be produced; this industry once inaugurated other mills would be called into existence to work up the accumulating copper. Nor would this be detrimental to the first in the field. The copper consumed on this coast would demand the full working capacity of several mills to supply the needed quantity. Even if an excess over the home demand should be produced, the inter-continental markets would be open to the producers, and they could be supplied at lower rates from this section than from elsewhere, on account of the facilities of production and the difference in freight charges.

Sheathing metal could be sold here at a much less price than now rules, and afford a fair business profit to the manufacturer; a reduction in its price would lead to an enlarged consumption; the same might be said with truth in regard to bolts, rivets and nails. Our factories and mines consume a large amount of rivets for their belting, and their sale alone would be a leading feature in the trade.

The field is a wide one, and as our industries thrive and our population increases, there must be a corresponding increase in the demand of manufactured copper. This branch of industry presents unusual attraction for the investment of capital, not only from the certainty of sale of its manufactures, with an increasing market, but also from the fact that the intrinsic value of the material used cannot deteriorate while the goods are on hand.

Arrangements are being made by which full details of the cost of constructing the furnaces and rolling mill, and the attendant expenses of running them, will be set forth in the columns of the PRESS, when those interested in the matter can see what the cost and profit both will be, and it is to be hoped that the enterprise will be regarded with favor by some of our energetic capitalists. If the work is conducted with proficient knowledge and rigid economy it cannot fail of being a success.

EDISON'S ELECTRIC LIGHT.—Edison gave a private exhibition of his newly invented electric light on Christmas eve. A Chicago *Journal* dispatch says: The workings of the light and lamp in the residence of Mr. Edison were completely successful, and people will be both astonished and gratified at the result of the public exhibition soon to be given. The successful operation of the light at Edison's residence makes it appear that matches will be things of the past in cities where the light becomes fairly established, while those who are manufacturing piping, chandeliers and globes, now necessary in the use of gas, must find other industries.

Working Auriferous Silver Ores.

[From Kustel's "Roasting of Silver Ores, Etc.," Second Edition.]

Ottokar Hofmann's Patent Process.

If rich auriferous silver ores, in which the percentage of gold is high, almost equal to that of silver, should be subjected to a chloridizing roasting, then impregnated with chlorine gas, leached with water, for the purpose of extracting the gold, and finally leached with hyposulphite of lime for the silver, it would in this case, although a high percentage of silver might be extracted, result in a yield of gold that would hardly amount to much more than about 50% more or less. The reason is not easily explained, the gold may be influenced somehow by the base metal chlorides during the roasting which prevent the gold from being attacked by the chlorine gas.

On the other hand, if the base metal chlorides, and the chloride of silver are extracted previous to the impregnation with chlorine, both metals—silver and gold—can be got out very close. On this fact is based O. Hofmann's gold and silver chlorination process, by which he successfully treated the gold and silver-bearing sulphurets of the Colorado No. 2, G. & S. M. Co., at Monitor, Alpine county, Cal.

The ore of Colorado No. 2, better known by the name "Tarshish mine," as it comes from the mine, is poor, assaying in average from seven to nine dollars per ton, but the gangue, being decomposed feldspar, causes the ore to be soft and easily crushed, and is by means of Frue's concentrators very high concentrated. The concentrated sulphurets consist of iron pyrites, silver glance, silver copper glance, fahlore, ruby silver, zinchlende and galena. The value of the concentration varies a great deal, ranging from $250 to $1,700 per ton, with over 40% of the value in gold, which is not free in the ore. The average value of five months' run proved to be $564 per ton—$333.19 in silver and $230.84 in gold.

The operations of the process are the following:

1. The roasting.—The concentrated sulphurets are subjected to a chloridizing roasting in a reverberatory furnace. These furnaces, although old-fashioned stirring furnaces, are considered by Hofmann preferable for this class of ores to any mechanical furnace in use, especially to the continuous discharging ones. Those concentrated sulphurets require a very perfect roasting, and the furnaces, with continuous discharge, do not give time enough for very high sulphureted ore to become thoroughly desulphurized. Such high-grade ores require close attention, and the process must be under perfect control of the roaster. However, it does not take near as much time as required by Plattner's gold chlorination.

After the ore has been roasted, it is spread on the cooling floor and sifted, when cold, through a sieve of ten to fourteen meshes to the running inch. The sulphurets are heavy enough after roasting to make very little dust during the sifting, so that the inconvenient moistening can be obviated. The lumps are saved till a larger amount accumulates, they are then pulverized in a dry battery and slightly roasted.

2. Leaching of base metals.—The roasted and sifted ore is charged into tanks with filter bottom, in quantities from two and a half to three tons, and leached with water to extract all soluble base chlorides. The water, if saturated with those base chlorides and some salt, of which generally some is left in the ore undecomposed after roasting, acts on the chloride of silver like a concentrated brine, dissolving the same. To prevent the escape of this dissolved part of silver, Hofmann does not admit the water from above the ore as is usually done, but from below the filter-bottom, which, by means of a slight pressure, is forced to ascent through the ore to the top of the vat. In this way the concentrated solution accumulates above the ore, and in diluting the same by a stream of water and permitting the solution to flow out through the filter-bottom, the chloride of silver is precipitated on and through the ore, which is then extracted with the balance of the silver. This operation affects the fineness of the bullion somewhat, if there is a considerable amount of lead in the ore, but not materially. The bullion of Colorado No. 2 has by this process a fineness of 957.

3. Leaching of the silver.—This is done as usually by leaching the ore with a solution of hyposulphite of lime, and precipitating the silver with polysulphide of calcium. The hyposulphite dissolves more or less gold, so that the bullion of Colorado No. 2 contains from two to ten thousandths of gold.

4. Second leaching with water.—After the silver has been extracted, the solution of the hyposulphite is allowed to run out till it disappears under the surface of the ore, when clear water is introduced again, in order to displace all solution. The desilvered ore is then removed from the tank to a dry kiln, where it is left for a time till the surplus water has evaporated. After this, it is charged back into the tank still moist. This second handling and drying cannot be avoided, as the ore after leaching is too wet to permit of a free passage of the chlorine gas, but if the works are arranged properly, this partial drying causes neither much delay nor much expense.

5. Gold extraction.—The gold in the ore is

now in metallic condition, and very bright and clean, permitting a very close extraction. The rim of the tank is provided with a groove, which is open towards the inside, two and a half inches deep and one and a half inches wide. In this groove fits the cover of the tank, leaving, however, a play of one-eighth of an inch around the circumference. The cover being made of one-inch boards, the staves of the tank will project one and a half inches above the cover. This arrangement serves in two ways—first, it facilitates the operation to make the cover air-tight with clay, and, second, it enables the chlorinator to keep a sheet of water one inch thick on the top of the cover, thus making the cover perfectly air-tight and preventing the escape of gas into the working-room during the time of charging the tank with water for the purpose of extracting the gold. The cover is, furthermore, provided with two pieces of one and a fourth-inch gas pipe, six inches long, and a square opening six by six inches. During the time of the impregnation of the ore with gas, these pipes are closed with balls of clay. As soon as the charge is ready for the extraction of the gold, these balls are removed and one of the pipes is connected with the hose of the water-tank, while the other by means of a hose either with another tank already prepared for chloridizing, or with the ash-pit of the roasting furnace. This is done to utilize the surplus of chlorine gas, and to protect the workmen from the very injurious effect of the same. Care must be taken to have sacks placed on the top of the ore right under the water pipe, and kept in place by two bricks to prevent the stream of water working into the ore. The square opening serves for examining the progress of the gas in the ore, and can be closed air-tight by a good fitting cover and clay.

The chlorine gas is generated in a leaden gas generator, which is not heated, as usual, by direct application of fire, but by steam. For this purpose the generator is placed into a tight-fitting box, leaving a space of two inches around the side and bottom for the circulation of steam. The rim and cover are kept outside the box. The steam enters on one side through a half-inch pipe, while the other side of the box is provided with a one-inch exhaust pipe and an outlet for the water.

Wherever steam can be had in a chlorination work, this arrangement will prove very convenient and useful. The operator has the temperature entirely under his control. The least turn on the valve increases or decreases the heat, and, of course, regulates the generation of gas. The discharge pipe of the generator projects a short way out of the box. On this pipe is fastened a piece of hose about two feet long, which can be closed with a thumb-screw clamp. The hose lies in a covered trough, which leads outside of the gas-house. In discharging the generator a small stream of water is permitted to flow through the funnel into the generator, by which the gas is forced through its usual outlet into one of the tanks. When the generator is filled, the stirrer is set in motion and the thumbscrew on the hose loosened. In this way the generator can be discharged without molesting or injuring the men. The cover of the generator is closed tightly with clay and only removed in case of repair.

The gas is conducted through a leaden pipe intersected with rubber hose alongside and in front of the tanks, almost in the same hight as the top of them. By means of a T and rubber hose, each tank is connected with the main pipe and can be disconnected by the use of a thumb-screw clamp. The pipe through which the gas enters the tank is independent from that one through which the solution discharges. It is placed higher and as close to the false bottom as possible.

After the gas has been the proper time in contact with the ore, the gold is extracted by water and precipitated in the usual way with sulphate of iron. The gold obtained is of extreme fineness, varying from 970 to 997 thousandths.

In treating very rich ores containing say $700 to $800 gold per ton, the solution carrying out the gold is of a very lustrous yellow color, and the precipitated gold accumulates on the bottom in spongy lumps of great specific gravity, some of them showing scales of bright gold, which under the microscope might prove to be crystallized gold. There is but very little more time used in leaching rich gold ore than poor.

If the ore is copperous, considerable copper will be carried out with the gold solution, coloring the same green. In order to save the copper, the solution, after the gold has been precipitated and settled, is decanted into the copper tanks. But before doing this it is advisable to draw the solution first into a second gold tank, in order to catch the gold which should accidentally be carried off with the stream, and to leave it there for some time to let the gold settle again.

Results.

To ascertain the working result of this process the concentrated raw sulphurets of the Colorado No. 2 obtained each day had carefully been weighed and assayed during a period of five months. The average value of these concentrations, as mentioned above, had been during said five months $564 per ton, with over 40 % in gold.

The total value of the bullion shipped at the end of this period, compared with the net value of the raw sulphurets worked during the same time, showed the actual working result to be silver, 96%, gold 95%.

The Main Triangulation of the U. S. Geodetic Survey.

The following is a synopsis of Prof. Davidson's lecture, delivered in the Independent Church last Sunday evening, Dec. 14th. It was listened to by a large audience, and was remarkably well received.

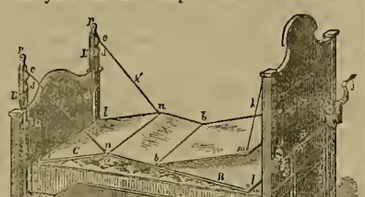
The work of triangulation across the continent, being carried on by the United States Coast and Geodetic Survey parties, has developed many interesting facts. The questions which arose in this survey have great usefulness. It not only connects the work of the Coast Survey on the opposite coasts and gives the exact difference of longitude, but it establishes a series of lines, points, etc., across the continent. These points are given by the Government to the different States as points to start State surveys, and these give standards for all measurements in the country. This is a decided advantage over our present custom, where there are thirty-eight systems for the thirty-eight States.

During the past summer, Prof. George Davidson has been engaged in this work in the high Sierra, and at a recent meeting of the California Academy of Sciences he explained the method of triangulation which is carried on.

In carrying forward the net-work of triangulation, it has been considered necessary to establish unusually long lines, much longer than any ever laid out in Europe or India. It was a question in the minds of many whether the work could be carried forward with greater accuracy on this account. It was also a question of economy.

In 1872 Prof. Davidson made examinations upon the feasibility of observing long lines from the Coast range to the Sierra Nevada in one leap. In 1876 he occupied Mt. Diablo and Mt. Helena as the fundamental line from the Coast range, and this year he occupied two stations in the Sierra Nevada.

The original base line, in Yolo county, 11 miles in length, will be the longest in the world. This year the heliotropes were observed over



Archer's Invalid Bed.

longer lines than in 1876, and under favorable atmospheric conditions the image of the sun, reflected by a seven-inch heliotrope, was seen at 160 miles with the unassisted eye. With the telescope these images, looking like stars, are seen through even the thick smoke of the Sacramento valley; and upon one occasion the heliotrope was seen on Mt. Shasta at 169 miles distant, when Lassen Peak at 96 miles could not be seen on account of smoke and haze. The longest line observed upon was 192 miles—from Mt. Shasta to Mt. Helena.

It is found at these great hights that the atmospheric disturbances arising from irregularities in refraction are much less than at less elevations.

The horizontal angles are measured with a 20-inch theodolite with fine telescope, and with microscope micrometers for reading the circle. To correct for systematic errors of graduation, the circle is placed in 23 different positions, and thus measurements start from that many zeros.

To obtain the true bearings of the lines of the triangulation diverging from a given station, observations are made upon a close circumpolar star whose azimuth is computed; these are connected with a night mark, and subsequently this mark is referred to all the lines, whose true bearings thus become known.

The latitude and longitude of any given station is determined, and by proper formulæ the latitude and longitude of every station in the network of triangles is computed, and the true direction of every line.

There are several peculiar phenomena in using the signals at these high stations. The observer, for instance, is at Mt. Round Top. At other stations are men with three-inch mirrors for lines of 60 to 70 miles, eight-inch mirrors for 160 miles, etc. One of these men directs the rays of the sun to a given point by means of his mirror, and these rays appear to those on Round Top as minute points. The beam reflected is about one one hundred and twenty-five millionth of the sun's rays. The signal would be one-thirtieth of a second in diameter, too small to be seen by any ordinary telescope. On account of the disturbance of the atmosphere, the signal is enlarged, and the smallest diameter observed is one or one and a half seconds, or about the same as a star of the fifth or sixth magnitude. The image when smallest would be completely covered by the spider lines of the smallest spider.

When the atmosphere is much disturbed, the signals appear remarkably enlarged, and instead of a variable speck, become 30 or 40 seconds in diameter and appear as spurious disks in the telescope. It takes skill to find the center of an object so large. At ordinary distances and at ordinary times the signals appear as a little bright speck, sometimes sparkling and generally reddish.

Over these great lines when the signals have passed through a stratum of air of varying density they have no longer the homogeneous light of the sun's beams, but this mass of air decomposes the ray as a prism would do. The light is decomposed into a spectrum, so that the signal shows as a vertical column of red, yellow and green, and not as a single spot.

To determine the position of Mt. Shasta was a very difficult job, on account of the difficulties of ascending and living there. On Shasta the rarification of the atmosphere makes it excessively oppressive. Only one of Mr. Colonna's party beside himself was able to stand it. This is the highest station to which an instrument has been carried—14,440 feet. From here Mr. Colonna observed upon the heliotrope at Mt. Helena, a distance of 192 miles, and the longest ever observed upon.

The quadrilateral to connect Algiers with Spain contains a line 188 miles, and they have been several years preparing for the work. The mountains are invisible a great time in the summer on account of the haze, but in the fall and winter can be seen. Instead of holdly placing men at stations to begin on the same day, each station is occupied to determine its latitude and longitude, and then the respective bearings of the stations are computed. Then a signal man is sent to the station to work on a given direction.

In the work of the U. S. Survey, however, great time was saved. The men go to a station, the instrument is directed to it, and the bearing obtained immediately. The work shows a rapidity of execution and progress having no counterpart.

Spring Tooth Harrow.

The accompanying cut represents an entirely new departure in the line of harrows. Its sale in the East has been unprecedented, and after

Batchelor's Spring Tooth Harrow.

three years of trial it is now in general use in the Eastern States and Canada. It is being introduced on this coast by Van Gelder, Batchelor & Co., 902 K street, Sacramento.

The teeth (see engraving) are nearly four feet long by two inches wide, and shaped like a rake tooth. They cut the soil instead of packing it, yield to anything solid instead of jerking the team, and lift the clods and grass to the surface, leaving mellow dirt about the seed. The depth of its work is controlled by moving the teeth. It is as thoroughly under control as a plow, and can be set to run from one to eight inches in depth. By turning it upside down, it can be moved about as well as a sled. The teeth stand so far from the frame that it seldom clogs. Their oscillating motion breaks more of the clods than other harrows, and shakes the dirt from the weeds, leaving them upon the surface with roots exposed. It cuts weeds instead of sliding around them. It cultivates the earth as thoroughly at the edge as at the center of its work; hence, there is no more necessity of lapping than with a plow. It cuts down elevations and fills depressions better than any other implement, thus saving the wear of mowers and other machines that follow.

WORKING MINES.—Under this heading the Phœnix *Journal* says: The sooner our people are made cognizant of the fact that mines are to be worked—not merely sold—the sooner will our chief industry and principal source of wealth rise to the importance that is properly due it. In California, Nevada and Colorado, for a long time, mines were chiefly worked with a view to speculation, rather than as a legitimate income to the owners. Mines were made to pay a dividend or submit to assessment as it was desired to make the stock go up or down. Mining superintendents worked under telegraphic instructions from New York or San Francisco, much as a train is run on a railroad by the "train dispatcher." Mines not on the stock board were not worked with a view to making them productive, but to make as large a hole as possible to sell some one else. Now, however, mining is being prosecuted, as we said in a recent article, as a means of money-making legitimately. Mines are now regarded as valuable for what they are actually worth when measured by the daily or monthly results in bona fide production.

Archer's Patent Invalid Bed.

Mr. James H. Archer, of this city, has recently patented through the MINING AND SCIENTIFIC PRESS Patent Agency, an improved invalid bed, of which we give an illustration on this page. By certain mechanical attachments to the bedstead, it may be elevated, tilted or adjusted to accommodate the invalid.

A represents the bedstead of the ordinary type, to which the bed bottom, made in a peculiar manner, is adapted. The side frames of the bed bottom are hinged as shown at *a*, so as to form the bed bottom into two parts *B*, *C*, the head part, *B*, being somewhat larger than the lower or foot part. A supplemental leaf, as shown, is hinged to the side frames of the bottom as shown at *b*, so it may be used for elevating the patient's head.

At each corner of the bedstead is a folding adjustable standard, E, pivoted to the bedstead, so as to fold down out of the way when desired.

On the upper end of each standard are pulleys, *d*, *e*, and near the lower ends of each, attached to the bed frame, are the leading pulleys, *f*, those at the head being double.

On the back of the head board is a roller, *F*, with a ratchet, *s*, and pawl, *g*, at one end, and a gear, *h*, and pinion, *i*, at the other; a crank, *j*, being used to rotate the roller. Attached to this roller at opposite ends are cords for raising the bed bottom.

The cords, *K*, for raising the corners of the head end, lead from the roller down under the leading pulleys, *f*, and then over the lower pulleys, *d*, and over the upper pulley, *d*, through and over the upper pulley, *e*, and then down to the corners of the bed bottom.

The cords, *K'*, lead from the rollers down under the leading pulleys, *f*, lengthwise the bed to the corresponding ones at the other end of the bed; thence upward between the rollers, *d e*, and over *e* down to the foot corners of the bed bottom.

At each corner of the bed bottom is a curved link or hook, *l*, with which the knotted end of the cord will engage. By turning the crank therefore, the cords leading through the pulleys as described, will raise the bed bottom up by the corners to any desired hight and the ratchet and pawl will prevent its lowering and hold it in place. The cords at either end or side may be disengaged and only one end or side raised when desired.

On the upper ends of the supplemental hinged leaf are placed links or hooks, *m*, into which the knotted ends of the head cords, *K*, may be caught, so that this supplemental leaf may be raised to any angle or inclination desired by the patient.

Corresponding hooks, *n*, are on the part, *C*, of the bed bottom and by placing the knotted ends of the cords, *K'*, on these hooks, the lower end or foot of the part, *C*, may be dropped so it will set at an angle to the part, *B*, and still be retained by the foot-cords, *K*. This part may be more or less elevated for raising the knees of the patient.

Clamps, *G*, having set-screws, *o*, are arranged at the corners of the bed to keep the hinged standards in an upright position, and when desired by removing the set-screws, the standards may be folded down out of sight and the crank and roller may also be removed.

The bed bottom is intended to be placed on top of the mattress, and heavy canvass or webbing is used in its construction.

A sitting position may be maintained by raising the supplemental leaf by means of the cords, and also raising the part *C* by its hooks, when the part *C* and leaf will be at an angle.

When it is desired to raise the upper portion of the body from the hips, the supplemental leaf only may be elevated.

Either side may be raised by detaching the ropes on one side and raising the other, so the patient may easily be removed from the bed, or he more readily turned over.

For persons afflicted by rheumatism, when head and feet are both elevated very high, the foot of the bed may be raised up as desired and the supplemental leaf also, and the bed bottom assume an U shape, so the bed will touch all parts of the back and lower limbs.

The upper ends of the standards, above the pulleys, are extended and holes, *p*, formed through them, through which the cords may be passed for tying to the corners of the sheet, so as to sustain the patient when the sheets are to be changed and bedding removed. In order to do this, the bed bottom is raised up by the roller and cords to its highest point on the standards. Then by reversing the rollers the bed bottom, *B C*, will be lowered down, and the patient be left suspended in the sheet until the bedding can be changed. The bed bottom is then raised up to the patient, the corners of the sheet released, and the patient is lowered to the desired position again. The side of the bed is then raised, the patient is turned, and the soiled sheet, on which he has been suspended, is removed. In this way the bedding is changed without inconvenience to the patient, and the operation may be rapidly performed.

The bed bottom may be raised half way up at any time, and air allowed to circulate under it in warm weather. When suspended in this way, persons may rock themselves by pushing with the foot against the foot-board, or the bed bottom may be rocked to and fro, to put a child to sleep, the same as in a hammock; the bed is therefore adapted to persons in good health who wish an easy position as well as it is to invalids.

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Under the beading of the first chapter, "Testing Ores for Silver," we find paragraphs on ore formation test for silver, with heat aud water, acid or blow pipe. In speaking of testing for a process, the extent aud richness of ore is considered, smelting ores, selecting and working sample, appliances for testing, roasting, etc. Under the head of "Working Ores" the author describes Aaron's procese, has something to say of superheated steam, preparation of dichloride of copper aud protochloride of copper, use of copper and iron, quantity of chemicals, carbonate of lime, chloride ores, amalgam, Patchen's procese, etc. He also describes the methode of working roasted ores, treatment of hase metals, stirring, heat of furnace, want of sulphur, etc. Under the head of "Leaching Processes" are the titles, Smelting, Mexican process, Chilean process, Kroehnke's process, etc. Under "Pulverizing Machines" are described the arastra aud its construction and operation, stamp batterice, screens, Crocker's trip-hammer battery, Paul's pulverizing barrel, Kendall's battery, Noice's pulverizer, a cheap rock breaker, etc.

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He describes an improvised retort, roasting furnace, furnace tools and furnace building. Among the miscellaneous mention may he found Aaron's leaching apparatus, with two or three different arrangements, a small mill, eampling tailings and settling tanks, dichloride of copper, etc. Mr. Aaron is a practical miner, of long working experience on this coast.

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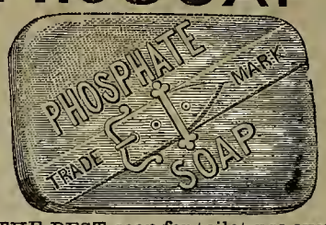

THE BEST soap for toilet use ever manufactured. BEST because it contains all the excellencies of the most expensive foreign or American soaps without their defects. BEST because it combines strength with delicacy in such a way that its strong detersive qualities do not injure the skin. BEST because it is the result of years of study and experiment in the soap manufacturing business, assisted by modern chemical discoveries. BEST because it contains ingredients beneficial to the skin, which unite chemically with the soap in such a manner as to increase its saponaceous qualities. Every chemist familiar with soap manufacture knows that some ingredients which are in themselves beneficial to the skin cannot be saponified; some are partially neutralized, while others injure the quality of the soap. There are soaps in the market which are to some extent beneficial to the skin, but they are inferior articles for toilet use. PHOSPHATE SOAP is the ONLY article offered to the public which combines all the best elements of toilet soap with medical ingredients beneficial to the skin.

If you wish to make your hands soft buy a cake of PHOSPHATE SOAP, and when that is gone you will buy a dozen and recommend your friends to do the same.

Ladies who wish to make the skin look beautiful and natural should use PHOSPHATE SOAP.

For chapped hands the constant use of PHOSPHATE SOAP will be recommended by all who give it one fair trial.

TESTIMONIALS.

SAN JOSE, September 24, 1879.

To the Standard Soap Co.—Gentlemen:

It affords me pleasure to say to the public that I have used and prescribed your PHOSPHATE SOAP as a remedy in various forms of cutaneous diseases with the happiest results. I am of the opinion that it is the mildest and most perfect detergent that can be used, either for cleansing the skin and leaving it soft and healthy, or for removing the fetor and corroding influences of sores and ulcerations. I should be sorry to be without it in shaving my face or making my toilet, to say nothing of my good opinion of its remedial qualities.

A. J. SPENCER, M. D.

SAN FRANCISCO, Aug. 27, 1879.

Gentlemen:

I received a package of your soap (Phosphate Soap) and it gives me great pleasure to testify as to its superior excellence. As a toilet soap I have never seen anything to surpass it. It also possesses superior remedial qualities. I have used it in two cases of obstinate skin disease, one of intolerable itching, *Pruritus*, the other an *Eczema*. In both great relief was obtained. Its emollient properties are remarkable. Respectfully,

W. A. DOUGLASS, M. D.,
126 O'Farrell St.

To the Standard Soap Company.

SAN FRANCISCO, July 19, 1879.

Standard Soap Co.—Gents:

I have tried your PHOSPHATE SOAP, and have no hesitation in saying that it is the best toilet soap I ever used. My wife has used it and is of the same opinion. I have paid as high as fifty cents per cake for an article in every respect inferior to what you sell for twenty-five cents. HENRY H. LYNCH,
515 Haight street.

The genuine merits of PHOSPHATE SOAP and persistent advertising will force every druggist, groceryman and general dealer to order it by the gross sooner or later. Ask for it in every store. The retail price is 25 cents per cake. We wish to sell it only at wholesale, but in case you cannot find it we will send a nice box of three cakes by mail, postage paid, on receipt of 85 cents in stamps.

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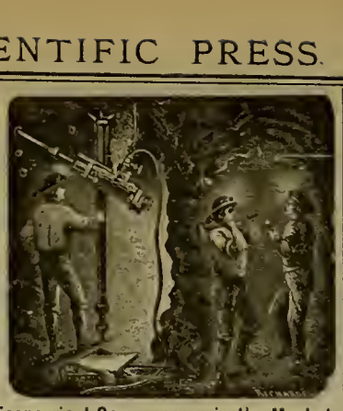

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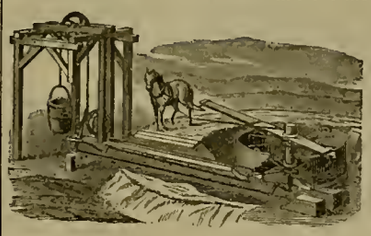

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The Power is mainly built of wrought iron, and cannot be affected by exposure. The hoisting-drum is thrown out of gear by the lever, while the load is held in place with a brake by the man tending bucket. The frame of the Power is bolted to bed-timbers, thus avoiding all frame work. When required these Powers are made in sections for packing.

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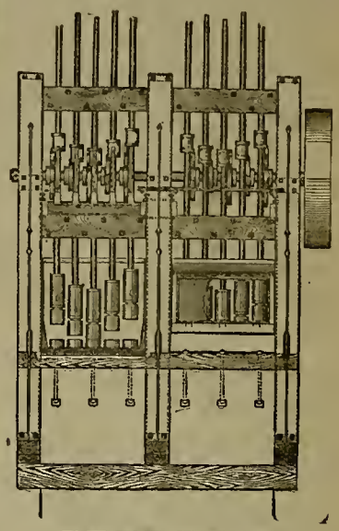

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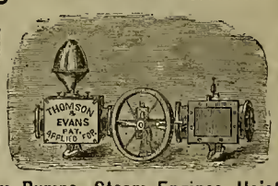

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CONTINUED FROM PAGE 413.

crops out for a distance of 1,000 ft. The ore will yield about $30 per ton silver.

MINING NOTES.—Willard Rice, recently from the Silver Belt, informs us that the mine is looking first-rate. Bob Groom has recently discovered a fine ledge on Castle creek, which gives by assay $320 gold per ton and 40% copper. Mr. Worthington has located some valuable copper claims, and is perfecting arrangements for the erection of a custom mill, on Tule creek, near the Pearl mine, in a northeasterly direction from Tiptop. Another shipment of Silver Belt bullion will be made in a few days, making a total of ten tons for the month, worth about $900 per ton.

SILVER CLOUD.—Tombstone *Nugget*, Dec. 18: Since our last report on the Silver Cloud mine, situated in the Dragoon mountains, and belonging to Frank Wallace, J. B. Allen and Mr. Blair, the work has progressed steadily, the lime capping taken off, revealing an ore body; the ledge showing seven ft in width, pitching into the hill. Specimens of horn silver from the mine we have seen this week, which will assay $3,000 to the ton, and some selected rock will go as high as $10,000. On Monday last, two tons of the ore taken from the shaft was shipped to San Francisco, to Moore & Parish, which is expected will yield $3,000 to the ton at least, although it is claimed it will go higher. A sufficient amount of work has not yet been done to determine the quantity of this rich ore body fully, and it would seem almost impossible that its present richness could continue to a great depth, yet it may, and mining experts who have visited it express great confidence in the value of the deposit, and the surroundings indicate permanency. We shall watch the progress of the work with a great deal of interest.

ALASKA.

THE STEWART LODE.—Olympia (Wash. Ter.) *Transcript*, Dec. 13: This lode is said to yield ore assaying from $200 to $3,000 per ton, and growing richer as greater depth is attained. A 40-horse power engine has been taken up, and will be used with the mill for crushing. The company is composed of Portland men, who expect to make a big thing out of their venture.

COLORADO.

THE REPUBLIC.—*Register*, Dec. 19: This company, recently organized on the Pewabic lode, have lowered the water in the Porrin shaft to a point 200 ft from the surface. There remains about 65 ft of water, which is being removed rapidly.

HASELTINE.—A new and rich strike has been made in the tunnel on the vein of the Haseltine lode, some 460 ft from its entrance. The ore vein, clear mineral, is fully four inches wide, and is of a much better character than any heretofore found in any of the workings along the line of the lode. The crevice matter in the bottom of the pump shaft has also materially changed for the better in the last few feet sunk. The water is very troublesome, but so far has been handled by means of the four-inch Cornish pump recently put in. The last lot of ore smelted gave a return of $155 per ton.

COOPER.—The Cooper lode, north of the Topeka, has been leased by Major Hal Sayr to a party of Welsh miners.

LEAVENWORTH.—The Wyandotto company have erected a large and commodious shaft house over their Leavenworth property, and are making a new plant of machinery in the building.

RICH DISCOVERIES.—Georgetown *Courier*, Dec. 13: Some very rich discoveries were made late in the fall in Daily district, which, according to report, bid fair to equal anything previously discovered in Clear Creek county. The ore body, which is several ft in thickness, is composed of quartz carrying fine particles of black mineral, which must be either silver glance or brittle silver (stephenite), for selected specimens assay from 4,000 to 6,000 ounces, and the whole body will probably mill 200 ounces.

CLEAR CREEK ITEMS.—The Georgetown *Courier* brings the following items of interest from the Silver Queen and vicinity: The shipment of ore from the Tropic mine, on Seaton mountain, is being constantly increased. The ore returns 125 ounces in silver, one-half ounce in gold, and from 2% to 7% copper. A strike of very rich ore was made in the Pay Rock mine lately. A new vein, from one and a half to two inches in thickness, was opened up, which is composed of nearly solid silver glance that assays 15,580 ounces per ton.

THE MONUMENTAL MINE.—Portland *Oregonian*: Several gentlemen connected with the Monumental Gold and Silver mining company returned to this city recently from the mines in Grant county, and bring important information concerning the progress made there. The new quartz mill, said to be the finest on the Pacific coast, was put in operation on Nov. 11th and run on waste ore. They suffered two or three break-downs, usually incident to starting new machinery, which delayed the regular work on good ore until the 17th. On that day they worked 12 hours on good ore. An assay was made from the battery and showed $122.40 to the ton, which is $33 better than Com. Virginia during its bonanza days. There are 600 tons of ore on the dump as good as that crushed on the 17th. The ore is the accumulation of two years' development in the tunnel and drifts. A shaft has been sunk from tunnel level, the bottom of which is 340 ft from the surface. Specimens of average ore brought by Mr. J. W. Stemme from this depth, show richer quartz than has ever been found in the mine before, and warrant a permanency which assures a golden future for its owners. The lucky owners, among whom are Messrs. Stemme, Alisky, Knott Bros., James D. and Charles S. Miller, Wm. Grant, Isaac Kaufman, F. C. Sels, C. P. Church, and others, are entitled to great credit for their enterprise in carrying this costly undertaking to a successful conclusion. Not less than $200,000 have been expended by the Monumental company to bring this mine to its present development. The Secretary, C. D. Folger, remains behind and will accompany the first shipment of bullion to this city. Mr. Stemme and Mr. Knott stayed by the mill until everything seemed to be running satisfactorily, and started for here, where urgent business called them. They are enthusiastic over the prospect and confident of its future.

MINING ITEMS.—The miners of Josephine county are actively engaged in preparing for the winter run. A strike of very rich ore was made a few days since on the Charles Wain lode, summit of Mt. Estes. McDonough, Kahler & Co. propose running a ditch from the lower end of McDonough's field to their mines near Fort Lane, which will be about a mile long. The Similkameen mines, up near the British line, are being thoroughly prospected, and give promise of yielding great wealth. A company with large capital has been organized, and will engage next season in working the diggings on a large scale. There are about twenty men at Silver creek at present who propose to remain during the winter and thoroughly prospect that region. More mining will be done during the next season than for many years past, providing, of course, that there is plenty of water.

NEW MEXICO.

THE MOGOLLONS.—*Grant County Herald*, Dec. 13: J. C. Cooney, of the Mogollons, informs us that over one hundred locations have been made in his district, and that fifteen mines are in course of development and are showing metal. The work upon his mine is by tunnels, in one of which the foot wall of the vein has been reached, and twelve ft of work done in the metal without reaching the hanging wall. Both walls are well defined in the shaft above. The ore assays from 100 ozs. to 7,000 ozs. in silver, and carries from 30% to 60% of copper. Mr. Cooney shows some wonderfully rich specimens.

STARTED UP.—Meredith & Ailman have started up their new smelter erected at their works on the Mimbres, below Georgetown. Twenty-five tons of first-class ore had accumulated when the smelter was completed, and the returns of the first seven tons were something over 800 ozs. per ton. They are working on the remaining eighteen tons, and meantime have struck it richer than ever in their Naiad Queen mine. They are taking out first-class ore from each ton, of which they can pick several hundred pounds, running up to 2,000 ozs,

OREGON.

ITEMS.—Jacksonville *Sentinel*, Dec. 17: The English company, on Oalice creek, is now piping with about 1,000 inches of water. K. Kubli has just finished a lot of hydraulic pipe for Messrs. Hayes & Magruder, above Rock Point on Rogue river, and that company commenced to pipe last Saturday with every prospect of success. The Blue Gravel company, on Oalice creek, are running with a good head of water. More snow seems to have fallen in that locality than elsewhere in southern Oregon. The supply of water is yet limited. Two pipes are now in use at Chinaman Lin's mine, on Applegate, with prospects favorable for a continuance of their supply of water during the winter. Lin employs twenty hands in the working of these mines. Sturgos, Beckner & Co. purchased the remainder of the ground lying at the mouth of Poorman's creek and the forks of Jackass creek. They now own a continuous stretch of about two miles of that creek, and are ground-sluicing at present with a very good head of water. McKnight & Ooldworthy, of Foot's creek, are adding more pipe to their hydraulic at that place, so as to enable them to work their mines on an extensive scale this winter.

UTAH.

STORMONT BULLION.—Silver Reef *Miner*, Dec. 13: During the month of November the Stormont mill turned out $46,589 in bullion finer than coin. The yield would have been several thousands in excess of this amount but for the recent storms, which not only put the road in bad condition and delayed the delivery of ore, but also stirred up the sand in the river bottom to such an extent that the ditch, whose waters supply the mill with its motive power, was partially filled up with it, causing a suspension of mill operations for about 50 hours. It is not unlikely that the bullion output of the present month will exceed that of last month $10,000. A new retort-house is in course of erection at the Stormont.

News in Brief.

SAMUEL PERKINS, Chief Justice of the Supreme Court of Indiana, is dead.

BY an explosion in Wurtemberg twelve miners were killed and eight injured.

A FALLING tree killed a man named Boovenhauser on the Coquille river in Oregon.

AN immense meeting of the free-traders was held last Thursday at Rochdale, England.

BUT small hopes of the recovery of the Czarina are entertained at St. Petersburg.

THE President has nominated Col. John C. Williams to be Consul at Swatow, China.

GENERAL MARRIAT, President of the European railroad administration in Egypt, is dead.

PARNELL and Dillon, the Irish agitators, sailed from Queenstown for New York, Sunday.

A SCHOONER arrived at Halifax reports having been chased by a pirate in West Indian waters.

A NUMBER of persons have been imprisoned in Mazatlan, accused of conspiring against the State.

TIMOTHY SULLIVAN was killed on the 17th instant, at Virginia, Nev., by falling down a shaft.

FRIGHTFUL mortality prevails among the Mussulman refugees at Rustchuck and Philippopolis.

ONE Chicago firm recently discharged 2,000 pork packers for refusing to work with non-Union men.

THE printers of Denver struck for an advance in the price of composition, and their demand was acceded to.

SENATOR CAMERON, of Pennsylvania, has been chosen chairman of the National Republican Committee.

THE evicted tenant who cudgeled a nobleman at Limerick lately has been sentenced to five years' servitude.

A DISPATCH from Quebec announces the death of three persons in a burning court-house and the injury of two others.

GEORGE M. PINNEY has sworn out a warrant for the arrest of C. F. McGlashan, of the Truckee *Republican*, for libel.

ILLICIT distillers recently attacked a party of Revenue Collectors in Georgia, wounding all of them, but were finally repulsed.

THE net earnings of the Lake Shore and Michigan Southern railroad during the past year aggregated $6,280,000.

A STAGE coach was precipitated down an embankment seventy feet high, recently, in Bowlder canyon, Col., killing the driver.

CHICAGO has been chosen as the place for holding the next Republican National Convention, and June 3d fixed upon as the time.

A PETITION asking for the expulsion of the Mormon, Cannon, from his seat as delegate from Utah, has been received at Washington.

THE vein of platinum reported to have been discovered in South Grantville, Washington county, New York, causes great excitement.

JUDGE MORRISON has rightly decided that women are entitled to enter Hastings' Law College on the same footing and with the same privileges as men.

TWO miners were smothered by foul air in the Quandray mine, Utah, Monday afternoon. Their names were Harry Laley and James Andre; the last-named went to the rescue of Laley, and lost his life in the attempt.

THE WORKSHOP COMPANION.—We have received from the publishers, the Industrial Publication Company, of New York, a useful little work with the above title. Its contents comprise a collection of useful recipes, rules, processes, methods, wrinkles and practical hints for the household and shop, published at the low price of 35 cents. The book covers a wide range of subjects, there being no less than 90 main articles, some of which contain as many as 60 sub-headings. The pages are of good size and closely printed in very clear type, so that 164 of them contain an unusual amount of matter. The subjects are arranged alphabetically, the work thus forming an encyclopædia of practical, everyday information.

THE BANK of Virginia has suspended, and a creditor has attached the concern.

PATENTS AND INVENTIONS.

List of U. S. Patents Issued to Pacific Coast Inventors.

[From Official Reports for the "Mining and Scientific Press," Dewey & Co., Publishers and U. S. and Foreign Patent Agents.]

FOR THE WEEK ENDING DECEMBER 16TH, 1879.

222,670.—ROCK CRUSHER—E. Coleman, S. F.
222,688.—GRAIN SEPARATOR—A. Fugel, Clayton, Cal.
222,584.—BUCKLE—J. H. Goldstein, S. F.
222,708.—OVERALLS—C. A. Jones, S. F.
222,758.—BINDER—G. Wedel, S. F.
222,760.—VALVE—F. Woodward, S. F.
2,161-2,162.—BITTERS—Label—H. J. McCormick, Portland, Oregon.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

I. S. KALLOCH, Mayor of San Francisco, has had the second and last bullet successfully extracted from his body. It was in the fleshy part of his arm just below the armpit, and had lain there since last August.

A GOOD COMPANY.—In another column appears an advertisement of the well-known fire and marine insurance firm, Hutchinson & Mann, of California street. They represent twelve companies, with an aggregate capital of $23,000,000.

AN official decree in France pardons 150 more Communists.

An Engineer

Wants a situation to run a stationary engine in the city or country. Will accept a moderate salary. Address "No. 1," this office.

A Cylinder Pressman

Of good experience wants a situation in a S. F. or interior office. Understands running an engine. For a steady situation will accept moderate wages. Address "No. 2," this office.

BOUND VOLUMES OF THE PRESS.—We have a few sets of the back files of the MINING AND SCIENTIFIC PRESS which we will sell for $3 per (half-yearly) volume. In cloth and leather binding, $5. These volumes, complete, are scarce, and valuable for future reference and library use.

FRESH attractions are constantly added to Woodward's Gardens, among which is Prof. Oruber's great educator, the Zoographicon. Each department increases daily, and the Pavilion performances are more popular than ever. All new novelties find a place at this wonderful resort. Prices remain as usual.

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription, and request that they circulate the copy sent.

EXTRA COPIES can usually be had of each issue of this paper, if ordered early. Price, 10 cents, postpaid.

Chew JACKSON'S BEST Sweet Navy Tobacco

METALS.

(WHOLESALE.

WEDNESDAY M., December 24, 1879.

IRON.—	
American Pig, soft, ton	28 00 @35 00
Scotch Pig, ton	26 00 @30 00
American White Pig, ton	25 00 @— —
Oregon Pig, ton	28 00 @35 00
Refined Bar	4 @ 3
Horse Shoes, keg	5 00 @— —
Nail Rod	—@ 8
Norway, according to thickness	7 @ 8
COPPER.—	
Sheathing, lb	22 @— —
Sheathing, Yellow	18 @— —
Sheathing, Old Yellow	8 @— —
Nails	25 @— —
Bolts	24 @— —
Brazier's, in all sizes	24 @ 30
Old	16 @— —
STEEL.—	
English Cast, lb	16 @ 17
Black Diamond, ordinary sizes	15 @— —
Drill	16 @ 17
Flat Bar	16 @ 19
Plow Steel	8 @ —
TIN PLATES.—	
10x14 I C Charcoal	8½@ 9
10x14 I C Coke	7 @ 7
Banca Tin	18 @— 20
Australian	15½@ 17
ZINC.—	
By the Cask	9 @— —
Zinc, Sheet 7x3 ft. 7 to 10, lb, less than cask	9½@— 10
NAILS.—	
Assorted sizes	3 50@4 50

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by SUTRO & Co.]

SAN FRANCISCO, December 24, 3 P. M.

SILVER, ¼ par.
GOLD BARS, $30@910. SILVER BARS, 10@18 ⅌ cent. discount.
EXCHANGE on New York, 20, on London bankers, 49½@49¾. Commercial, 50; Paris, five francs ⅌ dollar; Mexican dollars, 93@95.
LONDON Consols, 97 5-16; Bonds (4%), 106½.
QUICKSILVER in S. F., by the flask, ⅌ lb. 37½@38c.

Signal Service Meteorological Report.

SAN FRANCISCO.—Week ending December 23, 1879.

HIGHEST AND LOWEST BAROMETER.

Dec. 17	Dec. 18	Dec. 19	Dec 20	Dec. 21	Dec. 22	Dec. 23
30.034	29.997	29.671	29.975	30.164	30.119	30.389
30.005	29.844	29.437	29.718	30.036	30.057	30.158
MAXIMUM AND MINIMUM THERMOMETER.						
53	57	59	52	53	51	44
45	50	51	46	43	42	37
MEAN DAILY HUMIDITY.						
83.3	80.7	87.3	80.3	76.7	08.7	40.7
PREVAILING WIND.						
N	SE	SE	SW	SW	NW	N
WIND—MILES TRAVELED.						
92	157	429	309	145	171	338
STATE OF WEATHER.						
Fair.	Cloudy	Cloudy	Fair.	Fair.	Fair.	Clear.
RAINFALL IN TWENTY-FOUR HOURS.						
	.04	1.55	.11	.42	.20	

Total rain during the season, from July 1, 1879, 9.07 in.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Aurora Mining Company—Location of

Principal place of business, San Francisco, California. Location of works, Iowa Hill, Placer County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the third day of December, 1879, an assessment, No. 1, of ten cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at the office of the Company, No. 28 Sansome street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Third day of January, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the 19th day of January, 1880, to pay the delinquent assessment, together with cost of advertising and expenses of sale. By order of the Board of Directors. P. CONKLIN, Secretary.

Office, 28 Sansome Street (up-stairs) San Francisco, Cal.

Butte Hydraulic Mining Company.—

Location of principal place of business, San Francisco, California. Location of works, Butte County, Cal.

NOTICE.—There are delinquent upon the following described stock on account of assessment (No. 2) two levied on the Thirty-first day of October, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
E Poirson	13	2½	$25 00
L Lapierre	22	2½	25 00
H Marcoux	24	2½	25 00
J B Lussier	25	2½	25 00
John Britt	26	2½	25 00
Geo W Deitzler	37	5	50 00
N Desantelle	41	2½	25 00
Jos Lucier	42	2½	25 00
N Ooldtree	43	7½	75 00
Geo Moreau	44	5	50 00
Z Gervais	45	10	100 00
Geo Moreau	46	5	50 00
Geo W Deitzler	47	15	150 00
A S Hawes	17	10	100 00
J Callaudreau	4	10	100 00
A M Wilder, Trustee	1	10	100 00
A L Lengfeld	5	5	50 00
L L Dennery	6	5	50 00
W E Lutz	7	5	50 00
Geo. H. Powers	11	5	50 00

And in accordance with law and an order of the Board of Directors made on the 31st day of October, 1879, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the company, room 3, No. 220 Sansome street, San Francisco California, on Monday, the 22nd day of December, 1879 at the hour of 10 o'clock A. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

L. L. DENNERY, Secretary.

Office, room 3, No. 220 Sansome St., San Francisco, Cal.

POSTPONEMENT.—By order of the Board of Directors, the above sale of delinquent stock of the Butte Hydraulic Mining Company is postponed to the Fifth day of January, 1880, at 10 o'clock A. M.

L. L. DENNERY, Secretary.

Gover Mining and Milling Company.—

Location of principal place of business, San Francisco, California. Location of works, Amador County, near Drytown, California.

Notice is hereby given that at a meeting of the Directors held on the 24th day of December, 1879, an assessment (No. 40) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 402 Front street, room 8, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the second day of February, 1880, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Monday, the First day of March, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

W. O. WILSON, Secretary.

Office—402 Front street, room 8, San Francisco, California.

Mariposa Land and Mining Company of

California.—Location of principal place of business, San Francisco, California. Location of works, Mariposa County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 10th day of December, 1879, an assessment (No. 17) of Fifty (50) cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. currency to the Secretary, at the office of the company, room 33, Nevada block, No 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 10th day of January, 1880, will be delinquent and advertised for sale at public auction; and unless payment is made before will be sold on the 2d day of February, 1880, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. LEANDER LEAVITT, Secretary.

Office—Room 33, Nevada Block, No. 309 Montgomery St., San Francisco, California.

Numa Mining Company.—Location of Prin-

cipal place of business, San Francisco, California. Location of works, Humboldt County, Nevada.

NOTICE.—There is delinquent upon the following described stock on account of assessment (No. 2) levied on the 23d day of October, 1879, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount
Alexander, E W	43	2000	$40 00
Blasdel, E W	15	250	5 00
Blasdel, E W	16	250	5 00
Blasdel, E W, Trustee	27	500	10 00
Blasdel, E W, Trustee	28	500	10 00
Blasdel, E W, Trustee	30	500	10 00
Blasdel, E W, Trustee	31	500	10 00
Blasdel, E W, Trustee	45	250	5 00
Blasdel, E W, Trustee	46	250	5 00
Blasdel, E W, Trustee	47	500	10 00
Blasdel, E W, Trustee	49	500	10 00
Blasdel, E W, Trustee	50	2500	50 00
Blasdel, E W, Trustee	51	4000	80 00
Blasdel, E W, Trustee	64	250	5 00
Brown, George A	42	500	10 00
Burns, A M	23	7500	150 00
Burns, A M	55	500	10 00
Burns, A M, Trustee	56	2500	50 00
McKusick, H J	44	4000	80 00
Merry, D B	65	500	10 00

And in accordance with law and an order of the Board of Directors, made on the 19th day of November, 1879, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, 328 Montgomery street, room 21, San Francisco, California, on Monday, the Twelfth day of January, 1880, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale

DAVID WILDER, Secretary.

Office—328 Montgomery St., room 21, San Francisco, California.

Land Purchasers' Association.—Office,

No. 318 Montgomery street, San Francisco, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment, (installment No. 43), levied on the 5th day of November, 1879, the several

amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares	Am't.
James E Boyce	No cert. issued	1	$6 00
V Chevalier	No cert. issued	1	6 00
John A Collison	20	1	6 00
David S Hutchinson	251	1	6 00
Mrs M A Hutchinson	252	1	6 00
Chas Lemon	170	2	12 00
Mrs N McCarty	No cert. issued	1	6 00
Mrs W W Newell & D Hicks (guardians)	242	1	6 00
Mrs W W Newell & D Hicks (guardians)	248	1	6 00
Mrs W W Newell & D Hicks (guardians)	247	8	48 00
F A Rouleau	250	3	18 00

And in accordance with law, and an order of the Board of Directors, made on the 5th day of November, 1879, so many shares of each parcel of said stock as may be necessary, will be sold at public auction at the office of the Secretary, 318 Montgomery street, San Francisco, California, on Saturday, the third day January, 1880, at the hour of one o'clock, P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

C. S. WRIGHT, Secretary.

Office, 318 Montgomery street, San Francisco, Cal.

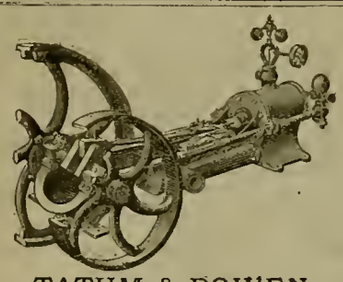
ANNUAL MEETING.

NORTHERN LIGHT GOLD AND SILVER MINING Company. The annual meeting of the stockholders of the above-named Company, for the election of Directors, and the transaction of any other business that may properly come before it, will be held on MONDAY, the 5th day of January, 1880 (first Monday in January), at the hour of one o'clock P. M., on that day, at the office of the Company in this city, Room 30, No. 310 Pine street, San Francisco, Cal. Transfer Books will be closed Monday, December 22d, 1879, at three o'clock P. M. F. S. MONROE, Secretary.

DIVIDEND NOTICE.

Office of the EUREKA CONSOLIDATED Mining Company, Nevada Block, Room No. 37, San Francisco, December 15th, 1879. At a meeting of the Board of Directors of the above-named Company, held this day, a dividend (No. 50) of Fifty Cents per share was declared, payable on SATURDAY, December 20th, 1879. Transfer Books closed until the 22d inst.

W. W. TRAYLOR, Secretary.



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CHAS. H. GOODWIN.....Assistant Treasurer.
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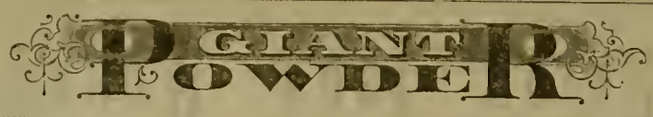

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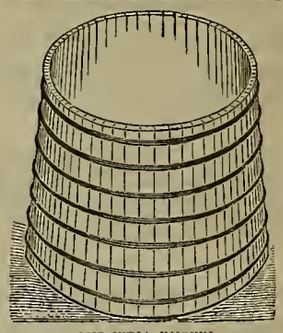

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This paper is printed with Ink furnished by Chas. Eneu Johnson & Co., 509 South 10th St., Philadelphia & 59 Gold St., N. Y. Agent for Pacific Coast—Joseph H. Dorety, 120 Sutter St., S. F.

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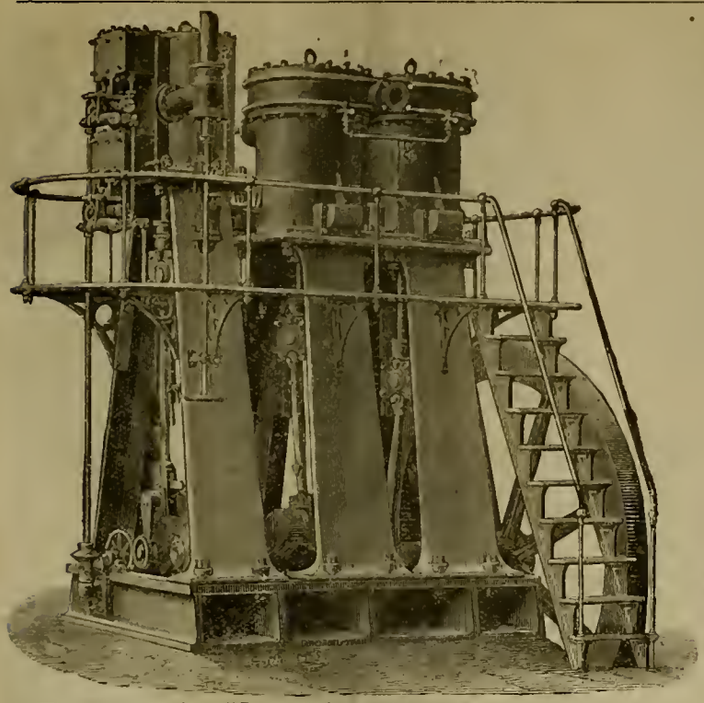

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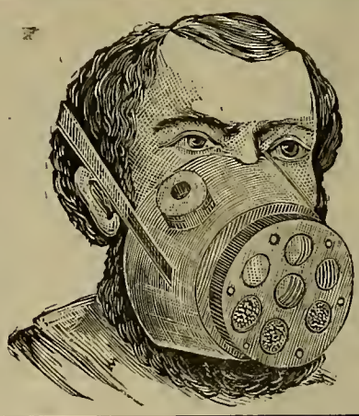

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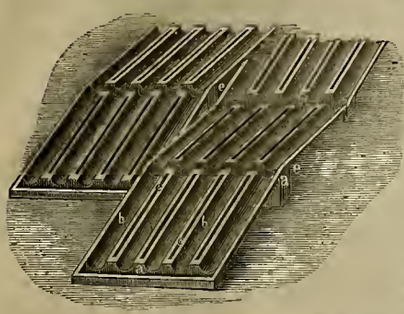

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